

R.A.F. NARRATIVE

(First Draft)

THE AIR DEFENCE OF GREAT BRITAIN

VOLUME IV

THE BEGINNING OF THE FIGHTER OFFENSIVE

1940 - 1941

Air Historical Branch (1)

Air Ministry

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## I N T R O D U C T I O N

This volume, the fourth of a series dealing with the air defence of Great Britain during and immediately before the war of 1939 to 1945, is concerned with events that happened between the close of the battle of Britain and the end of 1941. It does not, however, include an account of the German night offensive of 1940 - 41, which is the subject of the preceding volume.

The plan adopted has been to describe in Part One the development of the air defence system during the period in question and deal in turn with various factors which shaped and contributed to that development.

Parts Two and Three deal with the attack and defence of friendly shipping and of land targets respectively. Parts Four and Five are devoted to the two phases of the daylight offensive, of which the first preceded and the second followed the realization that a German attack on Russia was virtually certain. Finally, Part Six is an account of the tactically offensive operations undertaken during the period by our night fighters.

The table appended to Part Two and histograms appended to Part Three illustrate the character and scope of the German daylight air offensive month-by-month throughout the period and thus have an extended application to the whole volume.

With certain exceptions (noted in the text or indicated in the marginal references), all the statistics relating to friendly and enemy operations which are quoted in the narrative and appendices have been compiled specially for this volume by collating contemporary operational and intelligence reports whose reliability the narrator has, in most cases, been able to assess from personal knowledge of the circumstances in which they were prepared. For the sake of impartiality, reliance has not usually been placed on abstracts or summaries drawn up by staff officers or officials for the purpose of supporting a case. Comparison has, however, been made with such abstracts and summaries where they exist, and in most cases substantial agreement with the figures quoted has been found. Where discrepancies have appeared, attention has been drawn to them in footnotes.

It must be emphasized here that, apart from the specific question of air defence, a good deal of attention was paid during 1940 and 1941 to the evolution of plans for the employment of the metropolitan air force in the event of a German invasion of these islands. Roles were allotted to the various Commands and (particularly after the experience of Crete) measures were taken to safeguard aerodromes against airborne attack. In this connection the reader is referred to the monographs on "Ground Defence and the R.A.F. Regiment" and "Tactical Air Support" which are intended to complement the present narrative. The subject of Air/Sea Rescue, with which Fighter Command was vitally concerned, is also dealt with in a separate monograph.

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PART ONE

THE DEVELOPMENT OF THE AIR DEFENCES

SECRET

I. INTRODUCTORY REVIEW

The battle of Britain is regarded by common consent as having ended on October 31st, 1940. It is true that on the following day the Germans began a fresh series of mass attacks on shipping, in many respects similar to those with which they had opened the battle in July; but the new phase was short-lived and its significance was negative. Within a few weeks it was clear that for the moment the Germans had abandoned their attempt to pulverize Fighter Command by a massive onslaught delivered in daylight.

2. For the moment, then, the main interest passed to the night battle, and the hard-pressed day-fighter force at last gained something of a respite. How long this respite might continue no one, at least on the English side of the Channel, could be sure; the general opinion was that it might last, at the best, about six months. In the spring, or at latest in the early summer, the Germans would, it was thought, return to the attack. Meanwhile they would recruit their strength and digest the lessons of experience. Hence, as soon as the weather once more favoured major operations, the air defences must expect a second onslaught, perhaps more furious, and almost certainly more skilfully delivered, than that which they had just repulsed, triumphantly indeed, but with a difficulty and at a cost of which few, even among the participants, were aware.

3. Thus it was that, although advantage was taken of the lull to begin offensive operations whose object was to wrest the initiative from the Germans and prevent them from maturing their plans without interference, the development of the air defences continued throughout the winter on the assumption that a second battle of Britain would be fought in 1941. The overriding desire of those responsible for the air defences at this stage was to be strong enough to meet

S.3553,  
enc. 63A,  
etc.

FC/S.22332,  
enc. 1A.

/this

this onslaught when it came, and in the meantime find some sort of counter to the German night offensive. Even when spring passed into summer, and there came, instead of the expected onslaught, the German attack on Russia, it was still believed that the issue might be joined before the winter. And indeed, this belief, however unreasonable it may now appear, was based on a correct appreciation of the enemy's intentions; for, as we now know, the Germans themselves hoped for a short campaign, at the end of which they would be free to turn their faces once more to the west. And although by the autumn it was clear that no immediate Russian collapse was likely, the strategic outlook for the Allies was still obscure. Events in the Far East were soon to make it more so. Even as late as the end of the year, then, a renewal of the daylight attack by the Germans in the reasonably near future seemed to all a possible, and to some a probable, contingency.

4. The period from the beginning of November, 1940 until the end of 1941 was therefore spent in enlarging and improving the air defence system as a defensive weapon, in accordance with experience gained in the battle of Britain and with earlier decisions, rather than in deliberately shaping it as the offensive weapon which, to a large extent, it ultimately became. During this period the number of operational fighter Groups grew from five to seven, and the number of fighter Sectors in operation from 23 to 33. The process begun before the fall of France, by which a defensive belt protecting eastern and southern England was converted into a continuous system covering the whole Kingdom, was carried almost to completion. (1) The "filter" and air-raid warning systems were re-organised, partly to conform with these changes, and partly in response to

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/new

(1) See paras. 7 - 32, below.

new requirements. (1) The operational training system was expanded and re-organized by the addition of eight new units to the existing three and the creation of an Operational Training Group to control them. (2) These last changes, although of themselves they did not solve the problem of maintaining the operational squadrons of Fighter Command at their proper strength, (3) enabled the tide of initially-trained pilots and fighter aircraft which flowed in 1941 to be taken at the flood. Thus it was possible between November 1st, 1940 and December 31st, 1941 to raise the strength of the home defence force from 67½ to the equivalent of 105 squadrons, despite the transfer of fourteen Fighter Command squadrons and many pilots overseas. (4) The artillery, searchlight and balloon defences were also substantially strengthened as supplies became available. (5) Finally, the internal organization of the fighter squadrons was altered in consequence of the tactical lessons of the battle of Britain, and on the same grounds, arrangements were made to dispose a number of them so that they could be easily handled in wings of three. (6)

5. All these changes were made with defence rather than offence in view. Even the three-squadron wings, which ultimately proved the mainstay of the fighter offensive, were originally intended for defensive fighting against massed formations. Moreover, it must not be forgotten that in spite of the strategic importance assumed by the daylight offensive after the middle of June, 1941, the main task of Fighter Command <sup>remained even then</sup> ~~was still~~ a defensive one. Although the Germans did not resume their mass attacks in daylight, they undertook operations against shipping which were held to justify the use of fighters for convoy protection on a scale

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- (1) See paras. 33 - 48, below.
  - (2) See paras. 49 - 58, below.
  - (3) See paras. 59 - 65, below.
  - (4) See paras. 66 - 89, below.
  - (5) See paras. 90 - 104, below.
  - (6) See paras. 105 - 115, below.

undreamt of earlier in the war. It is a striking and little-realized fact that, at the height of the Royal Air Force daylight offensive in 1941, the effort devoted by Fighter Command to defensive tasks was still very much greater than that assigned to the offensive. Thus in July the Command flew approximately 6,200 sorties in the course of daylight offensive operations. The number of daylight defensive sorties flown by the Command that month was 9,924, and of these 6,475 were directly concerned with the protection of shipping within 40 miles of the British coast.

6. Before turning, in subsequent Parts to the various operations, offensive and defensive, undertaken by the air defences from the close of the battle of Britain to the end of 1941, it remains to consider these reforms in greater detail.

## II. THE EXPANSION OF THE GROUP AND SECTOR SYSTEM.

### i. The Position at the Close of the Battle of Britain.

7. At the close of the battle of Britain, Fighter Command comprised five operational Fighter Groups, namely :

| <u>Group</u> | <u>Commander</u>                       | <u>Location of Headquarters</u> | <u>No. of Sectors Operational</u> |
|--------------|--|---------------------------------|-----------------------------------|
| No.10        | Air Vice-Marshal<br>Sir C.Q. Brand     | Rudloe,<br>near Bath            | 4                                 |
| No.11        | Air Vice-Marshal<br>K.R. Park          | Uxbridge                        | 7                                 |
| No.12        | Air Vice-Marshal<br>T.L. Leigh-Mallory | Watnall, near<br>Nottingham     | 6                                 |
| No.13        | Air Vice-Marshal<br>R.E. Saul          | Newcastle-on-<br>Tyne           | 4                                 |
| No.14        | Air Vice-Marshal<br>M. Henderson       | Inverness                       | 2                                 |

8. Of these Groups Nos. 11, 12 and 13 had been in operation since the beginning of the war; but No. 10 Group had come into existence during 1940 and had not assumed full control of the area assigned to it until early in August; while No. 14 Group had only recently assumed a similar responsibility for the two northernmost sectors in the United Kingdom.

### ii. Restrospect: the Formation of Nos. 10 and 14 Groups.

9. However, neither of these new Groups was the creation of a day. Even before the fall of France it was clear that the

/flanks

S.3553,  
encl. 1A and  
8A

flanks of a defensive system based on anything short of a continuous line from the Shetlands to Land's End could be turned. Yet the position early in 1940 was that there was no such continuous system west of Portsmouth or north of the Firth of Forth. Beyond these points there were only outposts for the defence of Bristol, the Scottish coast, and Scapa Flow. West of Bristol Fighter Command had not a single aerodrome suitable for modern fighters and radar cover was non-existent or inadequate.

10. The creation of No.10 Group, under the command of Air Vice-Marshal Sir C.Q. Brand, was designed to overcome this weakness so far as the right flank was concerned.

FC/S.15415  
Pts.I and II,  
encl.45B.

Construction of the Group Headquarters at Rudloe began in February, 1940; and in July the Group assumed control of the Pembrey, Filton and St. Eval Sectors, leaving the Middle Wallop Sector still under the control of No.11 Group.

FC/S.15415,  
Pt.III, encl.  
66A - 68A.

During the second week in August control of the Middle Wallop Sector, too, was transferred to the new Group. (1)

Thus by the end of the battle of Britain the resources of No.10 Group comprised four sectors, in which were deployed ten squadrons of single-engined day fighters and one squadron of twin-engined night fighters. There was, however, still a lack of fighter aerodromes in the three more westerly sectors: in none of these sectors was the aerodrome intended to serve ultimately as the permanent sector station ready.

FC/S.15415,  
Pt.III,  
encl.69A, 73A

Moreover, the Filton Sector was inconveniently large. There was clearly a good case for splitting it into two, although for the moment the situation in the Command as a whole made

FC/S.15415,  
Pt.III, encl.  
66A - 68A.

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(1) The opportunity was taken to transfer the Debden Sector from No.12 to No.11 Group, while No.12 Group received the Church Fenton Sector from No.13 Group in compensation. Debden had belonged originally to No.11 Group, but had been reluctantly transferred to No.12 Group in August, 1939, because it was thought that No.11 Group would not be able to handle the new Filton and Middle Wallop Sectors and all its original sectors as well. When No.10 Group took over all the sectors west of Tangmere it at last became possible to adopt an arrangement designed to put the defences of London under one Group Commander and those of the Midlands and South Yorkshire under another.

this step unseasonable.

S.3553,  
encl.1A,8A

Ibid.,  
encl.10A

11. On the left flank of the defensive system, the position at the end of January, 1940 was that north of the Forth there were fighter detachments at Montrose and Dyce, while plans existed to provide aerodromes suitable for modern fighters in Caithness, the Orkneys, and the Shetlands.<sup>(1)</sup> In the light of the experience gained during the first few months of the war, the Air Staff came to the conclusion that something more was needed if adequate security against attack by a growing German bomber force was to be achieved.<sup>(2)</sup> The progress of the Norwegian campaign promised to increase still further the threat to Scotland and Scottish waters; and early in April the Chief of the Air Staff sanctioned a scheme of development which would clearly entail the formation, sooner or later, of a new Fighter Group with its headquarters somewhere in northern Scotland.
12. However, it was not until the beginning of August that the new No.14 Group began to form at Inverness under the Command of Air Vice-Marshal M. Henderson; and not until October that it assumed operational control of its two sectors, Wick and Dyce.
13. Thus at the beginning of November, 1940, Fighter Command comprised 23 Fighter Sectors, organized in five Groups. This was three more sectors than had existed at the beginning of the battle, early in July. Nevertheless much remained to be done before the air defence system could be considered anything like complete.

/ iii.

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- (1) Shortly after this, in February, three squadrons of Hurricanes (Nos.43, 111 and 605) moved to Wick, where a Fighter Sector Headquarters was being opened for the defence of Scapa Flow.
- (2) Apart from the growth of the German bomber force, experience had demonstrated the desirability of increased protection for the Fleet at Scapa Flow and for naval auxiliaries and convoys moving along the east coast of Scotland.

iii. The Formation and Development of No.9 Group

14. The occupation by the Germans of the Atlantic coast of France in the summer of 1940 vastly increased the ability of their Navy and Air Force to strike at shipping in the western approaches to the British Isles. Consequently it was decided that after early July, convoys approaching the United Kingdom from the west should keep well away from the French coast and, instead of going round Cape Clear and through St. George's Channel, should approach the Clyde, the Mersey and the Bristol Channel by way of the North Channel, between Ulster and Scotland. This change would place upon Fighter Command the burden of protecting the convoys against air attack in an area, from the Rhinns of Islay to the Bristol Channel, in which facilities for operating fighters were particularly scanty. Neighbouring objectives on shore had also been made more vulnerable by the defeat of France, and these, too, needed more protection.

S.3553,  
Minute 23

15. It was therefore decided at the end of June that the provision of the additional ground facilities which would be needed to operate fighters effectively in these areas should be put in hand. These were to include new sector stations on the shores of the Solway Firth and the Irish Sea, and also on the banks of the Mersey, in Shropshire, and near Birmingham. In addition, arrangements already in train, which would enable fighters to be based near Belfast, were to be hastened. At the same time, mobile equipment was to be prepared so that, if the opportunity should arise, fighters could be operated from the neighbourhood of Dublin and Wexford at short notice.

Ibid.,  
Min. 25

16. The question that then arose was whether these new sectors should be added to the existing Groups, or a new Group

(1) Apart from the growth of the German bomber force, experience had demonstrated the desirability of increased protection for the Fleet at Scapa Flow and for naval auxiliaries and convoys moving along the east coast of Scotland.

created to assume command of some or all of them. A glance at the map is enough to show that the case for a new Group was a strong one. It was obvious, for example, that No.12 Group would benefit enormously from the presence of a new Group at its back, which would enable it to concentrate on defending its area against attack from the east or round its northern or southern flanks, without having continually to look over its shoulder. Similarly, No.10 Group, which was shortly to assume responsibility for all the sectors in its area, was in no position to undertake a further major extension of its commitment.

17. Accordingly, the nucleus of No.9 Group began to form at Preston early in August, 1940. On September 16th its first Air Officer Commanding, Air Vice-Marshal W.A. McCloughry, took up his appointment. By this time it had been decided that the new sectors to be allotted to the Group should be four in number. One, with its headquarters in the Isle of Man, would cover the southern approaches to the North Channel; a second would defend industrial Lancashire and the Mersey; and the other two would cover the west Midlands, Wales, and parts of the Irish Sea.

18. Unlike Nos. 10 and 12 Groups, No.13 Group was in a position to undertake new commitments, since its responsibilities had recently been reduced by the creation of No.14 Group and the transfer of the Church Fenton Sector to No.12 Group. To No.13 Group, therefore, would go the new sectors in northern Ireland and southern Scotland. The latter would look westwards, relieving the Turnhouse Sector of responsibility for the Clyde.

19. This considerable extension of the air defence system could not be effected in a day. In July No.245 Squadron moved to Aldergrove, in Ulster. There was already a squadron at Prestwick, then still in the Turnhouse Sector. Thus some degree of fighter protection for Belfast, the Clyde and the North Channel

/was

FC/S.18993  
Pt.II, encl.  
1A.

No.245 Sqdn.  
Form 540.

S.6717,  
passim

was assured. But further south a lack of aerodromes and other facilities made progress very slow. Early in October, two months after No.9 Group had begun to form, the new Group was still far from being operational. Radar cover in the west had been installed on a temporary basis, but there was still a serious gap in Cardigan Bay; and the communications which would be needed before the Observer Corps system could function were nothing like complete. It had not yet been decided which aerodromes would serve as sector stations and which as satellites or forward bases; and in the two southern sectors, where facilities were urgently required for the night defence of Coventry and Birmingham, not one of the aerodromes from which the choice was to be made was ready. Such local fighter defences as were available for these cities and for Liverpool were still being provided by No.12 Group, which had units at Ternhill, Ringway, and Speke.

H.Q.F.C. Order  
of Battle d.  
6.10.40.

20. From the middle of October onwards a special effort was made to get No.9 Group on its feet. <sup>(1)</sup> The installation of communications was hastened; and the original scheme was modified in some respects so as to make its accomplishment easier.

S.6717,  
passim

21. In consequence of these efforts, on December 1st No.9 Group was able to assume control of the Speke and Ternhill Sectors. The first of these took care of industrial Lancashire and the Mersey; the second covered the northern part of the west Midlands and extended westwards over North Wales and Anglesey. The Jurby (Andreas) Sector, covering the Isle of Man and the southern approaches to the North Channel, followed a few days later. Operational control of the remaining sector in the Group (known at first as Baginton and later as Honiley), which covered part of the west Midlands and extended westwards over central Wales and

H.Q.F.C. &  
No.9 Group,  
Forms 540.

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(1) German attacks on west coast towns had called attention to the urgency of the matter.

Cardigan Bay, remained with No.12 Group until the middle of March, 1941, when No.9 Group assumed responsibility for the activities of this sector in daylight. For the time being No.12 Group remained responsible for its defence after dark, in accordance with a scheme for mutual assistance between Nos.9 and 12 Groups for the night defence of the Midlands.

22. In practice the long, narrow Baginton and Tornhill Sectors soon proved inconvenient. It was, therefore, decided that a fifth sector should be formed in No.9 Group, with its headquarters in Anglesey and extending over North Wales and adjacent waters. Thus Baginton and Ternhill would become inland sectors, responsible for defending the industrial areas round Birmingham, Wolverhampton, Coventry, Stoke and Crewe; while the new sector would protect shipping in the Irish Sea and deal with enemy aircraft approaching the Mersey by the seaward route. This new sector, known at first as Rhosneigr and later as Valley, began to operate on April 1st, 1941.

FC/S.22669,  
passim

iv. The Formation of No.82 Group

23. The arrangement which put the new sector in Ulster under the operational control of No.13 Group lasted only about a year. This sector had been planned before the war; and the provision of the necessary facilities, on a more generous scale than had then been contemplated was put in hand during the summer of 1940. At that time it was supposed that political conditions might, within a reasonable time, allow of the creation of at least two sectors in Eire as well; and it was proposed that the sectors in Eire and Ulster should together form a Fighter Group within Fighter Command. In the meantime, the situation created by the fall of France made it necessary to look to the defences of northern Ireland and the North Channel without delay. When No.245 Squadron moved to Aldergrove in July, control of that squadron and sector were assigned for the time being to No.13 Group, on the understanding that, should Eire be invaded, it would pass to the Air Officer Commanding, Royal Air Force in

FC/S.20349,  
encl. 15B

Ibid.,  
Encl. 9A.

Ibid.,  
encl. 42A

/Northern

Northern Ireland, who was responsible for planning operations in support of the Army. This officer would then operate the fighters on behalf of the Air Officer Commanding-in-Chief, Fighter Command. At the same time, three more fighter squadrons were earmarked for transfer to Ireland in an emergency and these, too, would then come under his command. (1)

24, It was further provided that, if these circumstances should arise, the four fighter squadrons in Ireland would be organized in two mobile wings, each of two squadrons. In due course the projected "Irish Group" - which had been shelved for the moment - would form at Belfast, from which base it would plan the air defence of Eire. When conditions permitted, it would move to Dublin. The ultimate scale of air defence for Ireland, as approved by the Chiefs of Staff Committee on November 29th, 1940, would include eight sector stations (including the one already established in Ulster), 288 heavy and 318 light A.A. guns, 312 search-lights and 180 balloons. Whether in fact the circumstances which would enable these defences to be deployed would ever arise was problematical; but planning proceeded on the assumption that they might do so in March, 1941.

FC/S.20349,  
encl. 82B

25. During the spring and summer of 1941, the whole problem was modified by the operation of two important factors. In the first place, the circumstances which would have made it possible for British forces to be deployed in Eire did not materialize, and the possibility that they might do so in the future became more and more remote.

S.1562,  
encl. 136A.

Secondly, it was decided that certain naval anchorages in

FC/S.20349  
encl. 17A, 26A

Ibid.,  
encl. 54A

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(1) The squadrons selected were Nos. 501, 257 and 17. Later the quickened tempo of operations made it difficult to earmark particular squadrons and it was foreseen that the three reinforcement squadrons might have to be chosen at the last moment.

Northern

Northern Ireland should be placed at the disposal of the United States Chiefs of Staff in connection with the Battle of the Atlantic. An increased scale of anti-aircraft artillery defence was required for these naval bases; and it was decided that the number of Fighter Sectors in Northern Ireland should be increased to three and that they should form a separate Fighter Group with its headquarters in Ulster. In July Air Commodore G.M.Lawson was appointed to command this Group, which was known as No.82 Group; and on September 25th operational control of the air defences in Ulster, including the St.Angelo, Ballyhalbert (formerly Aldergrove) and Eglinton Sectors, was transferred from the Air Officer Commanding No.13 Group to him. (1)

v. Further Developments in 1941.

26. With the expansion of the air defence system to cover the whole of England and Wales, northern Ireland, and the greater part of Scotland, something approaching the practical limit of development was reached. Such further changes as occurred in 1941 were mostly of local interest. An example was the erection of Exeter, formerly part of the Filton (or Colerne) Sector, into an independent sector. This division had been suggested in August

FC/S.15415,  
Pt.3, encl.  
80A, 96A.

FC/S.20289,  
encl. 92B -  
102A.

- (1) This change led to some doubt whether, if Ireland were invaded, responsibility for the air defence of Ulster would pass to the Air Officer Commanding, Royal Air Force, Northern Ireland, or remain with No.82 Group. The problem was complicated by a decision, based on the reduced risk of invasion during the winter, temporarily to reduce the resources of the former Command; and by the entry of the United States into the war, which made it difficult to foresee the future situation in Northern Ireland. For some weeks, therefore, the point remained unsolved; but early in 1942 the Air Staff settled it by ruling that the fighter squadrons in Ulster formed an integral part of the air defence system and that the Air Officer Commanding-in-Chief, Fighter Command alone could decide what proportion of them might be spared to support the movement of an Army. On the other hand, any squadrons sent to Ireland as re-inforcements in the event of invasion would be sent for the express purpose of supporting the Army, and should therefore go, not to No.82 Group, but to the Air Officer Commanding, Royal Air Force in Northern Ireland or his successor in the command of the air forces working with the Army.

August, 1940, and was effected early in 1941. By the following Spring the opening of new aerodromes in the south-west, the extension of radar facilities, and an all-round deepening of No.10 Group's resources had greatly strengthened the right flank of the air defences. As for the system as a whole, a measure of the progress made during the autumn and winter of 1940-41 is that at the end of the battle of Britain there were 23 Fighter Sectors, while at the beginning of April, 1941, there were 29. During these five months the number of operational Groups had risen from five to six; and a seventh was to be added in the course of the next half-year. A tentative plan drawn up in 1940 had made provision for 33 sectors to cover England, Scotland, Wales and Ulster, and a further seven to cover Eire. <sup>(1)</sup> By the end of the first week in April 1941 all but five of the sectors required by the first part of this scheme were in existence, and a further sector in Wales, not envisaged in the plan, had been added. The five missing sectors were Ayr or Prestwick, Tain, Sumburgh, Stornoway and Oban. Prestwick was on the point of becoming operational; but Tain was not to do so until early in October. In the case of Sumburgh, it was found impracticable to provide the communications which would have been needed for a separate sector station in the Shetlands. Sumburgh aerodrome therefore remained in Coastal Command; and fighter defence for the islands was provided when necessary by lodging there a detachment from Kirkwall on a "sub-sector" basis.

S.3553,  
encl. 39B

27. Stornoway and Oban were in a different category. Towards the end of 1940 the Air Staff came to the conclusion that an extension of the air defence system to the north-west was desirable. The objectives in this area for which protection was required included ocean shipping in the north-west

S.7798,  
encl. 12A.

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(1) See appendix (I) A.

Ibid.,  
encl. 22A, 23A.

west approaches; shipping in the Minches and northabout; naval bases at Oban, Loch Ewe, and Kyle of Lochalsh; an aluminium factory in the Highlands; and aerodromes in the Hebrides and Islay which were to be used by Coastal Command. The Air Staff view was that the protection of all these objectives, except the first, was a function of the air defences. The Air Officer Commanding-in-Chief, Fighter Command and his staff were inclined to think that the whole responsibility for these distant areas, whose geography was unfavourable to the close control of fighter aircraft, would be better undertaken by Coastal Command.

Ibid.,  
encl. 23A, 33A.

28. However, the Air Staff view prevailed, and in January, 1941, plans were made for the formation of two new Fighter Sectors. One would have its headquarters at Stornoway and a forward aerodrome on the island of Benbecula; the other was to have its headquarters somewhere near Oban and a forward aerodrome on the Isle of Tiree. The aerodromes in the Hebrides would remain in Coastal Command, and any units of Fighter Command which might be based there would be "lodger" units. On the other hand the new aerodrome to be established near Oban would be in Fighter Command.

Ibid.,  
encl. 36A

29. In practice it proved impossible to find a site suitable for a sector station anywhere near Oban. It was therefore decided in February that the more southerly of the two new sectors should have its headquarters on the Isle of Tiree but that every attempt should be made to find at least an emergency landing-ground on the mainland. (1) As a corollary to these arrangements, the Admiralty were asked to allow their aerodrome at Machrihanish, (2) in Kintyre, to be used as a forward aerodrome in the Ayr or Prestwick Sector of No.13 Group. This would ease the problem of protecting

Ibid.,  
encl. 48C

- (1) Eventually a site for an emergency landing-ground was found at Connell, five miles north-east of Oban.  
(2) Alternatively named Strabane.

protecting shipping in the North Channel, a little further to the south.

Ibid.,  
encl. 33A,  
40A.

30. Fighter Command were also anxious to have an aerodrome on the mainland in the more northerly sector; but again no suitable site could be discovered.

Ibid.,  
encl. 59A-63A.

31. This lack of good aerodromes on the mainland meant that it would be difficult, if not impossible, for the Hebridean sectors to operate short-range fighters effectively over the whole of the areas assigned to them. Fighter Command therefore proposed that long-range fighters such as Beaufighters or Bostons, should be used instead. The Air Ministry approved this proposal in April, 1941; but in June, as a result of discussions between Fighter and Coastal Commands, a modified scheme was adopted. Under this scheme the two long-range fighter squadrons which were considered necessary would be provided by Coastal Command, <sup>(1)</sup> but operated by Fighter Command when used for controlled interception; while Fighter Command would base one short-range fighter squadron of its own in each sector to cover the area stretching eastwards from Tiree and Stornoway over the Minches and the mainland. Subsequently this programme was again modified, and it was not until early in 1942 that its details were settled. Throughout 1941, therefore, the Hebridean sectors enjoyed no more than a shadowy and hypothetical existence. <sup>(2)</sup>

Ibid.,  
encl. 133A.

Ibid.,  
encl. 159A

Ibid.,  
encl. 185A -  
188A.

FC/S.27908,  
enc. d. 3.9.42.

FC/S.24244,  
encl. 143A.

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- /32.
- (1) It was intended that Coastal Command should eventually have eight long-range fighter squadrons, of which two would be based in Northern Ireland and one each at Tiree, Stornoway, Sumburgh, Dyce, Thornaby and St. Eval. To gain experience in the meantime, Sections of Nos. 143 and 248 Squadrons would operate under Fighter Command control from Sumburgh and St. Eval.
- (2) The subsequent history of these Sectors was equally negative; for by the time they were ready to operate they had become practically redundant. In September, 1942 the Commander-in-Chief expressed the view that to maintain Fighter Operations Room at Stornoway and Tiree was a waste of effort, adding, "I have never put any fighters at these two aerodromes, and I do not propose to do so." Nevertheless it was not until the middle of February, 1943 that the Operations Room at Tiree closed down, while that at Stornoway continued to function on a "skeleton" basis until May, 1944.

32. Thus the Hebrides, the western Highlands and the Minches remained outside the shelter of the Fighter Command umbrella, which now extended its protection over every other part of the United Kingdom. By the Spring of 1941 a defensive system designed in 1923 to protect London and the industrial Midlands against attack from the south or south-east, and re-orientated in 1935 with the object of protecting London, Portsmouth, the Midlands, Tyneside and industrial Lancashire and Yorkshire against attack from Germany or the Low Countries, had been expanded so that fighter aircraft could now be operated and closely controlled over every part of the United Kingdom, excepting this one corner.

### III. THE MODIFICATION OF THE FILTER AND AIR RAID WARNING SYSTEMS

#### i. The Decentralisation of Filtering: Policy

33. The operation known as filtering has been defined as

FC/S.21133,  
enc. d.8.10.40.

"receiving from R.D.F. (radar) Stations individual plots (which are too numerous and intrinsically inaccurate to be 'told' to operations tables) and producing therefrom a connected track suitable for onward transmission. During this process an identification of the track is made . . . and the track is given a number or letter by which it is known throughout the remainder of its course."

S.D.364,  
para, 121

34. Originally this process was carried out exclusively at the headquarters of Fighter Command at Starmore, in a room known as the Filter Room, whence the filtered formation was 'told' to the Command Operations Room close by and also directly to the operations rooms of the Sectors and Group or Groups concerned. But in 1940 the extension of the air defence system to remote parts of the Kingdom made it impracticable to connect all the radar stations by telephone with the Command Filter Room, and consequently separate Filter Rooms were established in western and north-western England and the north of Scotland. (1) As

(1) The Western Filter Room opened in temporary premises at Plymouth on June 23rd, 1940 and moved to the headquarters of No.10 Group at Rudloe on July 30th. The North Western Filter Room opened on August 13th, 1940 at Preston, in premises which were to become the headquarters of No.9 Group. In the extreme north of Scotland, filtering for the Wick or Kirkwall Sector was done first at Wick and after September 25th, 1940, at Kirkwall in the Orkneys. /these

these worked reasonably well, it was asked whether each Fighter Group should not be given its own Filter Room.

S.3377,  
passim

A.H.B.ID/2/183  
and S.6287,  
passim

35. This suggestion was not new. It has been considered and rejected twice in 1939, and was made for a third time early in 1940. On this occasion it obtained considerable support from members of the Air Staff; but the Air Officer Commanding-in-Chief opposed it so vehemently and with such a wealth of argument that the idea was allowed to drop before it reached the stage of official doctrine. In the autumn of 1940 the matter was raised yet again by a committee appointed under the chairmanship of Marshal of the Royal Air Force Sir John Salmond to examine the problem of night offence. This time the proposal received additional support because it was believed that in the near future the installation in all British aircraft operating over the sea of the identification device known as I.F.F. would weaken one of the strongest arguments for a central filter room in which information about the movements of friendly aircraft could be collated and applied. (1) On this occasion, therefore, the Air Staff decided on decentralisation, largely because they believed that it would substantially reduce the interval between the first detection of an approaching raid and the despatch of aircraft to intercept it.

Ibid.

36. This belief was founded on a misconception. It was supposed that decentralisation would save one step in the 'telling' process; but this was not so. Filtering could not be done in the Operations Rooms themselves; and the time taken to 'tell' a plot was the same whether the Filter Room was next door or a hundred miles away. There were,

however,

S.7544/I,  
encl. 5A.

S.D.564,  
paras.104-118

(1) This belief was over-sanguine. The practical shortcomings of I.F.F. were underestimated. Largely because of this factor, correct identification continued until the end of the war to depend ultimately on the judgement of officers in Filter Rooms and the adequacy of the information about aircraft movements with which they were supplied.

however, other arguments in favour of decentralisation, of which the strongest were that it would obviate congestion of the Filter Room at Starmore, which otherwise might become dangerous as the number of radar stations grew, and that it would diminish the risk that the enemy might paralyze the whole of air defence system from the Forth to the Isle of Wight at one blow. (1)

37. Nevertheless, the Air Officer Commanding-in-Chief, Fighter Command was strongly opposed to decentralisation. He believed that, on balance, it would confer no advantage which could justify its costs in money and effort. When the measures adopted in consequence of the Salmond Report were discussed at a meeting under the chairmanship of the Minister of Defence, on October 7th, 1940, he indicated his dissent from this proposal, and the matter was referred back to the Air Ministry for further consideration. After some weeks of discussion it became clear that the decision taken by the Air Staff had been based largely on a misunderstanding of the "telling" process. The validity of the arguments regarding congestion and the risk of a knock-out blow was, however, unaffected by this discovery; and after lengthy debate, the decision to decentralise was upheld.

Ibid.

ii. The Decentralisation of Filtering: Method.

38. The intention to decentralise having been confirmed it remained to choose between two possible decentralised systems. Under one system, filtered tracks would be told simultaneously to all the Operations Rooms concerned, including that at Command Headquarters. So long as the problem of identification at Group level could be solved, this would mean that the Command Operations Room would get its information as quickly as under the centralised system and could continue, if

/required

S.3377,  
min. 9,  
encl. 9A.

- (1) Safeguards against this contingency existed under the centralised scheme; but there was some doubt about their adequacy.

required, to issue air raid warnings without loss of efficiency.

39. The other possible system was to tell filtered tracks to the Command Operations Room, not directly from the Filter Rooms at the various Groups, but from the Group Operations Rooms. Should the Command Operations Room continue to issue air raid warnings in these circumstances, there was a risk of dangerous delay in the case of districts bordering the coast. Should this system be adopted, therefore, it would be logical to decentralise the air raid warning system as well. If this process was carried to completion, Command Headquarters would virtually cease to have any operational function, and become a mere co-ordinating body.

40. Clearly, the implications of these two systems were very different. Nevertheless, when the decision to decentralise was made, there seems to have been some confusion as to which system it was intended to embrace.

A.H.B.ID/2/183;  
S.3377, enc.3A

iii. The Decentralisation of the Air Raid Warning System: Policy

41. However, recent events in another field had an important bearing on this point. It happened that in 1940 H.M. Government were anxious to find a way of increasing the amount of lighting in the streets during the coming winter, without undue risk. A committee appointed under the chairmanship of Mr. A.N. Rucker of the Ministry of Home Security to investigate this problem came to the conclusion that everything turned upon the speed with which warning of the approach of enemy aircraft could be given to those who would have to operate the lights. They therefore recommended that the air raid warning system be reviewed. Accordingly a fresh committee, of which the Air Officer Commanding-in-Chief and Chief Air Raid Warning Officer, Fighter Command were members, was appointed for this purpose. Early in October, 1940 a majority of this committee came to the conclusion that a radical change in the method of issuing air raid warnings was

A.H.B.ID/5,  
item 6.

Ibid.,  
Item 8.

due. The Air Officer Commanding-in-Chief, Fighter Command, dissented. The Committee then issued a report, in which they advised that, as an experiment, the issue and cancellation of warnings should be decentralised to Group Headquarters in the case of Nos. 9 and 10 Groups. <sup>(1)</sup> They added that the arguments in favour of universal decentralisation would be strengthened "if the recent decision ... to provide separate Filter Rooms at Fighter Group Headquarters were to be ratified".

iv. The Decentralisation of the Filter & Air Raid Warning Systems: Practice

42. This argument could be turned round the other way; and once the substance of the Committee's report had been accepted by the War Cabinet, as it was on October 14th, the decentralisation of both filtering and the air raid warning system throughout Fighter Command was practically a foregone conclusion. True, the War Cabinet had committed itself only to an experimental decentralisation of the air raid warning system to Nos. 9 and 10 Groups. But if air raid warnings were to be issued and cancelled from the Operations Rooms of Groups, then those Operations Rooms must be equipped for the purpose; and this could be done much more easily while they were being built than after they were finished. Moreover, the Committee had said that if the decision to provide separate Filter Rooms at Groups were ratified, the case for universal decentralisation of the air raid warning system would be stronger. That decision had now been ratified. In these circumstances there was little likelihood that the War Cabinet would refuse to sanction further measures of decentralisation, unless, indeed, the example of Nos. 9 and 10 Groups should prove disastrous.

43. In December, 1940, therefore, orders were given for the Operations Room at No.12 Group's headquarters to be modified

(1) In view of subsequent developments, it is interesting to note that the issue and cancellation of warnings from Observer Corps-Centres was discussed but rejected, largely because it was considered impracticable to provide the necessary communications.

S.6972,  
enc. 3A,  
Appx. "A".

S.6972,  
encl. 32A,  
Min. 33.

modified so that air raid warnings could be issued and cancelled from it if necessary; for the possibility of making similar changes at No.13 Group to be explored; and for the permanent Operations Rooms which were to replace the existing temporary premises at Nos. 9, 10 and 14 Groups to be designed from the outset with this requirement in view. It was also suggested that Headquarters, Fighter Command might move to Harrow so as to give No.11 Group the benefit of its Operations Room and Filter Room at Starmore. The Commander-in-Chief opposed this suggestion so strongly, however, that it was not pursued.

44. Arrangements for air raid warnings to be issued and cancelled from the headquarters of Nos. 9 and 10 Groups were completed by the middle of February, 1941 and were then put into effect. At the beginning of May the War Cabinet sanctioned the extension of decentralisation to the other Groups, and in the course of the summer Nos. 12, 13 and 14 Groups took over these duties. In addition an Air Raid Warning Staff was established in northern Ireland, where No. 82 Group was to go into operation in the autumn. Warnings and cancellations in respect of No.11 Group's area continued to be given from Headquarters, Fighter Command, which also continued to exercise a measure of minute-to-minute supervision over the system as a whole.

S.6972,  
encl.101C.

FC/S.23539,  
passim.

Ibid.,  
min. 114.

45. The decentralisation of the filtering system proved a longer and more complicated process. At the headquarters of Nos. 9 and 10 Groups there were already filter rooms; but at Nos. 12, 13 and 14 Groups it was necessary to bridge the gap until permanent filter rooms could be completed, by finding and equipping temporary premises. This took longer than was expected; and before these premises were ready, the operation of a new factor led to the desirability of decentralisation being called in question once again. This new factor

S.7544/I and  
II, passim

/arose

S.6972,  
encl. 101G.

arose out of a decision to make certain reductions in the establishment of headquarters formations for reasons of economy. The Air Officer Commanding-in-Chief, Fighter Command suggested early in May, 1941 that if the twin process of decentralising the filtering and air raid warning systems were arrested substantial economies in personnel might be achieved. His predecessor had strongly opposed decentralisation and he himself would be quite content to retain the existing organization.

46. The question was therefore considered afresh by the Air Staff. It was found that the arguments for decentralisation, which had been advanced in the previous autumn, still held good; while recent developments provided further reasons why decentralisation should not stop. (1) Moreover, it seemed unlikely that the saving in personnel which could be achieved in this way would be as great as the Commander-in-Chief supposed. It was therefore decided in the middle of May that decentralisation should continue. (2)

Ibid.,  
encl. 101A  
and B

47. Accordingly, the filter room at Headquarters, No.12 Group went into operation on May 22nd, 1941. That at Headquarters, No.13 Group followed on September 3rd and that at Headquarters, No.14 Group on October 21st. A filter room opened at the headquarters of No. 82 Group in Northern Ireland on September 25th. (3)

S.7544/I,  
encl.81A

S.7544/II,  
encl.4A

H.Q.F.C.(Sigs) Form 540.

48. On the completion of the decentralisation scheme filtering for No.11 Group's area continued to be done at Starnmore, and in due course the Command filter room became No. 11 Group filter room, although it remained throughout the war at or near Headquarters, Fighter Command.

S.D.564,  
para. 121.

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- (1) The Regional Control System, the Air Sea Rescue Service and the W.T. standby system were all being developed with a decentralised filter and air raid warning system in view.
  - (2) Whether this issue caused any delay is doubtful. Shortly after it first arose, Fighter Command announced that work on the filter rooms would not be held up while it was being discussed. But before this, progress had been slow as to give rise to the suspicion that it would have been faster if support for the measure had been unanimous.
  - (3) This coincided with the assumption of operational control by the Group.

S.6972,  
encl.101A.

S.7544/I,  
min. 79

Ibid.,  
encl. 19A  
76A.

#### IV. THE EXPANSION OF THE OPERATIONAL TRAINING SYSTEM

##### i. Deficiencies during the Battle of Britain

Dowding,  
Despatch,  
para. 193.

49. In his despatch on the battle of Britain, Air Chief Marshal Dowding, who was then in command of the air defences, has testified that in August, 1940 "the effective strength of Fighter Command was running down".

Ibid.,  
para. 184

50. What was the reason for this? The immediate cause was that the output from the Operational Training Units which supplied pilots to the operational squadrons was insufficient to meet the losses suffered in the battle. From this some critics have concluded that the fault lay with the size of the Operational Training Organization and have blamed Air Chief Marshal Dowding for opposing the expansion of that organization in 1939. But this argument rests upon a fallacy. It is, of course, quite true that, all else being equal, a larger "reservoir" of trained pilots in the Operational Training Units would have postponed the effective weakening of the Command. But such a "reservoir" could only have been accumulated in the first place either by withholding pilots from operational squadrons or by increasing the supply from the Flying Training Schools. To withhold pilots from the operational squadrons was not a policy which would have been likely to find many advocates in 1939 or 1940, when the situation facing the air defences was always serious and sometimes critical. To increase the supply from the Flying Training Schools at short notice was impossible, since the schools could not even meet existing requirements. In short, the "bottleneck" was the restricted capacity of the Flying Training Schools and could have been avoided only by long-term measures which it was not within the competence of Fighter Command or its commander to initiate.

Ibid.,

##### ii. The Origin of the Fighter O.T.U.'s

51. Nevertheless it is quite true that in 1939 Air Chief Marshal Dowding was opposed, on grounds of expediency,

/though

S.2116,  
encl. 1A,  
11A, 13A.

though not of principle, to the formation of the "Group Pools" out of which the Operational Training Units grew. Grudging the diversion of resources which might be used to form new first-line units, he would have preferred to do the necessary operational training for home defence in the squadrons themselves.

S.1924,  
passim

He admitted, however, that squadrons overseas might not be able to give much time to training and that a pool might be needed for this purpose. The outcome was that when the war broke out

A.H.B.Narrative, No.11 Group was allowed to keep its pool at St. Athan, which was "Training: Policy and Organization".

already in existence, having opened at Andover in the previous January, and that a pool for No.12 Group was formed at Aston Down in September 1939 and began to function on a limited basis towards the end of the year. (1)

52. With the assistance of a short-lived Blenheim Conversion Flight at Hendon, these two units were expected to supply the needs of the whole of Fighter Command and the fighter squadrons on the Continent, so that the name Group Pool was something of a misnomer. Their combined output was estimated early in 1940 at 44 pilots a month.

iii. Expansion in 1940 and 1941

53. During the greater part of 1940 these units struggled against difficulties which included grave shortages of equipment. It was natural that Fighter Command should be blamed for this situation; but in the circumstances these troubles were doubtless inevitable. So long as there was a lack of materials needed by both operational squadrons and units responsible only for training, it was natural that the operational squadrons should get the preference.

54. As time went on these difficulties began to be overcome. By the end of the battle of Britain the number of units had been increased to three and the name "Group Pool" had given way to the more appropriate "Operational Training Unit". Moreover, orders had been given for the formation of a fourth

FC/S.20569,  
encl. 95A

Ibid.,  
encl. 131A.

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(1) It was to have opened during the summer, but its opening had been postponed. /Operational

Operational Training Unit, which would specialize in training crews for night interception.

55. At this stage, then, Fighter Command could look forward to the possession of a much larger training organization than had existed in 1940. It was hoped that the combined output of the four O.T.U.'s would amount to some 60 pilots a week, which was about five times the rate at which the organization had been able to turn them out ten months before. Nevertheless, supply still lagged behind demand. With the fall of France, demands from the Continent had ceased, but fighter pilots were badly wanted in the Middle East, and the expansion of Flying Training Command meant a further call on Fighter Command to supply pilots as instructors. Wastage from all causes, including postings to other Commands, averaged 58 a week in October, 1940. During the first few days of November Fighter Command found itself called upon to supply more than 100 pilots to the Middle East alone, although its own strength was already below establishment. It was obvious that even the expanded organization would not be able to make good such a drain as this. Shortly before leaving the Command, therefore, Air Chief Marshal Dowding asked the Air Ministry to sanction the formation of two more O.T.U.'s. He also suggested that all the Fighter O.T.U.'s should be incorporated in an operational Training Group within his Command.

Ibid.,  
min. 126.

Ibid.,  
encl. 131A.

56. The sequel was the formation, in December, 1940, of No.81 Group, under the command of Air Commodore F.J. Vincent. On the last day of the year the new Group took over from Nos.10, 12 and 13 Groups control of the six O.T.U.s which were already at work or being formed.

H.Q.  
No.81 Group  
Form 540

These were :

Day O.T.U.'s

No.55, Aston Down  
" 56, Sutton Bridge  
" 57, Hawarden  
" 58, Grangemouth  
" 59, Turnhouse

Night O.T.U.

No.54, Church Fenton

57.

On February 18th, 1941 two more O.T.U.'s began to form, No.52 at Debden and No.53 at Heston, while on April 25th a second night O.T.U. was added, when No.60 O.T.U. began to form at Leconfield. In May a scheme for the ultimate organization of the Group on the basis of three night and eight day O.T.U.'s was adopted, the details being as follows :-

| <u>Unit &amp; Function</u> | <u>Base on 28.5.41.</u>        | <u>Ultimate Base</u> | <u>Remarks</u>  |
|----------------------------|--------------------------------|----------------------|---|
| No.51 O.T.U. (Night)       | -                              | Cranfield            | To form c. 1.8.41.  |
| No.54 O.T.U. (Night)       | Church Fenton                  | Charter Hall         | To move c. 15.8.41.   |
| No.60 O.T.U. (Night)       | Leconfield                     | East Fortune         | To move at once   |
| No.52 O.T.U. (Day)         | Debden                         | Aston Down           | To move c. 15.7.41.   |
| No.53 O.T.U. (Day)         | Heston                         | Llandlow             | Half to move shortly. Other half to remain as nucleus of No.61 O.T.U. |
| No.55 O.T.U. (Day)         | Usworth (Moved 15.3.41)        | Annandale            | To move c. 1.9.41.  |
| No.56 O.T.U.               | Sutton Bridge                  | Kinnell              | To move c. 1.9.41.  |
| No.57 O.T.U. (Day)         | Hawarden                       | Hawarden             | -   |
| No.58 O.T.U. (Day)         | Grangemouth                    | Grangemouth          | -   |
| No.59 O.T.U. (Day)         | Crosby-on-Eden (moved 26.2.41) | Crosby-on-Eden       | -   |
| No.61 O.T.U. (Day)         | -                              | Heston               | To form shortly on nucleus of No.53 O.T.U.                            |

58.

Except that Nos. 54, 55 and 56 O.T.U.'s remained at their old bases, (1) this scheme was carried out approximately as

H.Q. No.81

Group Form 540; planned, so that by the end of 1941 the Fighter Operational precis of his-  
tory of O.T.U.'s Training Organization had grown from the infant of 1940 with its

Precis of history of O.T.U.'s by No.12 Group

two Group Pools and output of 44 pilots a month, into an adult comprising eleven Operational Training Units and a Group Headquarters. During 1941 the O.T.U.'s did 263,604 hours' flying and turned out 4,242 pilots - an average of more than 350 a month.

/ v.

(1) Their transfer to their new bases was postponed until the Spring of 1942, when the moves took place as planned, except that Tealing replaced Kinnell as the main base of No.56 O.T.U., Kinnell becoming a satellite.

## V. THE PILOT STRENGTH OF FIGHTER COMMAND

### i. The Position at the Close of the Battle of Britain

59. Although the expansion of the Operational Training Organisation had already begun when the battle of Britain ended, the strength of Fighter Command in terms of pilots continued long after this to be far from satisfactory. On October 31st, 1940 the number of pilots in the 66 $\frac{1}{2}$  squadrons of the Command was 1,506, of whom 464 were regarded as "non-operational".<sup>(1)</sup> This was an overall average of 22.6 pilots a squadron. At this time the nominal establishment of a fighter squadron stood at 26 pilots. Heavy calls were already being made on Fighter Command to supply pilots for other Commands. It was quite clear that in these circumstances there was little prospect that the theoretical establishment would be achieved within a measurable time.

FC/S.20569,  
encl.131A,  
125A

### ii. Developments during the Winter and Spring of 1940-41

60. It was agreed, therefore, towards the end of 1940 that the establishment of a fighter squadron should be reduced to 23 pilots; but even to maintain the strength at this figure during the winter and spring of 1940-41 proved beyond the capacity of the training organization. The supply of new pilots failed to keep pace with the expansion of the Command which was then in progress, coming on top of the drain caused by normal wastage and postings to other Commands.<sup>(2)</sup> By the beginning of January, 1941

FC/S.23836,  
encl. 1A.

FC/S.20569,  
enc. d.7.1.41.

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(1) There were in fact 67 $\frac{1}{2}$  Squadrons formed and forming, but this figure included No.71 (Eagle) Squadron, which the authority here cited seems to have excluded.

(2) Between November 1st, 1940 and March 31st, 1941, Fighter Command lost 219 pilots killed or missing in consequence of accident or combat; 382 were posted away, of whom 123 went overseas and 135 to Flying Training Command. The figure of 382 includes pilots posted from squadrons to the O.T.U.s as instructors.

the overall strength had fallen to an average of about 21 pilots a squadron, at which figure it remained for the next three months; and as the flow of pilots from Flying Training Command to No.81 Group often fell short of requirements, the future looked far from reassuring. On April 14th, for example, only 35 pilots were received from the Flying Training Schools, against a requirement of 245.

FC/S.23836,  
encl. 1A.

61. In the middle of April, therefore, the Air Officer Commanding-in-Chief, Fighter Command protested to the Chief of the Air Staff and the Air Member for Personnel against an alleged tendency among their subordinates to regard the claims of his Command too lightly. The attitude of the Air Ministry, he said, was that Fighter Command was "quite all right". In fact, he submitted, the Command was not "quite all right": it was dangerously weak. If it was the deliberate policy of the Air Ministry to allow this weakness to continue in order that other Commands might be strengthened, this ought to be admitted and the consequences of such a policy accepted.

Letters  
Douglas-Portal,  
Douglas-  
Babington d.  
14 & 16.4.41.

62. Whether the Commander-in-Chief was right in his diagnosis of the Air Ministry's attitude, or not, his alarm is understandable. Throughout the winter it had been assumed that in the spring of 1941 the Germans would renew the mass attacks in daylight which had been beaten off with difficulty in the autumn. True, there were dissentients from this view; (1) but such was the orthodox opinion, which had been accepted in the winter when the expansion of Fighter Command was being discussed. The Commander-in-Chief had then estimated the force that he would need to repel these attacks at 80 day squadrons, each 23 pilots strong. Now that the spring had come and the battle might be considered imminent, what he actually had was

S.3553,  
encl. 63A,  
etc.

/65

(1) Notably Air Vice-Marshal A.T. Harris, who succeeded Air Marshal Douglas as Deputy Chief of the Air Staff. As early as December, 1941 he was almost certain that, so far as daylight mass raids were concerned, the Luftwaffe had shot its bolt.

S.3553,  
min. 59.

FC/S.23836,  
encl. 5A.

65 squadrons (including those in process of formation) whose average strength was considerably less than this. (1) Six of these squadrons were about to go to the Middle East, and it was expected that the average strength of the remaining 59 would be about 20 pilots. To put the position in another way, the Command would have to meet the expected onslaught with six more day squadrons, but only some 60 more pilots than had been available at the beginning of August, 1940. Moreover, the proportion of seasoned pilots and the general level of experience throughout the squadrons would almost certainly be lower than in 1940. (2)

63. Nevertheless, there was a good deal to be said on the other side. In the first place, the size of the force confronting Fighter Command in northern France and the Low Countries was known to be substantially less in the Spring of 1941 than in the summer of 1940. German intentions with respect to Russia were not yet clear; but several flying units had been withdrawn to the Mediterranean and Balkan theatres. It seemed unlikely that they would return to the Western Front without some warning, if at all. Secondly, the first-line strength of the Royal Air Force was backed by a /far

S.3033,  
encl. 76A,  
etc.

FC/S.23836,  
encl. 5A.

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- (1) The number of squadrons was that actually promised by the Air Ministry, who had been unable to accept the Commander-in-Chief's estimate. The fact remains that the size of the force he had considered necessary was 80 squadrons. (See paras. 70 - 71, below.)
- (2) It was estimated that nearly half the operational pilots in the squadrons on August 1st, 1940 were seasoned men, most of whom had fought successfully in May and June. Between that date and March 31st, 1941 the Command lost, as the result of combats, accidents and postings, some 1,300 pilots, or roughly the equivalent of its entire strength. Although some of the casualties were newcomers, so that a back-bone of veterans remained, these casualties included many of the most experienced pilots in the Command. Replacements were drawn almost entirely from men who had been hurried through the O.T.U.s. in the autumn or whose operational training had been hampered by winter weather. It was hardly to be doubted that this handicap would outweigh the extra experience gained since August by the few veterans who had gone right through the fighting and were still in the Command.

far greater capacity for replacement than had existed in 1940. Should the Luftwaffe concentrate once more in the west, it would be possible to take experienced pilots from outside Fighter Command and put them quickly through the expanded operational training organization, which itself constituted a valuable reserve of pilots and aircraft. Moreover, the productive capacity of the aircraft industry had increased so much since the previous summer that more fighter aircraft had been produced in February and March, 1941 than in any previous two months since the beginning of the war.

Statement by  
Min. of  
supply,  
1945.

64. On balance it was felt that the risk involved in keeping Fighter Command short of its establishment was justified. The Commander-in-Chief was asked, therefore, to accept a strength of 21 pilots a squadron for an indefinite period. Before long the arrival of trainees from Canada, which had been delayed by lack of shipping, would it was hoped, do much to bridge the gap between the requirements of the Operational Training Units and their actual intake. In the meantime it was agreed in principle that at least the nuclei of six new fighter squadrons should be formed to replace those going to the Middle East.

Ibid.,  
encl. 2A  
and 9A

iii. The Remainder of 1941.

65. On the whole the assumptions on which this decision rested proved to be well founded. The threatened renewal of the daylight offensive in fact did not occur; and by the end of the first week in June the position had improved so much that it was possible for the Air Officer Commanding-in-Chief to contemplate a considerable expansion of the fighter force and the posting of 64 more pilots to the Middle East without its appearing probable that the overall pilot strength would be seriously weakened thereby. (1) Even then Fighter Command's troubles were not over, for delays in obtaining passages for newly-trained pilots from Canada continued to be experienced in the summer. Moreover, the daylight offensive, greatly intensified after the middle

FC/S.21665,  
encl. 48A

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(1) See para, 87, below.

FC/S.23478,  
enc. 59A.

of June, brought casualties as heavy as those which had been incurred in the battle of Britain. (1) The capacity of the training organization to replace such casualties had grown so much, however, that from the numerical point of view these losses were relatively much less serious than those suffered in the previous summer. Thus, in spite of all its difficulties, the Command reached the end of 1941 with a surplus of pilots, although the low proportion of seasoned warriors amongst them gave ground for anxiety.

## VI. THE EXPANSION OF THE FIGHTER FORCE

### i. The Position at the Close of the Battle of Britain

66. At the beginning of November, 1940 there were 67½ squadrons in Fighter Command, including four and a half squadrons in process of formation. (2) Twelve of these were night-fighter squadrons, this figure including, besides the original six twin-engined squadrons, two Defiant squadrons and three Hurricane squadrons which had recently been relegated to night duty together with a new Defiant squadron.

67. In view of the narrow margin by which victory had been won in the recent daylight struggle, and the poor results achieved hitherto against the night bomber, it was not difficult to perceive that a larger fighter force was wanted if the country was to be adequately secure. What was less easy was to determine just how large a force was necessary.

### ii. Recommendations of Director of Operations (Home), December, 1940.

68. An attempt to answer this question on an arithmetical basis was made by the Director of Operations (Home) (3) and his /staff

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(1) Between 20th Dec., 1940 and 31st Dec., 1941, 455 pilots of Fighter Command were lost in daylight offensive operations (excluding reconnaissance flights). The number of pilots and other flying personnel of Fighter Command who lost their lives as the result of the fighting between 10th July and 31st Oct., 1940 was 448.

(2) See Order of Battle at appendix (I) B.

(3) Air Commodore D.F. Stevenson.

Statement by  
P.4 (Cas.)  
d. 23.5.46.

staff in December, 1940. They argued that in the previous summer a fighter force equivalent to 70 squadrons had repelled the attacks of a striking force estimated at 4,500 aircraft; therefore, on the assumption that the Germans would have a striking force amounting to 5,150 aircraft at the beginning and 6,150 aircraft at the end of 1941, 81 fighter squadrons would be needed early in 1941 and 96 at the end of the year. This was simple proportion. But, recognising that the night battle was largely uncharted territory and that some special provision must be made for it, they proposed to increase their estimate for the spring of 1941 to 85 squadrons by adding four new twin-engined squadrons.

69. Apart from its academic character, there were two weaknesses in this argument. In the first place the fighter force which repelled the onslaughts of the previous summer had comprised, not 70 squadrons, but 60 at most; and whether the additional aircraft which were added to the establishment of some of the squadrons in July, 1940 could be considered the equivalent of ten squadrons was doubtful, to say the least. Secondly, experience had shown that night fighters could seldom be used effectively by day, and day fighters only occasionally at night, a principle which the Director of Operations (Home) admitted when he proposed to add four squadrons to the figure obtained by his rule of thumb. It was illogical, therefore, to lump the day and night fighter forces together at any stage of the calculation.

70. By a happy chance, these errors - if errors they were - were mutually compensatory. A calculation based on the acceptance of all Air Commodore Stevenson's assumptions except these two shows that, if the Battle of Britain was fought by 56 day squadrons, then 68 day squadrons would be needed in the spring of 1941. Allowing for sixteen or seventeen night squadrons, the estimate of 85 squadrons in the aggregate was, after all, about right.

iii. Recommendations of Air Officer Commanding-in-Chief,  
Fighter Command, December, 1940

71. However, this was a figure arrived at by academic methods, which took little account of particular and local needs. From the arithmetical viewpoint it might appear that sixteen or seventeen squadrons of night fighters were an adequate allowance; but the Air Officer Commanding-in-Chief, Fighter Command <sup>(1)</sup> was able to show that, if the needs of the different areas to be defended were considered in turn, a plausible case could be made out for the immediate provision of 20 squadrons. Again, from the point of view of the daylight battle, he considered that the proposal to allow him an aggregate of 85 squadrons in the spring of 1941 and add more squadrons in the course of that year and the next was unsound. In his view the crisis would come in the spring and summer of 1941. It was therefore in the first three quarters of 1941 that he would need fighters most; thereafter, it would be unnecessary to increase the size of the fighter force and might be possible to reduce it in order to build up other Commands. Accordingly he suggested that, instead of being given only 85 squadrons in the spring of 1941 and 113 at the end of 1942, as the Air Staff contemplated, he should be given 80 day and 20 night squadrons at the earliest possible moment, the implication being that in this case he would accept a smaller increase, or no increase at all, in the future. With the two formal letters in which he made this proposal to the Air Ministry, he sent detailed plans showing how he would deploy a force of this size.

S.3553,  
encl. 53B,  
54A, min. 57.

S.3553,  
min. 56.

iv. Decision regarding the size of the Fighter Force in  
the Spring of 1941

72. On the assumption that the Germans were likely to attempt a knock-out blow in the spring or summer of 1941, there was much to be said for the Commander-in-Chief's suggestion. Unfortunately it would have been impossible to carry it out without sacrificing a substantial part of the /increase

S.3553,  
enc. 65A,  
66A, 76A.

(1) Air Marshal W.S. Douglas, formerly Deputy Chief of the Air Staff, who had succeeded Air Chief Marshal Dowding on November 25th, 1940.

increase in the bomber force which had been planned for the coming year. Indeed, even to provide in the early spring the force of 85 squadrons which the Director of Operations (Home) had recommended in December, would have entailed sacrifices which the Air Staff were not prepared to make. It was decided, therefore, that the size of the force to be attained by April 1st, 1941, should stand at 81 squadrons, this figure to include the aerial mining squadron (No. 93 Squadron) recently formed. As soon after that date as possible one more squadron would be formed so that there should be 81 squadrons without counting the mining squadron.

v. Formation of new Squadrons, November, 1940 to April, 1941.

73. By the time this decision was ratified, at the beginning of February, 1941, the size of the fighter force actually in being had risen to 76 squadrons in consequence of the conversion of No.421 Flight into No.91 Squadron, the withdrawal of No.73 Squadron for service in the Middle East and the formation of the following new squadrons :

S.3553,  
enc. 76A

Orders of Battle  
Various dates  
(FC/S.20363)

| <u>Day Squadrons</u> |  | <u>Night Squadrons</u>          |  |
|----------------------|--|---------------------------------|--|
| No.258 (Hurricane I) |  | No.96 (Hurricane I and Defiant) |  |
| " 260 (Hurricane I)  |  | " 255 (Defiant)                 |  |
| " 402 (Hurricane I)  |  | " 256 (Defiant)                 |  |
| (Canadian)           |  | " 68 (Blenheim)                 |  |
| No.315 (Hurricane I) |  | " 93 (Mining)                   |  |
| (Polish)             |  |                                 |  |

74. The composition of the force was now as follows :

|             | <u>Day Squadrons</u> |             | <u>Night Squadrons</u> |             |               | <u>Total</u> |
|-------------|----------------------|-------------|------------------------|-------------|---------------|--------------|
|             | <u>S.E.</u>          | <u>T.E.</u> | <u>S.E.</u>            | <u>T.E.</u> | <u>Mining</u> |              |
| Operational | 56                   | 1           | 8                      | 6           | 1             | 72           |
| Training    | 1                    | -           | 1                      | -           | -             | 2            |
| Forming     | 1                    | -           | -                      | 1           | -             | 2            |
|             | 58                   | 1           | 9                      | 7           | 1             | 76           |

75. This left five squadrons still to be formed by April. It was decided on February 9th, 1941 that these should be formed without delay, even at the cost of a temporary reduction in the pilot-strength of existing squadrons and a widening of the gap between the needs of the first line and the ability of the training organization to meet them.

/Accordingly

Accordingly the formation of the following new squadrons began between early February and early April :

| <u>Day Squadrons</u>              | <u>Night Squadrons</u> |
|-----------------------------------|------------------------|
| No. 403 (Tomahawk)<br>(Canadian)  |                        |
| No. 485 (Spitfire)<br>(N.Z.)      |                        |
| No. 316 (Hurricane I)<br>(Polish) | (Nil) (1)              |
| No. 317 (Hurricane I)<br>(Polish) |                        |
| No. 118 (Spitfire)                |                        |

76. At the end of the first week in April, however, the formation of Nos. 403 and 485 Squadrons was still incomplete, while No. 68 Squadron, whose formation had begun in the winter, was still not ready to go into the line and No. 317 Squadron had only one flight operational. Thus the total strength of Fighter Command on the eve of the expected battle, in terms of squadrons formed, amounted to  $77\frac{1}{2}$  squadrons in place of the 100 squadrons desired by the Commander-in-Chief and the 85 squadrons which the Director of Operations (Home) had recommended. (2) This figure included  $61\frac{1}{2}$  day squadrons; but two of these Squadrons were out of the line for the time being, so that the operational strength of the day fighter force on 6th April amounted to  $59\frac{1}{2}$  squadrons - a substantially larger force than had been available at the beginning of the battle of Britain nine months earlier. (3)

The Air Defence  
of Great Britain  
Vol. II,  
p. 81.

77. Nevertheless, in terms of squadrons whose formation had begun, the programme scheduled for April 1st was now complete. The only matter now outstanding was the further squadron whose formation some time after that date had been promised to the Air Officer Commanding-in-Chief on the ground that the aerial mining squadron, No. 93 Squadron, ought not to count in his allotted total of 81 squadrons.

/vi.

The Air Defence  
of Great Britain  
Vol. II,  
p. 81 and  
appx. 2.

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- (1) The conversion of No. 85 Squadron from Hurricanes to Havocs, however, began during this period.  
 (2) See Order of Battle at appendix (I) C.  
 (3) Fifty-two squadrons had been considered fit for operations on 10th July, 1940; but this figure included six Blenheim squadrons as well as two squadrons of Defiants, then still reckoned as day fighters.

vi. Despatch of six Hurricane Squadrons to Middle East  
and Scheme for their Replacement

78. However, a new problem now arose: for the deterioration of the situation in the Mediterranean theatre led to a decision in April to transfer six complete Hurricane squadrons from Fighter Command to the Middle East, <sup>(1)</sup> These six squadrons - Nos. 46, 213, 229, 260, 238 and 249 - were not to sail until May, but in the meantime it was necessary to take steps to replace them. Accordingly it was decided on April 23rd to form a second Eagle Squadron on Hurricanes, four new Spitfire squadrons, and a new twin-engined nightfighter squadron. Thus the Command would lose six day squadrons and gain instead five day squadrons and one night squadron.

vii. Scheme for the Expansion of the Twin-Engined  
Fighter Force

79. This decision having been taken, the next step was to see what could be done to expand the night fighter force and meet other demands for twin-engined fighters. The Air Officer Commanding-in-Chief, Fighter Command, had asked in December, 1940 for 20 night-fighter squadrons, of which eight would be single-engined and twelve twin-engined. It had always been recognized that the single-engined night-fighter would probably be effective only in good weather; and experience had now confirmed this view. The emphasis was therefore on the twin-engined night fighter.

80. By this time the conversion of No.85 Squadron from Hurricanes to Havocs was complete. Fighter Command possessed, therefore, eight twin-engined night-fighter squadrons, not including No.93 squadron. One of these squadrons, however, (No.23) was now used solely for "Intruder" duties. There were, therefore

(1) German (as distinct from Italian) aircraft began to operate in North Africa in February and shortly afterwards it became clear that enemy ground forces were also being reinforced. On March 9th the Italians opened their counter-offensive on the Albanian front and on April 5th Germany declared war on Greece.

C.O.S.(41)  
125th Mtg.;  
C.S.8929,  
passim

Longmore  
Despatch d  
1.11.41, paras.  
35 - 41

therefore, only seven true twin-engined night-fighter squadrons, equipped with A.I. The Commander-in-Chief was thus five squadrons short of his requirement; while there was an additional requirement of two twin-engined squadrons for long-range fighter duties in the Hebridean Sectors. (1)

S.3553,  
enc. 78A.

Setting aside the single-seater Whirlwind squadron, the position with respect to twin-engined fighter squadrons in Fighter Command at the beginning of the last week in April was as follows :

|                                | <u>Requirement</u> | <u>Formed</u> |
|--------------------------------|--------------------|---------------|
| A.I. squadrons                 | 12                 | 7             |
| Intruder squadron              | 1                  | 1             |
| Mining squadron                | 1                  | 1             |
| L.R. squadrons for<br>Hebrides | 2                  | -             |
|                                | —                  | —             |
|                                | <u>16</u>          | <u>9</u>      |

81. The decision made on April 23rd to form a new twin-engined night-fighter squadron would mean, if implemented, that the deficiency in A.I. squadrons would be reduced to four. It was proposed to make good half this deficiency by re-equipping two Defiant squadrons with Beaufighters. This would leave two A.I. squadrons and the two squadrons for the Hebrides to be formed later - possibly in June and July.

S.3553,  
enc. 80A.

viii. Practical Measures to implement the foregoing,  
April and May, 1941.

82. Action to implement the first stage of this scheme was taken at the end of April and beginning of May, when arrangements were made to start training pilots of Nos. 141 and 255 (Defiant) Squadrons on twin-engined aircraft and to begin forming No.406 (Canadian) Squadron on Blenheims. By the middle of May the formation of this squadron and of six new single-engined day squadrons - namely, Nos. 121 (Eagle), 122, 123, 124, 313 (Czech) and 452 (R.A.A.F.) Squadrons - had begun. At the same time No.232 Squadron was removed  
/from

Ibid.

Order of  
Battle d.  
11.5.41.  
(FC/S.20364)

(1) See paras. 27 - 31, above.

from Fighter Command for training in Combined Operations, and although it returned to the Command in July, this squadron subsequently went overseas. Thus the strength of the Command was back at the old figure of 81 squadrons, including the mining squadron, while there were still four squadrons to be formed.<sup>(1)</sup>

ix. Proposals for further Expansion in 1941

83. At this stage the Air Officer Commanding-in-Chief, Fighter Command, after a discussion with the Director of Organization, put forward a scheme which envisaged the formation, not of four, but of no less than twelve new squadrons by July 1st, as a step towards the further expansion in 1941 which the Air Ministry had contemplated earlier in the year.<sup>(2)</sup> Since that time events in the Mediterranean theatre and elsewhere had modified the general situation so much that it was necessary to consider afresh the whole question of the further expansion of Fighter Command in 1941. This the planning staff of the Air Ministry did in June. At a meeting with the Commander-in-Chief on June 29th it was tentatively decided that the aim should be to build up to a strength of 94 day and 30 night squadrons by the end of the year. These figures would include five "Turbinlite" squadrons equipped with the Helmore searchlight, but not the two "Hebridean" squadrons, which it was now proposed to provide out of Coastal Command's allotment, This was a scheme for discussion, not a final plan; and after further consideration by the Air Staff and in the Expansion and Re-Equipment Policy Committee the programme was reduced to 89 day and 30 night squadrons, including the five "Turbinlite" squadrons. Five of the night-fighter squadrons (this number not to include any of the "Turbinlite" squadrons) would be /formed

FC/S.24279  
enc. d.  
26.5.41

S.3553,  
enc. 92a

(1) See Order of Battle at appendix (I)D.

(2) He proposed that they should comprise six single-engined day squadrons, two Defiant squadrons, two A.I. Beaufighter squadrons, and the two long-range squadrons for the Hebrides.

formed only if it could be done without compromising priorities for other theatres and Commands.

84. By the time this decision had been reached, ten Defiant squadrons, nine twin-engined A.I. squadrons and one "Intruder" squadron were in existence and the formation of the "Turbinlite" force on a basis of flights had begun. The Commander-in-Chief proposed to convert four of the Defiant squadrons to Beaufighters and form four twin-engined A.I. squadrons and one new "Intruder" squadron between October 1st and the end of the year.

S.3553,  
enc. 93A.

x. Expansion achieved in practice, June to December, 1941

85. However, it soon became clear that the supply of aircraft and the general strategic situation would not permit this scheme to be carried out in its entirety. A decision to send Beaufighters overseas and difficulties of supply hampered the expansion of the night-fighter force; while in the late summer developments in Russia and elsewhere led to a plan to build up a force in the Middle East which could be used in Iraq in the spring of 1942 should the Germans break through the Caucasus. In the latter connection Fighter Command was required to provide six squadrons for despatch to the Middle East towards the end of 1941.

S.3553,  
enc. 97A.

FC/S.21665,  
enc. 57B.

86. When the winter began the strategic outlook was confused; the only apparent certainty was that the Metropolitan Air Force would need to be strong in 1942. In view of losses incurred recently in offensive operations, therefore, a policy of economy in the employment of aircraft was imposed in November on both Bomber and Fighter Commands. In December the entry of Japan and the United States of America into the war introduced a new strategic factor and also threatened to reduce, at least for a time, the supply of aircraft from American factories. The squadrons which were being sent to the Middle East as part of the force earmarked

FC/S.26678,  
encl. 1A, 2A.

C.S.12253,  
enc. 1A.

C.O.S.(41)  
419th and  
437th Mtgs.,  
etc.

/for

for Iraq were diverted, after they had sailed, to Singapore and Sumatra.

87. While these events were being enacted, a total of 26 new squadrons and ten "Turbinlite" flights was added to Fighter Command. Two of these squadrons were transferred to the north Russian front in the summer; while six squadrons, as has been seen, went to the Far East, together with No. 232 Squadron, which had returned to the Command in July. One squadron, the aerial mining squadron, was disbanded. Thus the Command reached the last week of 1941 with a strength of 100 squadrons and ten "Turbinlite" flights instead of the 114 squadrons and five "Turbinlite" squadrons planned. It had always been recognized, however, that the formation of five of these squadrons might have to be postponed, so that it would be more just to put the deficiency at nine than at fourteen squadrons.

88. The squadrons and flights added to and removed from Fighter Command between June 15th and December 25th, 1941 were as follows :

H.Q.F.C. Org.  
Circulars,  
various dates

| <u>Squadrons added</u>                               | <u>Flights added</u><br><u>("Turbinlite")</u> |
|--|---|
| No. 81 *   | No. 1451                                      |
| " 125  | " 1452  |
| " 129  | " 1453  |
| " 130  | " 1454  |
| " 131  | " 1455  |
| " 132  | " 1456  |
| " 133  | " 1457  |
| " 134 *  | " 1458  |
| " 135  | " 1459  |
| " 136  | " 1460  |
| " 137  |   |
| " 153  |   |
| " 154  |   |
| " 157  |   |
| " 331 (Norwegian)                                    |   |
| " 340 (Free French)                                  |   |
| " 350 (Belgian)                                      |   |
| " 409 (R.C.A.F.)                                     |   |
| " 410 (R.C.A.F.)                                     |   |
| " 411 (R.C.A.F.)                                     |   |
| " 412 (R.C.A.F.)                                     |   |
| " 416 (R.C.A.F.)                                     |   |
| " 417 (R.C.A.F.)                                     |   |
| " 418 (R.C.A.F.)                                     |   |
| " 456 (R.C.A.F.)                                     |   |
| " 457 (R.C.A.F.)                                     |   |
| " 232 (On return from Combined Operations training.) |   |

(\* Under No.151 Wing in Russia, August to December. )

/Squadrons

Nos. 81 & 134  
Squadrons'  
Forms 540

| <u>Squadrons removed.</u> | <u>Reason.</u>                |
|---------------------------|-------------------------------|
| No. 93                    | Disbanded                     |
| No. 17)                   |                               |
| No.135)                   | Transferred<br>to<br>Far East |
| No.136)                   |                               |
| No.242)                   |                               |
| No.258)                   |                               |
| No.605)                   |                               |
| No.232)                   |                               |

89. At the close of this period the Command consisted, then, of 75 day squadrons, 23 night defensive squadrons, two "Intruder" squadrons and ten "Turbinlite" flights. (1)

VII. THE EXPANSION OF THE ARTILLERY, SEARCHLIGHT AND BALLOON DEFENCES

i. Strength of Artillery and Searchlight Defences

90. While the expansion of the fighter force was taking place, the artillery, searchlight and balloon defences were also undergoing expansion.

91. The approved scale of the heavy A.A. defences on the outbreak of war stood at 2,232 guns. Of these, only 695 were actually in existence on September 3rd, 1939, and by the end of the year the figure had risen only to 850. Some progress was made during the next few months, so that by the beginning of the battle of Britain 1,200 guns were deployed. Throughout the remainder of 1940 and the whole of 1941 the position continued to improve gradually. By May, 1941 - the last month of heavy night attacks on this country - the strength had gone up to 1,691 guns. On the outbreak of war with Japan, in the following December, it had reached 1,960 guns.

92. The position with respect to light A.A. guns in the early stages of the war was even worse. Against an approved scale of 1,200 barrels, only 253 were actually available on the outbreak of war. This figure was doubled by the end of the year, but even so the number of barrels available was quite incommensurate with the demand for light A.A. protection. Little progress was made in 1940, while in 1941 the position was complicated by the necessity of finding a

File  
despatch  
Ref:  
W.O. File  
79/H.D./2193

(1) See Order of Battle at appendix (I) E.

large number of barrels for installation in merchant ships. Nevertheless on the outbreak of war with Japan the strength stood at 1,197 barrels.

93. The supply of searchlights was much more satisfactory. On the outbreak of war 2,700 were available towards an approved scale of 4,128, and by the end of the year, the strength had gone up to 3,361. At this time an increase in the approved scale to 4,700 had already been recommended, and by the beginning of the battle of Britain 3,932 lights had been installed. Early in 1941 the figure of 4,532 was reached, but later in the year a shortage of manpower caused the number of searchlights deployed to be reduced.

94. From 1940 onwards much was hoped for from the U.P. or "Z" weapon as a supplement to the heavy gun. The effective use of these weapons was, however, delayed by many factors including shortages of ammunition, so that it was not until well into 1941 that they became generally available for Home defence in large numbers.

ii. Technical Progress and Methods: Artillery and Searchlights

95. An important step forward was taken on October 1st, 1940 when radar was first used to control A.A. gunfire. Towards the end of that year radar also began to be applied to searchlights. During the first three months of 1941 increased quantities of radar equipment, including the G.L.II and S.L.C. sets, became available and the chances of success were greatly enhanced in consequence.

96. The results obtained by the searchlights were, however, not substantially better than before, since pilots still found the lights hard to see. After experiments had been made in the autumn and winter of 1940 the expedient of re-siting them in "clumps" was adopted. Experience showed that this was not the answer to the problem and in September 1941 they were once more re-sited singly on the adoption of the

"killer" and "indicator" zone system.

iii. Organization and Personnel: Artillery and Searchlights

File,  
Despatch  
ref. W.O.  
file 79/H.D./  
2198

97. With the expansion of Fighter Command and the growth of the artillery defences it became necessary to create new A.A. Divisions and re-organize A.A. Command so as to ease the burden on existing Divisions and improve co-operation with the Fighter Groups. At the end of 1940 five new Divisions were formed and three A.A. Corps were created. The new organization was as follows :

1 A.A. Corps

(South: co-operating with Nos. 10 and 11 Groups)  
1st, 5th, 6th, 8th, 9th A.A. Divisions.

2 A.A. Corps

(Midlands: co-operating with Nos. 9 and 12 Groups)  
2nd, 4th, 10th, 11th A.A. Divisions.

3 A.A. Corps

(North: co-operating with Nos. 13 and 14 Groups)  
3rd, 7th, 12th A.A. Divisions.

98. The manpower devoted to the artillery and searchlight defences rose from 106,690 on mobilization to just over 300,000 in May, 1941. Mixed batteries (i.e. batteries manned partly by the A.T.S.) began training in the spring of 1941 and became operational on August 21st, 1941.

iv. Balloon Defences

R.A.F.  
Monograph  
"Balloon  
Defences,  
1914 - 1945",  
Part II,  
passim

99. The initial equipment of the balloon defences on the outbreak of war stood at 1,450 balloons, of which 450 were allocated to the London balloon barrage and 1,000 to provincial barrages.

100. Additions made in November 1939 included barrages at Rosyth and Scapa and a mobile reserve.

101. Further additions early in 1940 brought the initial equipment up to 2,027 balloons by the spring of that year, and subsequently the planned figure rose to 2,600 balloons through additions to the strength allotted to certain barrages and provision for barrages in Ireland.

102. During the early months of the war there were, however, serious shortages in respect of the number of balloons that could actually be flown, largely because casualties due to sudden changes in the weather had been underestimated. Production was at first incapable of bridging the gap and recourse was had to the expedient of keeping deflated a high proportion of the balloons deployed, the number of which was itself considerably below initial equipment. Thus, for example, at the beginning of March, 1940 1,250 balloons were either deployed or in the process of being deployed, but only about 470 were expected to be inflated at any one time.

103. Clearly this was not a situation which could be accepted for long. In the summer of 1940, therefore, vigorous steps were taken to increase production. The situation improved so much in consequence that on November 1st, 1940 the number of balloons authorised to fly reached 1,958, and of these 1,741 balloons actually flew. (1)

104. Further progress was made during the winter, and on April 1st, 1941 the corresponding figures were 2,191 and 2,115 balloons respectively. (2) The number of balloons flying on December 31st, 1941 was 2,340.

H.Q. Balloon  
Command Form  
540 and appen-  
dices.

#### VIII. THE SECTION OF TWO AIRCRAFT AND THE THREE-SQUADRON WING

105. Two important changes in the organization of flying units had been made in consequence of experience gained in the battle of Britain.

106. One lesson of the battle was that a section of two aircraft was tactically more efficient than a section of three. When a formation broke up in the course of combat, it was desirable that it should break into pairs, so that individual pilots could give and receive mutual protection fore and aft. A section of three aircraft, of course, could not do this. Consequently it was decided that the section of three must give way to the section of two.

Dowding,  
despatch,  
para. 20.

(1) Details are given at appendix (I) F  
(2) Details are given at appendix (I) G

No. 9 Group,  
etc. Form 540

107. This change conflicted with the existing administrative structure of fighter squadrons, which was based on the section of three. But the tactical superiority of the section of two was so apparent that some sacrifice of administrative convenience was clearly justified; and on April 10th, 1941 the section of two was adopted as standard throughout Fighter Command. Thenceforward each squadron consisted, as before, of a squadron headquarters and two flights; but instead of each flight comprising two sections of three aircraft each, it comprised three flights each of two aircraft.

108. This was an example of a reform which was so generally felt to be necessary that it almost imposed itself, without having to be dictated from on high. The adoption of the three-squadron wing as a tactical unit was very different. It would be hard to think of any measure in the whole field of air defence whose utility was more widely debated or which caused livelier controversy.

109. Yet there was nothing revolutionary or even new about the use of such formations. In accordance with the principle of decentralisation which was observed in Fighter Command, the normal arrangement was that, subject to the observance of the broad principles of air fighting which were laid down in Air Fighting Committee Papers and other standard publications, and to the guidance given in very general terms by Command Headquarters, the tactical employment of the squadrons assigned to the defence of a Group area was left to the discretion of the Air Officer who commanded that Group. During the spring and summer of 1940 the bulk of the fighting fell on No.11 Group; and Air Vice-Marshal Park, its Air Officer Commanding, used his squadrons singly, in pairs, or in three-squadron wings as circumstances and his judgement dictated. But to

Instruction  
11G/486 d.  
1.10.40.

/assemble

assemble a wing of three squadrons took some minutes, and in cloudy weather there was always a risk that the squadrons might miss each other; so that the number of occasions on which he considered it safe to use this tactic when defending targets in south-east England was comparatively small.

110. On the other hand the use of wings consisting of several squadrons was found highly effective by No.12 Group when sending aircraft south to reinforce their neighbour. In five operations undertaken early in September, 1940, No.12 Group, using wings of three to five squadrons, claimed the destruction of 105 enemy aircraft for the loss of fourteen fighters and six pilots. The Air Officer Commanding No.11 Group did not dispute these figures; but he alleged that these and similar successes had been obtained against formations already in retreat and at the cost of leaving unprotected the objectives which No.12 Group had been asked to guard. Although there was some truth in these assertions,<sup>(1)</sup> the possibility remains that No.12 Group might have done equally well against incoming formations if they had been called in earlier.<sup>(2)</sup>

S.5566,  
enc. 6B.

Ibid.,  
encl.16A, 17E;  
No.11 Group  
Instruction to  
Controllers  
No. 7, d.  
27.8.40.

The Air Defence  
of Gt.Britain,  
Vol.II, pp 534  
and 536.

111. At all events, the success achieved by No.12 Group was sufficiently striking for their methods to be contrasted by some critics with those of No.11 Group to the disadvantage of the latter. This contrast was fallacious, for the Groups were so differently circumstanced that their methods were complementary rather than alternative. Nevertheless the comparison was in fact drawn; and a controversy arose which engendered a warmth that was perhaps all the greater because the failure of both sides to recognize this cardinal fallacy rendered all argument

Ibid.,  
p. 573.

The Air Defence  
of Gt. Britain,  
Vol.II, p.534

Ibid.

- /inconclusive
- 
- (1) The most striking results achieved by the No.12 Group Wing were on September 15th and 18th, against formations which had already been engaged by No.11 Group.
- (2) The A.O.C. No.12 Group claimed that he could get a wing of five squadrons into the air in six minutes and over Hornchurch at 20,000 feet in 25 minutes. Warning of incoming raids was usually received by No.11 Group ten or fifteen minutes before they crossed the coast.

inconclusive. Contrary to the belief of many, this controversy did not turn upon whether three squadrons were or were not a better weapon to use against a large enemy formation than one squadron or two squadrons. This was not seriously disputed. The controversy turned upon whether or not their use should be obligatory in circumstances which, in the opinion of No.11 Group, were not propitious for the assembly of several squadrons as a preliminary to interception.

S.5566,  
encl. 19A.

112. A conference held at the Air Ministry on October 17th to settle the controversy failed to do so because, rightly or wrongly, this issue was evaded. The conclusion then reached was that formations of three or more squadrons should operate as tactical units against mass raids "where conditions were suitable"; but as to what constituted suitable conditions for the use of such formations no decision was reached. Consequently the dispute continued. In the course of it both sides were undoubtedly guilty of misunderstanding the other's point of view. Supporters of the No.12 Group thesis did less than justice to the achievements of No.11 Group and its commander<sup>(1)</sup>: it is clear, for instance, that many criticisms of the Air Officer Commanding were made in partial ignorance of his problems and the steps he was taking to solve them.<sup>(2)</sup>

S.5566,  
min. 7.

- /Conversely,
- (1) They might have reflected that Air Vice-Marshal Park's tactics could not be entirely unsound, since they had brought success in the first major battle which he had been required to fight.
- (2) For example, critics who alleged that squadrons were sent up "piecemeal" with no clearly defined task were evidently unaware of the instructions issued by No.11 Group and of the actual practice in this respect.

FC/S.21441,  
encl. 12A.

Conversely, Air Chief Marshal Dowding has recorded the opinion that No.11 Group were slow to take advantage of the No.12 Group wing in September, though they may have been justified in fighting shy of this tactic in October. Moreover, there was a tendency on both sides to beg the question. "I am sure you will agree", said the Deputy Chief of the Air Staff, who was inclined to support No.12 Group's case, "that it does not matter in the least who shoots the enemy down, nor where he is shot down, as long as he is shot down in large numbers." But this was just what No.11 Group denied: so far from thinking it immaterial where the enemy was shot down, they considered it essential to shoot him down before he reached his target. Since their frequent assertions of this doctrine brought no reproof from the Air Staff, presumably this was also the official view. But No.11 Group themselves begged the questions when they suggested that wing formations were incapable of intercepting in time to prevent targets being bombed; for this was not entirely true in fact, and even if it had been, there was no proof that earlier interception by wing formations could not be achieved if conditions were altered; e.g., by adopting a different deployment of squadrons on the ground.

113. But although the conference of October 17th did not succeed in ending the dispute, <sup>(1)</sup> it did have a practical sequel.

(1) The controversy continued to rage throughout October and into November. On November 25th Air Marshal W.S.Douglas succeeded Air Chief Marshal Dowding as Air Officer Commanding-in-Chief, Fighter Command and shortly afterwards (on December 18th) Air Vice-Marshal T.L. Leigh-Mallory, the principal advocate of large formations, moved from No.12 Group to succeed Air Vice-Marshal K.R. Park in the command of No.11 Group. Air Vice-Marshal Park left the command and the vacant place at No.12 Group was filled by Air Vice-Marshal Saul, from No.13 Group. No.13 Group remained in the hands of its Senior Air Staff Officer, Air Commodore C.H.Nicholas, until February 4th, 1941, when Air Vice-Marshal J.O.Andrews, a former Assistant Chief of the Air Staff, took up the post of Air Officer Commanding. In so far as the dispute was a personal issue, these changes may be said to have cut the Gordian knot. But in any case, the fighting had now reached a stage at which not even the most convinced advocate of large formations could claim that their use was justified.

S.5566,  
min. 9.

S.5566,  
encl. 19A.

FC/S.22180,  
min. 4.

Ibid.,  
min. 2 & 3.

Early in the controversy the Deputy Director of Air Tactics <sup>(1)</sup> had suggested, after discussion with the staff at Headquarters, Fighter Command, that it would be easier to use wings as tactical units if all the squadrons which together were to form a wing could be based at one aerodrome or at aerodromes close together. Without committing itself as to the circumstances in which wings were to be used, the conference partially endorsed this suggestion by recommending that at any rate all the squadrons composing a wing should operate from the same sector and that as far as possible a wing should always consist of the same squadrons. Soon after he had succeeded Air Chief Marshal Dowding as Air Officer Commanding-in-Chief, Fighter Command, Air Marshal Douglas affirmed his sympathy with No.12 Group's point of view and proceeded to put this recommendation into effect. The terms in which he announced this decision to a staff which was still inclined to be reluctant are of some interest.

"I have never been very much in favour", he said, "of the idea of trying to interpose fighter squadrons between enemy bombers and their objective. The best, if not the only, way of achieving air superiority is to shoot down a large proportion of enemy bombers every time they come over... I would rather shoot down 50 of the enemy bombers after they have reached their objective than shoot down only 10 before they have done so."

114. This was perhaps the most definite statement of policy in regard to this matter made by any responsible officer up to that time. It summarised, with a precision lacking in previous discussions, an attitude to the problem of air defence, which experience has yet to invalidate. Nevertheless, how far this attitude was compatible with the directive calling for the protection of vital points in the aircraft industry, by which the Air Officer Commanding-in-Chief, Fighter Command was then bound, is open to debate. The point of view here expressed may be contrasted with that reflected in the observation of Air Marshal Douglas's predecessor that if, during the German attacks

(1) Group Captain H.G. Crowe.

Dowding,  
Despatch,  
para.203.

attacks on London, "the policy of big formations had been adopted, many more bombers would have reached their objectives without opposition".

FC/S.22180,  
min.4, encl.  
6A - 11A

115. On the Commander-in-Chief's instructions, arrangements were now made to provide wings on the semi-permanent basis recommended by the conference, in a number of the sectors in the south and south-east. The intention was that there should be Spitfire wings in the Tangmere and Hornchurch Sectors, a Hurricane wing in the Kenley Sector and another north of London, and mixed wings in the Middle Wallop, Duxford and Wittering Sectors. (1) In February Fighter Command obtained the consent of the Air Ministry to the appointment of a Wing Commander as second-in-command at fifteen of the principal stations in the Command. (2) This solved the problem of providing officers to lead the wings and also made it possible to extend the system. In practice the opportunity to use the Wings for defensive purposes did not come, since the Germans never repeated their mass attacks of 1940; but the wings played an essential part in the "Circus" offensive which began in January, 1941 and was intensified after the middle of June.

Ibid.,  
min. 19

Ibid.,  
encl. 25A

(1) The deployment proposed was as follows :

| <u>Parent Sector</u>    | <u>Equipment of Squadrons</u> | <u>Bases of Squadrons</u>  |
|-------------------------|-------------------------------|--|
| Middle Wallop           | Spitfire and Hurricane.       | Warmwell and Ibsley or Chilbolton.                               |
| Tangmere                | Spitfire                      | Tangmere and Westhampnett  |
| Kenley                  | Hurricane                     | Kenley and another.  |
| Hornchurch              | Spitfire                      | Hornchurch.  |
| North Weald and Debden. | Hurricane                     | North Weald and Debden.  |
| Duxford                 | Spitfire and Hurricane        | Duxford and Coltishall.  |
| Wittering               | Spitfire and Hurricane        | Wittering plus Digby, and/or Leconfield and/or Kirton-in-Lindsey |

(2) The stations were Speke, Colerne, Middle Wallop, Northolt, Kenley, Biggin Hill, Hornchurch, North Weald, Tangmere, Duxford, Wittering, Digby, Kirton-in-Lindsey, Catterick and Turnhouse.

FC/S.22180,  
min. 19.

PART TWO

THE ATTACK AND DEFENCE OF FRIENDLY SHIPPING.

PART TWO

THE ATTACK AND DEFENCE OF FRIENDLY SHIPPING

The Position before the Outbreak of War

C.I.D. Paper  
No. 1557-B

Before the outbreak of war it was clear that in a conflict with Germany merchant vessels trading with ports on the south and east coasts of Britain would be liable to aerial attack. An obvious solution was to divert this traffic to ports on the west coast, which were considered adequately secure. But even if this measure had been acceptable - and at this time it was not - it was obvious that diversion could never be complete. In wartime some traffic - even if it were limited to coastwise trade - would still have to pass along the Channel and up the east coast. To reduce the inevitable vulnerability of this traffic, the ships would mostly travel in convoy, be escorted by escort vessels carrying A.A. weapons, and steer close to the coast in order to derive as much protection as possible from the squadrons of Fighter Command.

2. However, in the absence of special arrangements this protection would only extend some five miles out to sea. Moreover, even if the convoys hugged the coast as closely as they could, any fighters sent to intercept aircraft which threatened them were unlikely to arrive before the convoys were attacked. Some additional protection was therefore required; and the naval and air authorities agreed that it could best be given by escorting fighters.<sup>(1)</sup> Consequently, it was decided that four squadrons, to be known as the trade defence squadrons, should be added to Fighter Command

Ibid.

C.I.D./371st  
Mtg., item 4

C.I.D. Papers  
Nos. 1557-B and  
D.P.R. 327

/for  
(1) They recommended that, in addition, merchant vessels be armed with A.A. weapons, but considered that these alone could never become an effective deterrent. In any case there were not likely to be enough short-range weapons available to permit their installation in merchant vessels on any large scale for some time to come.

for the purpose of escorting convoys between Southampton and the Firth of Forth. For the moment, however, it was impossible to carry this measure beyond the planning stage, since the programme of expansion to which the Royal Air Force was working would not permit the four additional squadrons to be formed before the financial year 1940-41.

Memo. "Plans"  
d. 31.7.39

The Early Months of the War

3. During the first few weeks of the war several attacks were made by small numbers of enemy aircraft on shipping off the east coast. Some members of the War Cabinet feared that the rejection by H. M. Government of the "peace offer" made by Germany on completion of the Polish campaign would be the signal for an intensification of this offensive. In view of this risk it was arranged in October, 1939 that a number of fighter squadrons should be moved to bases near the east coast so that they should be readily available to intercept enemy aircraft which might make such attacks. It was not intended that these squadrons should provide standing escort; and Air Chief Marshal Dowding, the Air Officer Commanding-in-Chief, Fighter Command, pointed out that interception in time to prevent heavy losses to the shipping attacked could not be guaranteed. This limitation was accepted; but the formation of the trade defence squadrons was accelerated, and these four squadrons - Nos. 235, 236, 248 and 254 - were added to the strength of Fighter Command at the end of the month.

C.S. 2433.  
encl. d.  
10.10.39

FC/S. 17517,  
Pt. 1, encl. 83B;  
Pt. 2, encl. 27A.

C.S. 2433  
encl. d.  
10.10.39

4. The Commander-in-Chief was far from welcoming this addition to his resources; for with these squadrons went responsibility for the protection of the east coast convoys, not merely by means of the Fighter Command "umbrella", but if necessary by means of standing escort. Standing escort meant standing patrols; and standing patrols were anathema to Fighter Command: the interception system was essentially a means of avoiding them. For this reason and for many

H.Q.F.C.  
Form 540  
and appendices

/ others

C.S. 2433,  
encl. d.  
10.10.39

A.H.B.II/120.  
encl. 44

D. of Plans  
Form 540  
W.S.No284  
d.28.2.40

FC/S.17517,  
passim

Statement by  
Operations  
Records, Air  
Ministry,  
Oct. 1946

- others,<sup>(1)</sup> the duty of protecting shipping was always apt to be regarded alike by operational commanders, staff officers and pilots in Fighter Command as a departure from their normal functions; while Air Chief Marshal Dowding, for his part, feared that this extra task might divert the attention of his Command from its main task of protecting the aircraft industry and the country against mass attack. Notwithstanding the decision taken before the war to place the trade defence squadrons under his command, he regarded the protection of shipping against aerial attack as really the business of Coastal Command and the Fleet Air Arm.
5. The Air Council did not assent to this; but in face of Air Chief Marshal Dowding's reluctance to accept the squadrons, they agreed to transfer them for the time being to Coastal Command.<sup>(2)</sup> This move was, however, no answer to Fighter Command's problem, since it was not accompanied by a complete transfer of responsibility for protecting the east coast convoys. The trade defence squadrons were used mainly for other purposes, and meanwhile the burden of protecting the convoys continued to fall largely on Fighter Command.

6. To what did this burden amount? In October, November and December, 1939, the Command flew an average of rather more than 1,000 sorties  
/a month

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- (1) Such as the difficulty experienced by pilots in finding convoys, which were forbidden for security reasons to communicate with the shore and whose position was calculated partly by dead reckoning; the danger of attracting fire from the escort vessels; and the boredom inseparable from duties whose perils in bad weather seemed to some pilots disproportionate to their usefulness.
- (2) In practice they remained in Coastal Command until the end of the war, except for brief periods during the French campaign in 1940, when Nos. 236 and 248 Squadrons returned temporarily to Fighter Command.

a month for the protection of shipping; in January and again in February, 1940, the number was well over 2,000. (1) So long as the "phoney war" continued, and other tasks were few, this effort was within the capacity of the home defence squadrons. But the Commander-in-Chief feared that these conditions would not long continue and that other and more vital demands would soon be made upon him. And in this he was quite right.

Spring and Summer, 1940

7. Prisoners-of-war have reported that it was not until about a month before the outbreak of war that the German High Command made any serious attempt to create a specialized anti-  
shipping organisation within the German Air Force. In the Spring of 1940 it was decided that the scope of the organisation then created should be expanded. At this time the forces at its disposal included a Gruppe of F.W.200s and several Gruppen of He.111s and Ju.88s as well as miscellaneous Coastal Reconnaissance units. (2) This decision was reversed almost as soon as it was made, and most of these units were taken away from the anti-  
shipping organisation to be used in the French campaign. In short, during the greater part of the Spring and Summer the attention of Germans and British alike was focussed on events in Norway, France, and the Low Countries rather than the North Sea. (3)

8. With the termination of the Norwegian and French /campaigns,

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- (1) Including sorties flown for the protection of military traffic across the channel. Standing patrols were not flown throughout the day, but were put over convoys when the ships were thought to be especially threatened.
- (2) The duties of these last units included sea reconnaissance and torpedo-bombing. Subsequently some of them were turned into bomber units.
- (3) On April 10th the Air Ministry authorised Fighter Command to discontinue standing patrols over convoys at their discretion. Instead a flight was kept at "readiness" in the Sector whose front a convoy was passing.

A.D.I.(K)  
Report No.  
13/1946

S.3562/I  
encl. 1A

FC/S.17517,  
Pt.3, encl. 140A,  
141A

campaigns, the United Kingdom was faced with a new situation. The Germans now commanded a string of bases, extending from the Pyrenees to the North Cape, from which our shipping could be threatened, not only at almost every point round our coasts and in the North Sea, but over a substantial portion of the Atlantic. Moreover, the west coast ports could no longer be considered virtually immune from attack.

S.3553,  
min. 23

9. To meet the new threat in the west it was necessary both to change the routing of the Atlantic convoys and extend the area over which protection could be given by the Royal Air Force. Henceforth, instead of proceeding round Cape Clear and through St. George's Channel, the convoys would make for Bristol, Liverpool and the Clyde by way of the North Channel, between Ireland and Scotland. South of Bristol, traffic would, with certain exceptions, be by small coasters only.<sup>(1)</sup> Corresponding measures on the air side included the creation of new fighter Sectors and the development of bases from which long-range aircraft of Coastal Command and short-range fighters of Fighter Command could protect this shipping in the north-western approaches and the Irish Sea.

10. However, it would be some time before these arrangements could be completed. Meanwhile the added  
/threat

FC/S.17517,  
encl. 13B

FC/S.21574,  
encl. 1A

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(1) Originally it was proposed that the convoys should divide at a point to the north-west of Ireland, some of the ships going thence to the west coast ports via the North Channel and others northabout round Cape Wrath to the east coast. Ultimately it was found more economical to restrict ocean convoys to west coast ports and provide "local" convoys northabout from Liverpool and the Clyde. Some fast ships (not in convoy) continued to be brought round Cape Clear.

threat to shipping in general led to greatly increased demands on Fighter Command for protection in those areas where ground facilities already existed; and although since April the policy pursued by Fighter Command and sanctioned by the Air Ministry had been to substitute aircraft held at "readiness" for standing patrols on every possible occasion, in practice it was found impossible to avoid devoting an unwelcome number of flying hours to this purpose. During the first three days of August alone, the Command received no less than nineteen separate requests from various naval authorities for protection of one kind or another; and the number of sorties flown for the protection of convoys or other shipping units went up to more than 3,200 in July, and only some 300 less in August. (1) An incidental pinprick was that some of these requests were made simultaneously to Fighter Command and the Fighter Groups, although the latter were not empowered to say, without reference to Command Headquarters, whether they could be met or not.

11. All this placed a heavy burden, not only on the flying personnel of the Command but also on the Commander-in-Chief and his staff, who sometimes found themselves called upon to decide between rival claimants whose cases they were not professionally qualified to judge. (2) A promise by the Admiralty at the end of August that in future requests would be made in a more regular manner was only a minor alleviation

/of these

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(1) Moreover, these figures do not tell the whole story; for in the early stages of the Battle of Britain there were heavy attacks on shipping in the Channel, and it is impossible to say how many of the sorties flown to intercept enemy aircraft were attributable to these attacks and thus contributed to the defence of shipping.

(2) A number of Naval Liaison Officers were attached to headquarters, Fighter Command, but such a matter as this was not within their competence. Later a senior naval officer (the N.C.A.S.) was attached to the Command Air Staff.

FC/S.17517,  
pt.3, encl.  
140A

FC/S.20737,  
encl. 5A

H.Q.F.C.,  
Forms "Y",  
Pg. 1.

FC/S.20737,  
encl. 9A

of these difficulties.

Autumn, 1940

12. However, as the battle of Britain went on, its focus shifted inland. The attention of attackers and defenders alike became concentrated more and more on objectives away from the coast, so that coastwise trade became relatively less important. Hence in September and October Fighter Command devoted only a few hundred sorties to the direct defence of shipping.

H.Q.F.C. Forms  
"Y", Pt. 1

13. Yet this decline in the importance of coastwise trade was certainly no more than relative. If the number of sorties flown directly for the protection of shipping fell in September and October to a tenth of the figures recorded in July and August, this was not because the volume of traffic, or the value attached to it by the Admiralty, had declined in like proportion, but because at the height of the battle other demands on Fighter Command were so pressing that the provision of standing escort for convoys had clearly become impracticable, save in a few exceptional cases. The defence of the aircraft industry had long been the primary commitment of the air defences; now that the aircraft industry was directly threatened, shipping must take a back seat. This did not mean, however, that it would be left to occupy a back seat once the crisis had passed. That it would not seemed clear enough as early as the beginning of October, when the Admiralty announced that in the immediate future the volume of traffic proceeding northabout from west to east would be substantially increased. The implementation of the decision to limit ocean convoys to the west coast,(1)

R.A.F. Narrative,  
"The Air Defence  
of Gt. Britain",  
Vol.II, p. 18

FC/S.21574,  
encl. 1A

(1) See footnote to para. 9, above. /the

the necessity of increasing stocks of household coal against the coming winter, and interference with rail traffic by air-raid damage, had combined to produce a situation in which it would be necessary to add to the flow of shipping through those vulnerable areas off the east coasts of England and Scotland, in which fighter protection had long been considered especially desirable.

14. The effect of this change on Fighter Command was soon seen. During the week from October 13th to the 19th the number of convoys or other shipping units for which the Command was expected to provide some kind of protection rose to an average of 23 a day. To provide standing escorts on this scale would have been impracticable; and the Commander-in-Chief had taken the precaution of warning the Admiralty when the increase in traffic was first announced that only "fighter cover" could be supplied. As a rule this meant that fighters were held at readiness in the Sector off whose front a convoy stood, to meet any attacks which might be made on it. But the provision even of this degree of protection was not easy, nor was it likely to satisfy the naval authorities in every case.

15. Moreover, at this moment a fresh complication arose.

Notes of Conference held 18.10.40.  
(D.H.O. Br. Folder)

During the third week in October the Air Staff decided, against the advice of the Commander-in-Chief but with governmental approval, to relegate three squadrons of Hurricanes to night duty. This meant that the force available for daylight operations would be correspondingly reduced - a proceeding which the Commander-in Chief considered "dangerous and unsound". Hence he was anxious, first that the implications of this move should be clearly understood by the Naval Staff, and secondly to receive fresh guidance as to his future liability for the protection of shipping in relation to his other commitments.

A.H.B.ID/2/243,  
encl. 21A-27A

Extract from  
C.O.S.(40)  
845  
(S.2438/I)

16. Outwardly at least, his first point was met by a warning given by the Chief of the Air Staff to the Chiefs of Staff Committee on October 22nd. The Committee "noted with approval" the decision to withdraw the three Hurricane squadrons from the day-fighter force, and agreed to accept a consequent reduction in the scale of protection given to convoys off the east coast. But there was no real certainty that this act of abnegation would be followed by a practical reduction of the demands made by the naval Commanders-in-Chief; and as it happened, the operation of a fresh factor was soon to produce the opposite tendency.<sup>(1)</sup>

A.H.B.ID/2/243,  
encl. 21A-23A

17. In regard to his second point, on October 16th the Secretary of State for Air, in consultation with the Air Staff, had assured the Commander-in-Chief that if he considered it necessary to move some of his resources away from the east coast, he was free to do so "even at the expense of the convoys". The Secretary of State pointed out that the Air Staff had always recognized that in a situation such as now existed it would be impossible to provide adequate protection for convoys on the south-east coast, and that the Admiralty had accepted this limitation.

Ibid.,  
encl. 25A

18. This, of course, was before the decision to relegate the three Hurricane Squadrons to night duty; and moreover it was in connection with convoys between the Pentland Firth and the Nore, not "on the south-east coast", that difficulties were likely to arise. The Commander-in-Chief therefore asked on October 20th

/for further

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(1) See paras. 22 - 27, below.

for further guidance, at the same time drawing the attention of the Secretary of State to the notification of increased northabout traffic which he had received from the Admiralty<sup>(1)</sup> earlier in the month, and the terms of his reply.

19. This request was considered by the Secretary of State and the Air Staff during the next fortnight. They came to the conclusion that, in the light of the proceedings of the Chiefs of Staff Committee on October 22nd, the Admiralty must be judged fully aware of the necessity to reduce the protection afforded to convoys off the east coast. Accordingly, the notification received earlier in the month was now to be regarded less as a request for increased protection, than as a piece of information furnished in the hope that the air defences would go on giving all the protection they could. On November 8th, therefore, the Secretary of State wrote to tell the Commander-in-Chief that his reply to the Admiralty had the Air Ministry's approval, but that so long as the protection of convoys remained practicable, it was essential that this protection should be given. Moreover, the protection of flotillas and mine-sweeping craft was also a commitment of the air defence, which most be met "so long as the situation permits".

20. That this declaration accurately reflected the relative importance attached by the Air Staff to the defence of the aircraft industry and the protection of shipping is not in doubt; but its shortcomings from the point of view of a Commander-in-Chief who had already differed from them on an important issue are obvious. What the Air Staff had in mind - and of this they made no secret - was that, as winter approached, the scale of the daylight offensive was likely to diminish. It might then be possible to do more for shipping, even with a reduced day-fighter force,

/than now

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(1) See para. 13, above.

Ibid.,  
encl. 26A

Ibid.,  
encl. 27A

Ibid.,  
encl. 26A. 27A

than now seemed likely. Yet the fact remained that for the present the Commander-in-Chief was bound by a directive which made the defence of the aircraft industry his primary commitment. To discharge this task to the satisfaction of the Minister of Aircraft Production, the whole of his resources would scarcely have been too great. Only a few weeks ago he had been assured that, if he thought it necessary to divert squadrons from the protection of convoys to the defence of aircraft factories in the Midlands, he was at liberty to make this transfer. This directive had never been revoked; yet now he was informed that nevertheless he must not fail to protect an increasing number of convoys so long as it was practicable to do so. Clearly there was room for much misunderstanding here; and clearly, though he might be nominally free to disregard the claims of the naval Commanders-in-Chief in favour of those urged by the Minister of Aircraft Production, he would risk incurring the Air Ministry's displeasure if his notion of the practicable should happen to differ from theirs. While it is difficult to see, therefore, what better guidance the Air Staff could have given at this juncture, it is also obvious that such guidance as this could only have been found quite satisfactory by a Commander-in-Chief who was sure that his mind was at one with theirs on all important points.

21. Nevertheless, from these exchanges a few facts did emerge. One was that the defence of the aircraft industry, by day and night, was still the first task of the air defences. After that - but how far after nobody quite knew - came the protection of shipping. Thirdly, the Air Staff agreed that this protection should

/generally

generally be provided by means of "fighter cover" rather than standing escort. This, at any rate, was something to go on; and this last fact, incidentally, enables us to understand how it was that, although the demands of the naval authorities had already increased since the summer, and were about to increase still further, the effort devoted by Fighter Command to the direct protection of shipping remained during the next four months at an average of 425 sorties a month, as against 2,000 a month at the beginning of 1940 and 3,000 a month in July and August.<sup>(1)</sup>

H.Q.F.C. Forms  
"Y", Pt. 1

November, 1940.

i. The Resumption of Mass Attacks

22. Meanwhile a new factor had come into operation, which was bound to lead to an increase in the demands made on Fighter Command by the naval authorities, rather than their reduction. This was the resumption of attacks on shipping by enemy aircraft acting together in substantial numbers.

23. On the morning of November 1st, minesweeping trawlers off Dover were heavily shelled by enemy shore batteries. Early that afternoon shipping in the Thames Estuary, which included a convoy bound for London, was attacked by enemy aircraft: a merchant vessel of 1,317 tons was sunk, as were the East Oaze light vessel and a trawler. At about the same time drifters in the Straits of Dover were also attacked and one sank. The defences reported that the attacks had been made by some 50 Ju.87 dive-bombers, accompanied by other bombers and fighters, and that at least

/ten enemy

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(1) A table at appendix (II)A shows the estimated enemy effort against shipping, the results that it achieved, and the number of sorties and proportion of the total daylight effort devoted by Fighter Command to the protection of shipping, month by month from November, 1940 to December, 1941. The figures for sorties flown by Fighter Command do not, of course, take into account the potential flying effort sacrificed by holding aircraft at readiness.  
(See also footnote to para.47, below)

War Cabinet  
Weekly Resume

A.M.T.I.S.  
d. 2.11.40

H.Q.F.C.  
"Combats &  
Casualties"

War Cabinet  
Weekly Resumé

Ibid.

D.S.N.E.;  
H.Q.F.C.  
Forms "Y"

A.M.T.I.S.  
d. 8.11.40

A.M.T.I.S.  
d. 9.11.40

H.Q.F.C.,  
"Combats &  
Casualties"

D.S.N.E.No.424

A.I.1.(K)  
Report No.859/1940;  
D.S.N.E.No.391

A.I.1.(K) Report  
No. 884/1940

H.Q.F.C.  
"Combats &  
Casualties"

ten enemy aircraft had been shot down.<sup>(1)</sup> On the same day enemy aircraft attacked a corvette off Yarmouth.

24. This was the first attack on shipping by a substantial formation of enemy aircraft for many weeks. The Ju.87 had not been reported in action since August 18th.<sup>(2)</sup> There was therefore some ground for thinking that a new phase of the offensive had begun, and that further attacks of this nature might be expected.

25. This belief was soon confirmed. On the following day a convoy was attacked four times off Harwich. For the next few days only attacks by single aircraft or small formations were reported; but on November 7th Ju.87s were reported over the Thames Estuary and also off Portsmouth, and a convoy in the Barrow Deep was attacked several times in the forenoon and early afternoon.

26. More attacks followed on the next day; and this time forces containing some 80 dive-bombers were reported. Further mass attacks on shipping were attempted on November 11th<sup>(3)</sup> and 14th. In the course of these operations heavy losses were inflicted on the enemy, notably on November 8th and 14th.<sup>(4)</sup> If any doubt still existed about the vulnerability of the dive-bomber in the face of adequate defences, this experience was calculated to dispel it; and it is

/notable

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(1) Including two big ships.

(2) There is, however, some reason to believe that Ju.87s of St.K.G.2 may have taken part in an attack on a convoy off the North Foreland on September 29th.

(3) Italian aircraft shared in this day's operations, although shipping was not the objective specifically assigned to them.

(4) Nos.17 and 74 Squadrons did particularly well, each on a single occasion claiming the destruction of at least fourteen and fifteen Ju.87s respectively. The total claims of the defences on November 14th amounted to more than a third of the enemy forces seen.

A.M.T.I.S.,  
various dates.

notable that after the middle of November the Ju.87 was very seldom used in daylight on the Western Front.

27. In the meantime the new offensive was disquieting, both to the crews of vessels and to those responsible for directing policy and operations. In the circumstances fresh demands for air protection were inevitable. On November 8th the Commander-in-Chief, the Nore, suggested that a standing patrol should be flown over the Barrow Deep whenever a convoy was entering or leaving it, for the double purpose of protecting the convoy and heartening the crews of the neighbouring light vessels. (1) So seriously did he regard the matter that, not content with making this suggestion by signal, he sent his Chief of Staff to Headquarters, Fighter Command to present his case.

Ibid.,  
encl. 27A

28. Now, what the Commander-in-Chief, the Nore was asking was really a great deal. Apart from the acknowledged wastefulness and relative inefficiency of standing escorts, there were special difficulties in the way of providing such an escort at the place in question. Regulations imposed largely for the benefit of the naval authorities themselves prohibited pilots, virtually on pain of being engaged by ships' guns, from approaching within 1,500 yards of a merchant vessel, or six miles of a warship, except in conditions which they could not fulfil in the case in point without putting themselves at a tactical disadvantage. (2) While a patrol of the kind asked for might or might not hearten the crews of the lightships,

/therefore

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- (1) The Barrow Deep is a channel off the mouth of the river Crouch, through which convoys entering or leaving the Thames Estuary had to pass. Sinkings here were particularly undesirable since the wrecks impeded traffic, thus causing convoys to "string out" and become more vulnerable.
- (2) These regulations were contained in the document known as S.D.158, and are thus denoted in references below. They were supplemented by an Admiralty message dated March 8th, 1940 which authorised ships to "engage by day and night any aircraft not recognised as friendly which approach within range of ships' guns".

C.I.D. Paper  
No. D.P.R. 327

S.D. 158(1)  
(3rd Edn.),  
paras. 34-35

C.S. 2433,  
encl. 54A

therefore, it was perhaps even more likely to dishearten the pilots of the aircraft making it.

29. Nevertheless, there was only one opinion about the importance of doing everything that could reasonably be done to safeguard the convoys; and the Commander-in-Chief at once drew the attention of the Air Officer Commanding No. 11 Group to the importance attached by the Royal Navy to the Barrow Deep and its prompt defence. <sup>(1)</sup> At the same time the desirability that the ships should abstain from firing at their protectors was impressed upon the representative of the Commander-in-Chief, the Nore. However, so long as the restrictions imposed by S.D. 158 <sup>(2)</sup> remained in force, there was clearly little that he could do to mend the situation; and it was therefore necessary to remind the Air Officer Commanding No. 11 Group that, notwithstanding the instructions he had just received to send his aircraft where the crews of ships could see them, they must continue to conform to the regulation which required them to keep at least 1,500 yards away from merchant ships and out of range of A.A. fire from escort vessels.

FC/S.21574,  
encl. 27A

Ibid.,  
encl. 30A

30. This was not very satisfactory; but here the matter rested for the present. Meanwhile Air Chief Marshal Dowding was invited to attend a conference at the Air Ministry whose purpose was to discuss measures for the protection of ocean convoys in the north-western approaches, but which might afford an opportunity of raising some points of more immediate interest to Fighter Command. The Staff

/at Headquarters,

FC/S.21574,  
encl. 33A

(1) The A.O.C. No. 11 Group had already taken steps to counter the new offensive.

(2) See footnote to para. 28, above.

at Headquarters, Fighter Command had already drafted a letter asking the Air Ministry to clarify their attitude to the whole matter. In view of the forthcoming conferences, it was decided that for the moment this letter should be held back.

ii. The Conference of November 12th

31. The protection of convoys in the Barrow Deep and off the east coast was important; but it was not the only urgent problem that confronted the Naval and Air Staffs. It was at least equally necessary to consider the protection, not only against submarines, but also against an aerial threat that included the F.W.200 very long-range bombers<sup>(1)</sup> which had begun to operate from Bordeaux, of the traffic which approached the west coast from the Americas, Africa, and the Mediterranean by way of the North Channel.

32. The vital nature of this task was clear. The Director of Home Operations went so far as to say that in comparison the shipping that passed along the east coast was "sheer trash". The trade-route through the north-western approaches was, he urged, the "single strand" which still connected the United Kingdom with the outer world: if it were severed, the war was lost. What had been done, and what remained to be done, to ward off this disaster?

33. To answer these questions, it is necessary to go back to the end of June. Approval had then been given to a scheme which visualized the formation of new Fighter Sectors in the north-west and of a new Fighter Group with its headquarters at Preston. By the middle of November these arrangements were not yet complete, although the

/development

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(1) At that time the Air Staff estimated the effective radius of action of the F.W.200 at 1250 miles, and of the Ju.88 and He.111 at 777 miles.

S.7168,  
encl. 18A.

S.3553,  
minute 25

Ibid.,  
min. 23

development of the new Sectors was being hastened. When in being the scheme would throw "the umbrella of the eight-gun fighter" over the greater part of the waters between the Rhinns of Islay and Lands' End. (1)

34. So far, so good; but it was also necessary to consider the protection of the shipping during its passage through that part on the zone of action of the German long-range-bomber force which the short-range fighter could not reach. Careful timing could ensure that part of this dangerous area was traversed at night; but the Air Staff calculated that it would still be necessary to give long-range fighter escort to convoys within 150 or 200 miles of the outer end of the North Channel. To do this, at least three squadrons of long-range fighters would be needed.

Ibid.

S.7168,  
encl. 2A

35. The problem facing the Air Staff in November was to find these three squadrons, and also persuade the Admiralty, if they could, to route the shipping so that it would be within range of the German long-range-bomber forces for the shortest possible time before coming under the protection of these long-range fighters, which would be based in the Hebrides or Ulster.

Ibid.,  
encl. 14B

36. The route which would have suited the Air Staff best was impracticable because of the limited endurance of some of the ships. On this point, therefore, a compromise was reached.

Ibid.,  
encl. 1A

37. As for finding the three squadrons of long-range fighters, the position on the date of the conference was that Coastal Command possessed five

/such

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(1) To cover the whole of these waters it would have been necessary to base short-range fighters in Eire. The scheme made provision for this to be done if circumstances should make it possible; but these circumstances were never to arise. (See also paras. 73-74, below)

(1)  
such squadrons. Half a squadron was already at Aldergrove and available for the purpose envisaged. Of the remaining four-and-a-half squadrons, one was required for essential duties at Sumburgh; another could hardly be spared from St. Eval, where its duties included providing escort for the fast vessels (not in convoy) which were still being routed south of Ireland. This left half a squadron at Thorney Island, near Portsmouth, and a squadron each at Dyce and Bircham Newton. These two-and-a-half squadrons had various duties, of which the most important was to share with Fighter Command squadrons the task of protecting coastwise trade, especially off the east coast and above all in the dangerous area between the Tay and the  
(2)  
Pentland Firth.

38. On the assumption that the protection of trade between the Tay and the Pentland Firth could be done by Fighter Command alone, the Air Staff suggested that the three squadrons of long-range squadrons needed in the north-west should be made up by adding to the half-squadron already at Aldergrove the two-and-a-half squadrons from Dyce, Bircham Newton, and Thorney Island. The naval authorities agreed that it might be possible to route convoys closer inshore across the mouth of the Moray Firth, so as to bring them within range of short-range fighters.

Ibid.,  
encl. 14B

39. The Air Staff recognized that the removal of these squadrons from their present bases was open to objection; but they argued that the ocean convoys were so much more important than the traffic off the east coast, that to move at least the squadrons at Dyce and Bircham Newton from east to west was the only realistic policy. Eight vessels with an aggregate

Ibid.,  
encl. 14B  
and 18A

Ibid.,  
encl. 1A

/tonnage

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(1) Another was due to be formed shortly and the long-term programme provided for two more.

(2) This stretch of coast was a source of special anxiety because of the shortage of aerodromes near it and the enemy's fondness for attacking shipping there at dusk.

tonnage of 113,307 tons had been bombed and hit to the west and north-west of Ireland between October 26th and November 9th. This was a threat to the "lifeline" which must not be ignored.

Ibid.,  
encl. 14B

40. The Naval Staff did not accept this argument. They considered the coaster traffic off the east coast "of the first importance"; many ships had been sunk in the Moray Firth; and while they would welcome more protection by short-range fighters in that area, and would consider altering the convoy route to facilitate it, they did not agree that the withdrawal of all the long-range fighters could be accepted. The Officer Commanding-in-Chief, Coastal Command, for his part, was opposed to the withdrawal of any of the long-range fighters from Dyce or Thorney Island,<sup>(1)</sup> but believed it might be possible (though he thought it inadvisable) to spare a few from Bircham Newton.

41. After discussion a compromise was reached: it was decided that half a squadron should be moved from Bircham Newton to Aldergrove, so that at any rate one whole squadron out of the three postulated by the Air Staff would be assured. Any move of long-range fighters from Dyce must await the Admiralty's decision regarding the feasibility of re-routings convoys across the Moray Firth.<sup>(2)</sup>

iii. Difficulties of Fighter Command and Proposals for their alleviation.

42. Clearly these proceedings provided no solution to Fighter Command's problems; indeed,  
/their

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(1) His reason for wishing to retain the half-squadron at Thorney Island was that he needed it for offensive operations.

(2) Another decision made at this conference was to increase the initial equipment of the long-range fighter squadrons from sixteen aircraft to twenty "as soon as possible".

their tendency was to increase them. Should the Admiralty find it possible to re-route convoys across the Moray Firth so that they could be protected by short-range fighters, the fighter force in north-east Scotland would have to be strengthened. In the meantime the demand for close protection in this area was so insistent that, even as it was, the Command was forced to agree to the partial resumption (1) of standing escorts where the route was already within range. And there was a hint of further demands to come in a remark by the Fifth Sea Lord to the effect that a standing escort was often more acceptable to ships' crews than the holding of aircraft at readiness.

43. A few days after the conference, therefore, the Commander-in-Chief despatched the letter already drafted, in which he asked the Air Ministry to clarify their policy with respect to the protection of shipping. He pointed out that the request by the Commander-in-Chief, the Nore, for close protection in the Barrow Deep, like a number of other requests which he had received from naval authorities, was incompatible with the provisions of S.D.158. He expressed his earnest desire to afford every possible protection to shipping; but asked that the Admiralty and Merchant Navy should be invited to recognize the practical limitations of the fighter force by abandoning either their claim to close escort or else the privilege of opening fire at aircraft which approached ships without convincing the crews that they were friendly. He suggested that the clarification desired might take the form of approving a scheme which had already been partially adopted in his Command. Under this scheme three degrees of fighter protection for shipping were

/recognized,

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(1) The Command was asked to pay special attention to the period just before dusk, when even a small escort would be of value in countering the attacks by single aircraft which often occurred at that time.

FC/S.21574,  
encl. 52A

Ibid.,  
min. 54

Ibid.,  
encl. 52A

recognized, namely:

- a "Close escort". This would be given only in special cases and by prior arrangement. In these circumstances the aircraft would not be required to stay outside the 1,500-yard limit.
- b "Protection". This would mean the allocation of specified fighter units for the defence of given shipping units during a stated period. The fighters would be either at "readiness" or on patrol, not necessarily in the immediate vicinity of the shipping and in any case not within 1,500 yards of it, unless engaging the enemy.
- c "Cover". This would mean that the position of the shipping would be noted and provision be made to intercept any enemy aircraft that might approach it, just as if it were an objective on land.

44. Other provisions of the scheme were that protection in any form would only be given within 40 miles of the coast or the nearest Royal Air Force aerodrome; <sup>(1)</sup> and that, in the absence of special arrangements for protection at dusk or dawn, it would be confined to the period between sunrise and sunset. Finally, it was suggested that Masters and crews should enter into an undertaking never to open fire on an aircraft without making an attempt to recognize it as hostile, and should also undertake that when they were within 40 miles of the coast they would hold their fire in any case until the aircraft was within 1,500 yards.

/45. These

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(1) This was the existing practice.

45. These proposals were still under consideration by the Naval and Air Staffs when, on November 25th, Air Marshal Douglas succeeded Air Chief Marshal Dowding as Commander-in-Chief. At his first meeting with his Group Commanders on November 29th, the new Commander-in-Chief referred to the difficulties that confronted them in this connection. While leaving it to them to make the best arrangements they could, he urged them to consider the merits of standing patrols flown over the coastline off which stood the shipping to be protected.

iv. Summary of Fighter Operations.

46. Meanwhile, as a result of the policy of holding aircraft at readiness rather than flying standing patrols, the number of sorties actually flown for the direct protection of shipping remained low. In November only 402 sorties were devoted to this purpose; but this figure, of course, takes no account of the large number of sorties flown against the mass attacks of November 1st, 2nd, 7th, 8th, 11th and 14th, or the potential flying hours lost through holding aircraft at readiness. Yet, despite this contribution, the unpleasant fact remained that during the month eleven merchant vessels were sunk through the action of enemy aircraft within 40 miles of the coast, and another seventeen damaged. <sup>(1)</sup> Moreover, of the 92 occasions on which attacks occurred or imminent attacks were reported, 81 were in daylight. These were disquieting figures in view of the reliance which was apt to be placed on "the umbrella of the eight gun fighter", even near its rim.

December, 1940 to February, 1941

47. Nevertheless, no substantial increase in the amount of direct protection given to coastwise shipping could be expected so long as the defence of the aircraft industry remained the primary task of Fighter Command, and the  
/place

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(1) In this context "damaged" includes injury to ships' crews

Ibid.,  
min. 63

Ibid.,  
encl. 72A

H.Q.F.C.,  
Forms "Y", Pt. 1

War Cabinet  
Weekly Resume

H.Q.F.C. Forms  
'Y', Pt.1

Group Forms  
540, appendices.

place to be assigned to this secondary task was vague. The form of fighter cover which consisted mainly in holding aircraft at readiness to meet attacks on convoys continued to be given; but the highest number of sorties flown for the direct protection of shipping in any one month between December, 1940 and February, 1941 did not exceed 504.<sup>(1)</sup> Understandably enough, the tendency of the Fighter Groups at this time, especially in the south, was to regard the protection of shipping as a subject of little interest except when it resulted in engagements with the enemy.

48. These efforts were not a very generous response to the appeals made by the naval authorities in October and early November; and the Naval Staff would doubtless have protested at their meagreness if the conditions of early November had persisted. In fact those conditions did not persist. The mass attacks of the opening phase were not repeated after November 14th: thereafter attacks were made only by aircraft operating in small numbers, and the scale of effort declined sharply. In December only four merchant vessels were sunk by enemy aircraft within 40 miles of the coast, and in January only two. In February

/this

(1) A table appended to H.Q.F.C. Form 540 for December, 1941 (appendix J17) gives much higher figures than this for January and February (776 and 1020 daylight sorties, against 350 and 443 quoted at appendix (II)A to the present volume). This table gives month-by-month figures for the whole of 1941. The source of these figures is not stated, although they appear to be based on returns from individual squadrons. In many cases they differ widely from those contained in the day-to-day returns of the Command (Form Y, Pt.1) and the monthly reports on the subject prepared at Headquarters, Fighter Command from April onwards. As the compilers of these monthly reports had every inducement to make them as accurate as possible, and must have had access to all the material used by the compiler of the table, their authority and that of the Command Forms "Y" have been preferred.

War Cabinet  
Weekly Resumé

this figure rose to ten, of which seven were sunk in daylight. In none of these three months did the total number of attacks reported amount to more than two-thirds of that recorded in November.

49. So far as coastwise trade was concerned, then, these three months were something of a lull, though far from a complete one. After a brisk but expensive start, the new offensive seemed at the beginning of February to be doing no more than run under its own momentum. Prisoners-of-war from the anti-shipping organization have described the attitude of the German High Command to their concerns at this stage as "hesitant"; and this hesitancy, if indeed it existed, is not altogether surprising. This arm of the Luftwaffe had yet to prove itself: even its advocates admit that its early successes were due more to the unpreparedness of its victims than the soundness of its methods. An attempt to defeat the opposing air defences by daylight attack had failed in the previous autumn. The night offensive had been under way for several months and showed no sign of producing decisive results. A renewal of the daylight mass attacks on shipping which had begun the offensive in the preceding summer had brought substantial losses. If, in these circumstances, a determined bomber offensive against shipping was logically the next step for the Luftwaffe to take, still it was hardly one to be taken without mature consideration.

#### The Battle of the Atlantic

##### i. The Opening of the Battle

50. Nevertheless it began to be apparent towards the end of February and early in March that a new phase of the

/offensive

(1) According to prisoners-of-war, one of the chief shortcomings of the defence was the scarcity of anti-aircraft weapons in merchant vessels and the lack of protection for gunners where they were provided.

A.D.I.(K)  
Report No. 13/  
1946, para. 35

Ibid., paras  
4 and 31

A.D.I.(K)  
Report No. 13/  
1946, paras.  
31-34

FC/S.23680,  
encl.4A, etc.

War Cabinet  
Weekly Resumé

F.C.I.S.No.300

C.O.S.(41) 130

offensive was beginning. Although there was no resumption of the mass raids on coastwise shipping which had occurred during the first half of November, attacks by single aircraft or small numbers of aircraft became markedly more frequent. Daylight attacks off the Naze and in the waters extending northwards to Orfordness and southwards to Ramsgate were particularly numerous; attacks were also reported elsewhere off the east coast, at the western end of the English Channel, and off the west coast. Sinkings within 40 miles of the coast increased from two in January to ten in February, of which seven were in daylight. Moreover, these signs were accompanied by a vigorous offensive by submarines and aircraft against shipping in Atlantic waters. Simultaneously, a substantial part of the German night effort began to be devoted to minelaying and attacks on ports. Finally, information was received which led the Air Staff to believe that the Germans might be about to increase their anti-shipping force by 200 or 250 aircraft at the expense of their night-bomber force.<sup>(1)</sup>

51. To this period belongs, then, the opening of the struggle which soon came to be called the battle of the Atlantic: a struggle on the one hand to sever, and on the other to retain, the communications of the United Kingdom with the outside world. That this

/battle

A.D.I.(K) Report  
No. 13/1946,  
paras.35-40

FC/S.23680, encl.  
17A; A.D.I.(K)  
Doc.No.676, etc.

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(1) About this time a formation called Fliegerführer Atlantik was set up to co-ordinate air operations against shipping in conjunction with the German Navy. According to prisoners-of-war the forces at its disposal in the Spring of 1941 comprised a Gruppe of F.W.200s, two Gruppen each of Ju.88s and He.111s, and a Gruppe of He.115 seaplanes. About 180 aircraft altogether. Some of these units were occasionally diverted to other purposes. But it is known (although these prisoners did not say so) that other units, hitherto used mainly for the bombing of land targets, now began to be used on frequent occasions against shipping.

battle would have to be fought eventually had long been almost certain: the problem for the defenders was to make a correct choice of the moment at which they must begin to concentrate their energies upon it, even to the exclusion of other tasks.

ii. Changes in Allied Strategy and Deployment,  
February, 27th to March, 12th, 1941

52. In the opinion of H.M. Government, the menace of the U-boat and the F.W.200 had grown so great that this moment had now come. At a meeting of the Chiefs of Staff Committee on February 27th, over which he presided in his capacity as Minister of Defence, the Prime Minister announced a decision to give "absolute priority" to the protection of shipping in the north-western approaches.

53. In consequence of this announcement, the Chiefs of Staff reached at this meeting and another held later in the day, a number of decisions which affected the air defences more or less directly. Among the most important of these decisions were:

- (a) To move a substantial number of naval escort vessels (sloops and A.A. destroyers) from the east coast to the north-western approaches.
- (b) To expedite work on the aerodromes under development in northern Ireland and the Hebrides, if necessary by using service labour.
- (c) To strengthen the forces available to Coastal Command in those areas by various means, including the transfer of squadrons from the east coast and the assumption by Bomber Command squadrons of some duties previously discharged by Coastal Command squadrons.<sup>(1)</sup>

(d) To

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(1) As part of this plan, the long-range fighter squadron at St. Eval was to go to northern Ireland and that at Dyce to Wick. (See paras. 37-41, above.)

C.O.S.(41)  
73rd Mtg.

C.O.S.(41)  
73rd & 75th  
Mtgs. and  
annex d.  
28.2.41

- (d) To provide 200 Bofors guns and crews as anti-aircraft weapons for merchant ships, withdrawing 100 from A.A. Command and finding the rest from immediate production.
- (e) To give the Admiralty all the machine-guns and crews it could use for this purpose, as fast as it could take them up.

54. The effect of certain of these measures was to provide additional escort and protection for convoys in the north-western approaches, at the expense of those off the east coast. It was therefore necessary that Fighter Command should supply additional "watch and ward" for the latter; and on February 28th the Air Staff drew the attention of the Command to this need and directed that it should be met, even, if necessary, at the expense of the daylight offensive, the training programme, and the immediate ability of the Command to repel mass attacks in the south-east. At the same time they mentioned the possibility that measures which were being taken to stimulate the "turn-round" of shipping at certain ports on the west coast might induce the enemy bomber force to pay special attention to those ports.

FC/S.21574,  
encl. 119A

55. In accordance with these directions, the Commander-in-Chief instructed the Fighter Groups to devote a higher proportion of their effort than hitherto to the protection of shipping and ports. In particular, they were to pay special attention to the night defence of Bristol, Liverpool, Manchester, the Clyde, Hull and the Port of London, and to the protection of shipping between Southend and Aldeburgh and in certain other areas and conditions which had proved particularly dangerous in /the past.

Ibid.,  
encl. 132A

(1)  
the past. The system by which fighter protection might take the form of "escort", "protection" or "cover" according to circumstances would continue; but "escort" was to be given more generously than hitherto in the more vulnerable areas, and if "protection" rather than "escort" was given in areas where attacks were likely to be delivered without adequate warning, the fighters giving it were to be kept airborne while there was any risk of attack.

56. The decisions of February 27th were confirmed and amplified on March 6th by a directive issued by the Minister of Defence. In consequence of this directive, the Air Staff wrote formally to the Air Officer Commanding-in-Chief, Fighter Command on March 9th, informing him that his primary task was no longer the defence of the aircraft industry, but that of the Clyde, the Mersey, and the Bristol Channel, and calling upon him to make such changes in the deployment of his resources as this alteration might render necessary.

57. Accordingly, a number of changes were made in the deployment of fighter squadrons and A.A. weapons during the next few weeks, which had the effect of strengthening the defences of the west coast ports, largely at the expense of other parts of the country. With respect to fighter defences, the day defences of the Bristol Channel were strengthened by bringing into operation two single-engined fighter squadrons which had been forming and training for some time past at Filton and Pembrey; (2) those of the Mersey by moving a newly-formed squadron from Acklington to Speke. (3) No addition was

/made

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- (1) Such as the Aberdeenshire coast (especially at dusk); St. George's Channel and the Bristol Channel; and the coasts of East Anglia and Scotland at dusk and during the night. Patrols at "last light" and in moonlight and G.C.I. interception were recommended for trial as means of dealing with dusk and night attacks.
- (2) These were Nos. 118 (Spitfire) and 316 (Hurricane) Squadrons. Orders were given early in March for their advancement to be hastened, and they went into the line between March 23rd and 30th.
- (3) No. 315 (Polish) Squadron, equipped with Hurricanes, moved on March 13th.

FC/S. 21574,  
encl. 145A

Ibid.,  
encl. 151A

H.Q.F.C.  
Orders of  
Battle d. 23  
& 30.3.41  
H.Q.F.C. Form  
"Y", Pt. 1

made to the daylight strength of the Prestwick Sector, covering the Clyde, as the neighbouring Turnhouse Sector (1) was considered adequately strong.

FC/S.21574,  
encl. 151A

58. As for night squadrons, no addition was made to the force in the neighbourhood of the Bristol Channel, which was considered adequately protected by the squadrons already disposed to cover the approaches to the Midlands. The Mersey had hitherto been protected only by two squadrons of single-engined night-fighters; to supplement these, it was now arranged that a flight of Beaufighters, operating from Digby, (2) should reinforce the Ternhill Sector as required. Finally, for the night defence of the Clyde, arrangements were made for No. 600 Squadron, equipped with Beaufighters and Blenheims, and hitherto divided between Turnhouse, Prestwick and Catterick (where one flight was training) to be re-disposed between Drom and Prestwick. (3)

C.O.S.(41)164;  
A.H.B.ID/2/267,  
encl. 6A

59. With respect to A.A. defences, orders were given between February 28th and March 12th for 81 heavy A.A. guns to be moved to the west coast ports. Of these, 58 were to come from other parts of the country and 23 from March production. At all the port areas concerned the defences were to be increased, and in every case but one the additions would be substantial, although only at Liverpool would they bring the number / of guns

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(1) Strictly speaking, Prestwick was not yet a separate Sector, although it was to become so in April. In the middle of March there were four day fighter squadrons in the Turnhouse Sector, (Nos. 602, 603, 43 and 607) of which one (No. 602) was at Prestwick.

(2) No. 29 Squadron (Beaufighters and Blenheims) was already based in the Digby Sector.

(3) This weakened the force potentially available for the night defence of the Tyne and Tees. To compensate for this, No. 68 (Blenheim) Squadron, which was forming and training at Catterick, was ordered to maintain at least one aircraft at readiness each night.

H.Q.F.C. Order  
of Battle d.  
16.3.41

(1)  
of guns up to the planned strength. Where light A.A. was concerned it was necessary, on the other hand, to reduce the number of weapons at the Clyde, in order to find barrels for installation in ships. The balloon defences of the ports, which approximated closely to the planned strength, were reviewed, but up to the middle of March no decision to increase them was reached. In addition steps were taken to improve radar cover over the Irish sea and the gun defences of radar stations in all parts of the kingdom.

In regard to the armament of merchant ships, it was arranged that the air defences should surrender 40 light A.A. weapons in March and 110 weapons be found from March production. During the period up to March 12th, seventeen weapons were installed in ships; in addition the First Lord of the Admiralty announced on March 11th that 1,050 multi-barrel U.P. weapons and 15,000 P.A.C. projectors were on order, and that 1,300 P.A.C. projectors had already been fitted in merchant ships.

61. Measures which concerned the air defences less directly were the raising of Coastal Command's strength in northern Ireland from 56 to 96 aircraft; the move of two Blenheim squadrons of Bomber Command, Nos. 114 and 107, to Thornaby and Leuchars, where they would operate under the control of Coastal Command; and the issue of a new directive to Bomber Command which gave priority to objectives concerned with submarines and F.W. 200 aircraft. Mention has been made already of the decision to move a number of naval

/escort

(1) The planned strength, actual strength early in March, and increases now ordered, were as follows:

| Area        | Planned Strength | Actual Strength | Increase |
|-------------|------------------|-----------------|----------|
| Clyde       | 112              | 67              | 19       |
| Liverpool   | 96               | 84              | 12       |
| Bristol     | 80               | 36              | 28       |
| Avonmouth   |                  |                 |          |
| Swansea     | 48               | 18              | 18       |
| Port Talbot |                  |                 |          |
| Llanelli    |                  |                 |          |
| Cardiff     | 64               | 52              | 4        |
| Barry       |                  |                 |          |
| Newport     |                  |                 |          |

S.3562/I,  
encl. 68A-72A

A.H.B.ID/2/267,60.  
encl. 6A.  
A.H.B.ID/2/267,  
encl. 5A

Ibid.,  
encl. 6A

A.H.B.ID/2/267,  
encl. 6A

A.H.B.ID/2/266,  
passim

escort vessels from the east coast to the north-western approaches; and to the intention to hasten the "turn round" of ships in port. Arrangements were also made to accelerate repairs to damaged ships. Attempts to hasten the completion of aerodromes in northern Ireland and the Hebrides came up against various difficulties and some of the aerodromes were not ready for many months.

iii. Further Measures and Proposals

(a) The Shipborne Fighter

62. The effect of these measures was to increase the protection that could be given to shipping in the north-western approaches against surface, submarine, and aerial attack, and to ports on the west coast against the last of these dangers. To some extent, this was done at the expense of shipping and land objectives elsewhere.

63. The Naval and Air Staffs, however, were not satisfied that these measures alone were adequate for the purpose envisaged. In the previous November the Air Staff had estimated the size of the long-range fighter force that would be needed to protect shipping in the north-western approaches at a minimum of three squadrons.<sup>(1)</sup> Since that time, different strategic concepts on both sides had added to the magnitude of the threat and multiplied the concern with which it was viewed. True, the resources of the defender had grown, too; and a recent decision to add the Beaufighter to the equipment of Coastal Command would give that Command a long-range fighter which was capable of dealing with the fastest German bombers then in service. But it now appeared that, even with several squadrons of

/Beaufighters

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(1) See para. 34, above.

C.O.S.(41)  
130;W.P.  
(41) 59

C.O.S.(41)  
75th Mtg.  
(annex)

C.O.S.(41)  
130

Beaufighters, to protect the convoys whenever and wherever they were threatened would be impossible, not only because the number of Beaufighters likely to be available was inadequate, (1) but because some of the areas where attack was possible were out of reach. Nor was it to be expected that static anti-aircraft weapons mounted on the unstable platform of a ship at sea would ever provide a complete defence. What other means of protection remained?

64. In the opinion of the Air Staff the answer to this problem was the shipborne high-performance fighter. In the words of a note submitted by the Chief of the Air Staff to the Chiefs of Staff Committee on March 3rd:

Ibid.,

"I am convinced that neither shore-based  
"aircraft in the numbers that we can hope  
"to provide in the next six to nine months  
"nor gun armament can secure our shipping  
"in the Atlantic against the scale and type  
"of long-range air attack that we must now  
"expect..... The only method of pro-  
"tection likely to be effective..... is  
"the shipborne high performance fighter  
"operating from specially converted ships  
"which must accompany every convoy in the  
"danger area. I urge that these ships.....  
"should be given the highest possible priority."

65. This suggestion was not a new one. As a result of the consideration which it had already received from the Naval and Air Staffs, three ocean boarding vessels were already being fitted with catapults for launching aircraft and the possibility of equipping other vessels of more than 4,000 tons to carry catapult fighters was being examined. This exploratory work now received fresh impetus, with the result that on March 11th the First Lord of the Admiralty

C.O.S.(41)130;  
C.S.8955,  
encl. 3A

A.H.B.ID/2/267,  
encl. 5A

/was

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(1) It was calculated that at least eight squadrons would be needed to maintain a continuous escort of four aircraft for one convoy or independent vessel throughout the hours of daylight in summer at an average distance of 420 miles from base. On most days there were four convoys (to say nothing of six to ten vessels not in convoy) in the danger zone, so that continuous patrols would have required a force at least two or three times as great as the whole Beaufighter programme for Fighter and Coastal Commands up to September 1941, which stood at 13 squadrons.

was able to announce that four ocean boarding vessels with the necessary modifications were expected to be in service within a few weeks, and that 20 sets of rocket take-off gear had been ordered for installation in merchant vessels then under construction. "We feel," he added, "that the aim should be 200 such vessels."

66. During the next few weeks there was much discussion of this figure and also of the number of aircraft and pilots required for the project. At one time it was suggested that as many as 600 fighters would be needed; while there were strong arguments in favour of embarking two pilots in each modified ship. Eventually it was agreed that, as a start, 50 merchant vessels of approximately 9,000 tons should be modified in such a way as not to interfere with their ability to carry cargo, and that only one pilot could be spared for each. In addition to the pilot, each vessel would carry one Hurricane aircraft, Mark I; a small maintenance crew; and a supply of spares. It would be equipped with rocket take-off gear, and with radar and R/T equipment which would enable the pilot to be directed towards an approaching enemy aircraft by a controller in the ship, who would be a naval officer and would be called a "Fighter Directing Officer". Aircraft, pilots, maintenance personnel and spares were to be provided by the Royal Air Force, which would also train the Fighter Directing Officers. With minor exceptions, the remaining personnel and facilities would be provided by the Royal Navy and the Ministry of Shipping.

67. These 50 "Catapult Aircraft Merchant Ships"; or CAM ships, would ply their normal trade and fly the red ensign. In addition, there would be the vessels /which

A.H.B.ID/2/  
266, passin

Admiralty Paper  
D.E.M.S./C.I.C./  
91/53; C.S.8955,  
encl. 13A

which the Admiralty had already adapted or begun to adapt to carry catapult fighters of the Fleet Air Arm. These, together with the auxiliary aircraft carrier "Empire Audacity", would fly the white ensign and would operate continuously in the danger area, accompanying outward-bound and inward-bound convoys in turn. Thus, some convoys would enjoy the protection for part of their voyage of two or more ships each capable of catapulting at least one aircraft; and in this case a co-ordinating control would be exercised by the vessel carrying naval aircraft or, if there were none, by whichever CAM ship might be designated by the Commodore of the convoy.

68. Obviously, once an aircraft had taken off, it could not return to the ship: at the end of his patrol the pilot would either bale out, alight on the sea, or make for an aerodrome on land.

69. In accordance with this programme, the Merchant Ship Fighter Unit began to form at Speke early in May, 1941 under the Command of Wing Commander E. S. Moulton-Barrett. The new unit was placed in No. 9 Group, Fighter Command. Its establishment comprised a headquarters and practice flying flight at Speke; two mobile erection parties; and 50 ship detachments to provide for the needs of the 50 merchant vessels which were expected to be in service by September. Sixty Hurricanes were made available for conversion early in May. It was intended that ultimately there should be 200, of which 50 would be held at a pool on the far side of the Atlantic. In August, 1941 an organisation for this purpose was set up at Dartmouth, Nova Scotia.

70. The new unit carried out its first trial launch from a merchant vessel on May 31st, when a Hurricane piloted by Pilot Officer H. J. Davidson was launched from S. S. "Empire Rainbow" at Greenock and landed at Abbotsinch. The occasion only just escaped being disastrous, for the

/aircraft

M.S.F.U.  
Form 540

D.G.O.(0.2)  
Paper No.  
W.2298 d.  
1.5.41  
(M.S.F.U. Form  
540, appendix)

A.H.B.ID/2/266,  
encl. d.8.5.41

Report by F/Lt.  
Linney d.  
27.1.42(M.S.F.U.  
Form 540,  
appendix)

Report by W/C  
Passmore d.  
2.6.41 (M.S.F.U.  
Form 540,  
appendix)

Postagram  
M.S.F.U. - No.9  
Group d. 3.6.41

M.S.F.U.  
Form 540

Ibid.

Ibid.

Report by Sector  
Int. Officer,  
Speke, no date  
(M.S.F.U. Form  
540, appendix)

M.S.F.U. Form  
540 and  
appendices

C.S. 8955,  
encl. 92B

M.S.F.U.  
Form 540;  
S.9660, encl.  
86B

M.S.F.U.  
Form 540 and  
appendices.

aircraft swung badly to port and one wing touched the water; but this was due to the human factor and not to any defect in the method. Further trial launchings were made without mishap, and early in June crews began to go to sea on operational service. (1) Despite the many practical and administrative problems involved in this marriage of two elements, the scheme worked well, although it was not until November 1st that a pilot of the unit came into contact with the enemy. On that day Flying Officer G.W. Varley, flying a Hurricane launched from S.S. "Empire Foam", intercepted a Focke-Wulf 200 some 650 miles west of Achill Head. The enemy aircraft disappeared in a bank of cloud before it could be engaged, and at the end of a patrol lasting nearly two hours, Flying Officer Varley baled out from 3,000 feet and was picked up by the destroyer H.M.S. "Broke" after being in the water for about four minutes. No further interceptions by pilots of the Merchant Ship Fighter Unit were recorded in 1941. (2)

71. The developments for which the Admiralty alone was responsible proceeded on a parallel course. The first trial launch from a merchant vessel conducted under naval auspices was at Bangor Bay, near Belfast, on May 17th, when a Hurricane was successfully launched

/from

(1) The first crews embarked were Flying Officer A.R.M. Cambell (pilot), Sub-Lieutenant O.H. Pope (Fighter Directing Officer), Corporal Banner and Aircraftmen Bragg, Wrightson and Smith in S.S. "Empire Moon"; and Pilot Officer H.J. Davidson (pilot), Sub-Lieutenant D.E. Wilson (Fighter Directing Officer), Corporal Wolfenden, Leading Aircraftman Howarth and Aircraftmen Chambers and Burgess in S.S. "Empire Rainbow".

(2) The unit remained in existence until early in September, 1943, when the changed strategical and tactical situation led to its disbandment. Offshoots were opened at Archangel and Gibraltar in 1942 and towards the end of that year the pool in Canada was closed. To the credit of the unit must go a number of successful interceptions on various convoy routes in 1942 and 1943, and a deterrent effect throughout its life which cannot be precisely assessed but was certainly important.

from S.S. "Michael E.", the first merchant ship to be equipped with the type of launching gear which became standard in the CAM ships. By the end of the first week in June the four fighter catapult ships "Pegasus", "Springbank", "Maplin" and "Ariguani", flying the white ensign, were all in service and the first operational flight from one of these ships had taken place. (1) On August 3rd Lieutenant (A) R.W.H. Everett, R.N.V.R., flying a Hurricane I of No. 804 Squadron catapulted from H.M.S. "Maplin", attacked a Focke-Wulf 200 some 400 miles south-west of Cape Clear, and saw it go into the sea.

C.S.8955, encl. 101A; C.S.8955/II, encl. 3A

Report by Lt. Everett d. 18.8.41 (M.S.F.U. Form 540, appendix)

72. Thus it is fair to say that by the winter of 1941 the plan of putting high-performance aircraft into modified or converted merchant ships had proved its utility. In relation to the air defences its main significance lies, however, in the fact that it represented a substantial diversion of men and material from the direct defence of the United Kingdom and coastwise trade. (2)

A.H.B.ID/2/266, passim

(b) Bases in Eire

73. A further requirement of the Naval and Air Staffs was the establishment of bases in Eire. Their views had the concurrence of the General Staff; and in March the Chiefs of Staff presented to the War Cabinet a memorandum in which they declared that the increased protection required for Atlantic trade could "only be given by operating our "naval and air forces from bases in Eire nearer to the area "of enemy attack".

W.P.(41) 59

74. The memorandum went on to outline more precisely what would be involved. Clearly, not merely anchorages for ships, but also aerodromes, an air defence system, and /troops

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(1) The sortie was uneventful and the pilot landed without mishap in Ireland.

(2) For Fighter Command the formation of the Merchant Ship Fighter Unit meant, in broad terms, the sacrifice of two fighter squadrons.

W.P.(41) 64

troops to defend all these things, would be needed; so that, as the Secretary of State for Dominion Affairs pointed out in commenting on the proposals, something approaching a military occupation would be entailed. To obtain the consent of the Eireann Government to such a measure would clearly be a matter of great difficulty; and it proved impracticable to give the Chiefs of Staff the facilities for which they asked.

(c) Further addition to A.A. defences in the West

75. We have seen that, as an immediate consequence of the directions given to the Air Officer Commanding-in-Chief, Fighter Command at the end of February and early in March, orders were issued for the addition of 81 heavy A.A. guns to the defences of west coast ports. At the same time some light A.A. weapons were taken from the Clyde and elsewhere for installation in merchant vessels.

76. At a meeting of the Chiefs of Staff Committee on March 10th, the First Sea Lord again drew attention to the great importance of the west coast ports; and in order that there should be no doubt that the defences of these ports were adequate and disposed to the best advantage, the Air Officer Commanding-in-Chief, Fighter Command, who was present, thereupon undertook to send officers to visit the ports and report on the situation after consulting the local Commanders. It was agreed that if the reports of these officers disclosed a need for further action, the matter should be reviewed.

77. The main conclusion which emerged from the visits of these officers was that the heavy A.A. defences of the west coast ports ought to be substantially increased. In two cases the raising of the

/planned

A.H.B.ID/2/267,  
encl. 10A;  
C.O.S.(41)  
99th Mtg.

C.O.S.(41)  
216  
(annex)

planned scale of defence was recommended, and in every case it was urged that the actual strength of the defences should be brought up to the planned scale without delay. The detailed recommendations submitted by the Air Officer Commanding-in-Chief, Fighter Command on March 21st were as follows:

| <u>Area</u>                     | <u>Scale<br/>Already<br/>Approved</u> | <u>Scale<br/>Now<br/>Proposed</u> | <u>Guns in<br/>Position or<br/>under order<br/>to move</u> | <u>Increase<br/>needed to<br/>meet new<br/>proposals</u> |
|---------------------------------|---------------------------------------|-----------------------------------|--|--|
| Clyde                           | 112                                   | 144                               | 88   | 56   |
| Liverpool                       | 96                                    | 112                               | 96   | 16   |
| Bristol )                       | 80                                    | 80                                | 68   | 12   |
| Avonmouth )                     |                                       |                                   |  |  |
| Swansea )                       | 48                                    | 48                                | 36   | 12   |
| Port Talbot )                   |                                       |                                   |  |  |
| Llanelly )                      |                                       |                                   |  |  |
| Cardiff )                       | 64                                    | 64                                | 56   | 8  |
| Barry )                         |                                       |                                   |  |  |
| Newport )                       |                                       |                                   |  |  |
| <u>Total increase required:</u> |                                       |                                   |  | <u>104 guns</u>  |

78. The Commander-in-Chief proposed to find the sixteen additional guns required for Liverpool by withdrawing eight each from Slough and the Derby-Nottingham area; similarly, he proposed to strengthen the defences of Swansea and Cardiff at the expense of other parts of Wales. But the greatest number of guns he could find in this way was 28. This would leave 76 more to be found; and these could not be taken from other parts of the country without seriously weakening the defence of areas which were still important. Already 58 guns had been withdrawn from such vital centres as Birmingham and Sheffield; and the Commander-in-Chief considered it highly desirable that these reductions should be made good as soon as possible. He therefore urged that, for the time being, all heavy A.A. resources from production should be allocated, without exception, to the air defences. (1).

/79.

(1) It had been agreed by the Chiefs of Staff on March 15th that overseas demands for A.A. guns would have to take second place; but this suggestion went much further.

79. The importance and urgency of this claim was indisputable; but against it had to be weighed the requirements of other theatres of war, of ports abroad and customers in other countries. For this reason the Chiefs of Staff Sub-Committee on the Allocation of Active Air Defences, whose duty it was to consider the Commander-in-Chief's proposals, while endorsing his plan for the reinforcement of the west coast ports, qualified their support of his claim to a monopoly of production by a reference to other needs. In practice this meant that, as in the past, the proportion of total production to be allotted to the air defences would be a matter for decision from time to time by the Chiefs of Staff, in the light of the advice tendered by the Sub-Committee. Subject to the approval of the Chiefs of Staff, the air defences were already due to receive 68 guns out of April production; and it was expected that their allocation for May would be about the same.

C.O.S.(41)216

S. 6456/I, encl.  
d. 31.3.41 (un-numbered)

80. These recommendations were approved by the Chiefs of Staff Committee on April 2nd. The final allocation to the air defences out of April production amounted to 72 guns (including four dual-purpose guns) so that only four guns would have to be found from other areas in addition to the 28 which the Commander-in-Chief already proposed to find in this way.

C.O.S.(41)  
119th Mtg.

Fighter Operations, March to December, 1941

81. Meanwhile the Fighter Groups were responding vigorously to the new instructions given to them early in March.  
(1)

82. The number of sorties flown in daylight by the whole of Fighter Command for the direct protection  
/of shipping

FC/S.23680,  
encl. 4A

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(1) See para. 55 above.

of shipping in February was 443. This was eight per cent of the total defensive effort of the Command by day. In March the corresponding figure rose to 2,103 sorties, or eighteen per cent of a total which was more than twice that recorded in the previous month. At the same time the enemy also increased his effort and in March sank 21 merchant vessels within 40 miles of the coast in daylight, as against seven in February. (1) Qualitatively, this was the zenith of the German offensive against coastwise shipping: besides the 21 vessels sunk in daylight, three were sunk at night, while by day and at night another 32 and twelve respectively were damaged. By exploiting weather conditions which were often unfavourable to our fighters, the enemy made the task of the defence extremely difficult; and a disturbing feature of the month's activity was that about one fifth of all the attacks recorded were delivered while fighters were close to the ship attacked; and a few whilst it was actually being escorted.

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FC/S.23680,  
encl. 4A

83. Clearly, then, it behoved the fighters to do more and better. They responded by devoting 7,876 sorties, or 49 per cent of the total defensive effort in daylight, to the direct protection of shipping in April. Several squadrons in No.10 Group each spent more than 1,000 hours of flying time on the protection of shipping during this period of 30 days. That these efforts were not made in vain is demonstrated by a sharp drop in sinkings from 21 in March to ten in April; for although the other defensive measures taken may claim some of the credit for this, it would be unreasonable to deprive the fighters of a substantial share. (2) It is also significant that, whereas

Ibid.,  
encl. 4A

War Cabinet  
Weekly Resumé

FC/S.23680,  
encl. 10A

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(1) An analysis of each month's operations and results is at appendix (II)A.

(2) Most of the senior officers of the Luftwaffe who have been interrogated about the campaign against shipping have, however, agreed in stating that the turning point was "the Allied decision to armour-plate gun positions on merchant vessels".

A.D.I.(K)  
Report No.13/  
1946, para.34

Ibid.,  
encl. 14A

less than a fifth of the attacks reported in March. It occurred at night, in April this proportion rose to more than a third. "You will be glad to hear," said Air Marshal Douglas in a letter to the Chief of the Air Staff, "that for once the Navy is quite pleased with Fighter Command."

Ibid.,  
encl. 10A

84. But if the situation at the end of April gave some ground for satisfaction, it gave none for complacency. Far too many attacks were still being made on ships which were actually being escorted or had fighters close at hand; while the number of occasions on which German aircraft were able to approach a convoy without detection by the air defences bore witness to the enemy's luck or skill in exploiting the weak links in the radar chain. The remedy for the second of these ills was obvious; and it was hoped that the addition of new radar stations and the modernisation of others during May would provide it. In regard to the first, it was suggested that the more careful routing and shepherding of convoys would make it easier for fighters to keep them under observation; and that measures should be taken to enable ships to draw the attention of patrolling fighters to the whereabouts of enemy aircraft.

FC/S.20350,  
encl. 1A-13A

Ibid.,  
encl. 28A

85. The obvious way of arranging for this information to be given was to fit R/T into ships and allow them to transmit to the fighters on a pre-arranged frequency. Such an arrangement had been suggested in July, 1940; but at that time Fighter Command dismissed it as impracticable. In December of that year, however, they authorised No. 14 Group to carry out trials in conjunction with the Commander-in-Chief, Rosyth, on condition that transmissions

/were

were limited to the passing of information and that no attempt was made to control the fighters.<sup>(1)</sup> These trials were carried out between December, 1940 and February, 1941; but they were inconclusive, and since the Admiralty was anxious that the matter should be pursued, it was decided early in March that further trials should be made. As a result, it became clear early in April that the scheme was practicable, and the suggestion was then made that it might be extended to escort vessels accompanying convoys in the Irish Sea as well as off the east coast from Rosyth to the Nore. Nevertheless certain operational, as well as technical, problems still remained to be solved. A conference to discuss these was held at the Air Ministry on May 17th, at which agreement was reached between the Admiralty, the Air Ministry and Fighter Command on the principles to be observed; but it was not until the middle of June that a detailed plan could be worked out and the necessary instructions issued to the various naval and air formations concerned. Even then equipment of the escort vessels with R/T sets still remained to be done; and progress in this respect was slow.

86. No appreciable advantage, therefore, was derived from this scheme in May, or indeed for some months to come.

On the other hand, radar cover was substantially improved and a rather smaller proportion of attacks were delivered without warning than in April. In this month Fighter Command's effort reached its peak, with 8,287 sorties, which

/was

(1) There were strong objections to the scheme on the ground that it would cut across the principle which placed the control of all active elements of the air defences in the hands of the A.O.C.-in-C., Fighter Command. Hence when the scheme was ultimately adopted, it was necessary to emphasize that the R/T sets in the ships were for passing information not for controlling fighters. This objection did not apply to the CAM ships (see paras. 64 - 72, above) which operated outside the area normally covered by the air defences, and carried Fighter Directing Officers trained by Fighter Command.

FC/S.20350,  
encl. 40A

Ibid., encl. 31A,  
46A, min. 42

Ibid., encl. 52A,  
57A

Ibid., encl. 60A,  
63A

Ibid., encl. 66B,  
72A

Ibid., encl. 83A,  
84A

Ibid., encl. 100A,  
101A, min. 101

FC/S.23680,  
encl. 26A

FC/S.20350,  
min. 19 - 24

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was slightly more than half the total defensive effort in daylight. The German effort declined substantially and sinkings in daylight fell from ten to seven. The tendency towards night attacks which had been noticed in April was intensified, considerably more than half the attacks reported in May being made under cover of darkness or twilight.

FC/S.23680,  
encl. 39A

87. In June the Command devoted a still higher proportion of its defensive effort to the protection of shipping, although the number of sorties flown was smaller in the absolute, the defensive effort as a whole being somewhat reduced in conformity with the alterations in strategy which followed the re-deployment of the Luftwaffe in preparation for the campaign in the east. Again the German effort declined; but the decline was by no means proportionate to the general reduction of his offensive on the western front; and it was estimated that in June seventy per cent of his whole offensive effort by day went into operations against shipping. Only three merchant vessels were sunk in daylight, as against seven in May, but the number of daylight attacks reported showed no appreciable decrease, and attacks at night were both more numerous and more successful. By the end of June only five naval escort vessels had been fitted with R/T, so that the gap in the defences which made it possible for ships to suffer attack while fighters were close at hand was still unbridged. Furthermore, although four new radar stations came into service towards the end of June and the equipment of others was substantially improved, about a third of the attacks reported occurred without previous warning. The waters off the east coast

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FC/S.23680,  
encl. 39A

/between

between Berwick and Cromer were the scene of more than half the attacks recorded within the area for which Fighter Command were responsible; in addition, nine attacks were reported off the west coast of Scotland, in positions which short-range fighters could not reach because, although they were all within 40 miles of the shore, there were no aerodromes in that part of Scotland suitable for high-performance fighters.<sup>(1)</sup>

Ibid.,  
encl. 39B

88. In view of the rise in the number of attacks made at night, attempts were made in June to give increased fighter protection to convoys after dark, sometimes even by means of standing escort, although the feasibility of this method had always appeared doubtful. It was found that the presence of a standing escort at night conferred little benefit and tended to embarrass the A.A. defences of the convoys. Fighter Command therefore recommended early in July that fighter escorts always be withdrawn at night and that after dark the convoys rely on their A.A. weapons and on the protection given indirectly by night fighters in their attempts to intercept the aircraft responsible for the attacks. Recent experiments in the technique of night interception at low altitudes might make this form of indirect protection more effective in the future.

Ibid.,  
encl. 39A

89. In July only one merchant vessel was sunk in daylight within the area covered by Fighter Command and only one damaged. During the remaining five months of the year four vessels were sunk in daylight, and the average number damaged each month was three, as against seventeen during the first six months of the year. Since the percentage of all daylight attacks which failed rose from 58 in the

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Ibid., also  
FC/S. 23680,  
encl. 10A

/first

(1) These nine attacks are not included in the figures at appendix (II)A. The practice throughout has been to include only attacks in areas within 40 miles of the coast and of a Royal Air Force aerodrome. For another aspect of this question, see Part I, paras. 27 - 32.

first half of the year to 73 in the second, it seems clear that this change was not due solely to the reduction in the scale of attack which accompanied the opening of the campaign in the east, nor to the enemy's deliberate preference for night attacks. It can therefore be claimed that by the end of the summer a combination of improved A.A. defences and resolute fighter action, in conjunction with the other measures taken, had gone far to answer the problem of protecting coastwise trade by day. At the same time it must be observed that this result had been achieved by efforts which would hardly have been feasible if heavy attacks on land objectives by the Germans had continued.

90. There remained the problem of protecting ships at night and, above all, at dusk. In July 68 attacks between 30 minutes after sunset and 30 minutes before sunrise were reported; seven merchant vessels were sunk and 20 damaged. In the remaining five months of the year these attacks were neither so numerous nor so destructive; nevertheless 23 ships were sunk or damaged during the night phase in September and 25 in November, while in no month did this figure fall below thirteen. At the height of summer, darkness is a relative term; and in spite of the arguments which had recently been advanced in favour of withdrawing fighter escorts at dusk, in practice this was not always done. But neither direct protection, nor improved A.A defences, nor new methods of interception provided a complete answer to the problem; and for the rest of the year attacks at dusk, especially off the coasts of Northumberland, Durham and East Anglia, continued to cause anxiety. Furthermore, as winter approached, new methods of attack, in daylight, under cover of weather conditions which often hampered

/fighters

FC/S.23680,  
encl.49A

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FC/S.23680,  
encl.49A

FC/S.23680,  
encl.58A,65A,  
70A;  
FC/S.27005,  
encl.7B, 13A

fighters, together with the introduction of the Do.217 bomber and a threat of increased torpedo-bomber activity in the future, all helped to remind the defenders that the battle was not yet over.

PART THREE

THE DAYLIGHT ATTACK AND DEFENCE OF THE  
UNITED KINGDOM

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UNITED KINGDOM

Phases of the Attack

1. The German daylight air offensive against the United Kingdom between the beginning of November, 1940 and the end of the following year falls roughly into two periods or phases of equal length. The first, extending until the end of May, may be called the period of transition; the second, from the beginning of June onwards, the period of blockade. During the period of transition the average monthly effort in daylight, according to the best estimates available up to the time of writing, amounted to about 2,500 sorties, and roughly 58 per cent of the total effort was devoted to operations against shipping. During the period of blockade the monthly average was only 634 sorties, and operations against shipping accounted for about 66 per cent of the total. (1)

A.W.L.S.  
Statistics,  
1945

2. This division into two phases is valid only in a broad sense. During the period of transition the German daylight offensive which had reached its climax in September, 1940 and the major night offensive which had begun on September 7th gave place gradually to a policy of blockade, dictated not only by the failure of those two offensives to attain their objectives, but also by the withdrawal of the bulk of the Luftwaffe to the eastern front. It follows from this that the policy of blockade really began before the period of transition was over, although the extent to which it was taking possession of the field was at first concealed by the continuance of other operations, partly as a deliberate measure of deception and partly, perhaps, through the mere effect of inertia and uncertainty in the higher levels of the Luftwaffe. Moreover, even after the beginning of June

A.D.I. (K)  
Report No.12/  
1946, para.65.

Ibid., para.4,  
etc.

/operations

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(1) See also appendices (III) A, (III) B, and (II) A.

operations which did not contribute directly to the blockade continued to be carried out occasionally, although this tendency was more noticeable at night than during the day.

### The Period of Transition

#### i. Escorted Raids and Fighter Sweeps

3. During October, 1940 attacks by long-range bombers with fighter escort almost ceased. Instead, the enemy sent over numerous fighter formations, sometimes accompanied by a few fighter-bombers, to sweep over south-eastern England at heights up to 30,000 feet or more. In order to intercept these raids it was found necessary to maintain standing patrols over Kent whenever they were likely to be made. In the engagements which resulted No. 11 Group claimed the destruction of approximately four German aircraft for each of their pilots lost.
4. In November the enemy continued to make these fighter and fighter-bomber sweeps, although at rather lower altitudes, perhaps because of the extreme cold and lack of oxygen at high altitudes or to avoid making condensation trails. Some of the sweeps were used as diversions to cover the attacks by escorted long-range bombers and dive-bombers on ports and shipping which began on November 1st. Italian bombers and fighters shared in some of these operations. (1)

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(1) The presence of Italian bombers and fighters among the attacking forces was first reported by the defences on Nov. 1st. On Nov. 11th some ten B.R.20 bombers and 40 C.R.42 fighters, unaccompanied by German aircraft, were intercepted off Harwich. Italian bombers appeared again on Nov. 17th, when some ten B.R.20s, strongly escorted by what seemed to be German fighters, attacked objectives north of the Thames Estuary. Finally, on Nov. 23rd about 30 C.R.42 fighters, accompanied by about the same number of aircraft reported as Me.109s swept over east Kent. The defences claimed the destruction of nineteen Italian aircraft altogether, without suffering any casualties attributed to Italian fighters. These operations seem to have been undertaken for a political motive, on Italian initiative. According to prisoners of war an expeditionary force consisting of some 80 B.R.20 bombers of Nos. 13 and 43 Stormi and 60 C.R.42 and G.50 fighters of No. 56 Stormo was sent from Italy to Belgium for the purpose between September 26th and October 4th. The bombers were based at Melsbroeck and Chievres, the fighters at Eecloo and Maldeghem. Some of the bombers seem to have taken part in at least one night raid.

Report  
11G/493 d.  
7.11.40

H.Q.F.C. &  
H.Q.No.11 Gp.  
Forms.540 and  
appendices

A.D.I.(K)  
Report No.  
916/940

Report 11G/  
493 d.  
30.11.40

5. These changes facilitated the task of the defenders who had also profited by the experience gained in October; and in November No.11 Group claimed the destruction of 164 German and Italian aircraft for the loss of only nineteen pilots. This was the highest proportion of claims to losses recorded by the Group in any month of 1940. The best results were achieved by single squadrons, not by wings of two or three squadrons; but the No.12 Group wing, which had done so well in September and achieved little in October, reinforced No.11 Group on nineteen occasions in November and claimed the destruction of nine enemy aircraft for the loss of two pilots.

A.D.I.(K)  
Report No.373/  
1945, para.155

Report 11G/  
493 d. 3.1.41,  
etc.

6. After this the Luftwaffe seized the opportunity afforded by the winter months to rest that part of its forces which was not needed for the night offensive. It is said that in January and February the entire flying personnel of the fighter Geschwader J.G.26 were withdrawn to Austria for a rest, while their aircraft were overhauled in Germany. Fighter sweeps virtually ceased in the middle of December and were not resumed until the middle of February. Meanwhile the commencement of our own daylight offensive caused the Germans to begin flying defensive patrols over the Straits of Dover and the coastline from the mouth of the Scheldt to Cherbourg.

7. When fighter sweeps were resumed in February they were on a much smaller scale than in the previous November. The average number of German offensive fighter sorties recorded each day by the defences during the second half of February, 1941 was 26, as against 100 in November, 1940. Operations on much the same scale continued in March, April and May.

8. Fighter-bombers attacked fighter aerodromes in Kent on a number of occasions in February, March, and May, usually diving to 1,000 or 2,000 feet for the purpose. During this period Manston, Hawkinge and Lympne all suffered attacks of this kind. (1)

/9.

C.O.S.(41)  
342

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(1) Attacks of all kinds, by day and at night and by bombers as well as fighters, in April and May totalled nearly 300. See also para.12, over, and footnote thereto.

9. These small-scale operations between February and May gave the defenders no chance of using the large wing formations with which it had been intended to repulse the German daylight offensive in the spring. On the other hand they raised no special problem of defence which had not already come to light in the previous autumn.

ii. Bomber-Reconnaissance and "Pirate" Raids

a. General Characteristics

10. Throughout the period of transition these fighter and fighter-bomber operations were accompanied by a fairly steady volume of activity by aircraft of bomber type which operated without fighter escort and often with the assistance of cloud-cover. Reconnaissance flights were made over the sea to obtain information about the weather and the movements of our shipping; and also over the land, where the appearance of a German reconnaissance aircraft over a town was often the prelude or sequel to a night attack.

11. Sometimes aircraft which set out to look for shipping ended by dropping bombs on land; and sometimes aircraft of long-range bomber units set out deliberately to attack specific objectives in this country. These raids by unescorted bombers, flying singly or in very small formations and making individual attacks on land objectives, may conveniently be called "pirate" raids - a term which the Germans themselves used for sorties of this kind, in which the initiative of pilots and crews themselves played a large part from the planning stage onwards.

12. The favourite objectives for these "pirate" raids were aerodromes - on which a number of low-level attacks by bomber aircraft were made in the winter and spring of 1940-41<sup>(1)</sup> - and aircraft factories.

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(1) Aerodromes were attacked both by day and at night by bombers, day fighters and night fighter ("Intruder") aircraft. On one day in February alone 22 low-level attacks on airfields in East Anglia were made in daylight, and between April 1st and May 29th, 283 attacks by day and night were recorded. At this time the whole question of the defence of aerodromes was under review in connection with the larger issue of defence against invasion and air-borne attack. (See Introduction to the present volume). In the meantime, arrangements were made for two small H.A.A. "Circuses" to tour aerodromes in the areas of Nos. 10 and 12 Groups.

13. "Pirate" raids, if carefully planned and executed so as to take advantage of every favourable circumstance of topography and weather, were extremely hard to counter. Some of them - especially those directed against aircraft factories - caused great anxiety. Consequently, in March, 1941 the Air Officer Commanding-in-Chief, Fighter Command invited his Group Commanders to pay special attention to the interception of single raiders. (1)

H.Q.F.C.  
Signal C.20  
d. 21.3.41

14. Ever since September 17th, 1939 the defence of the aircraft industry had been the primary task of the air defences. This policy was destined to remain in force until the end of February, 1941, when the intensification of submarine and aerial warfare in the north-western approaches brought a change of strategy. (2) After the collapse of France in June, 1940 it was reaffirmed and the deployment of the defences was modified so as to give the greatest practicable measure of protection to the most vulnerable and important factories. But since supplies of guns and balloons were far short of requirements, it was impossible to give increased protection to the less vital factories as well. Thus, for example, while the static defences covering the Rolls Royce factory at Derby were increased by 24 heavy A.A. guns, eight balloons and twelve Bofor guns, those covering a less important group of factories at Brooklands remained unchanged.

A.H.II H/99,  
enc. 10A

C.O.S.(40)  
475 and 189th  
Mtg.

Part I.,  
paras.

C.O.S.(40)  
475

15. Although approved by the Chiefs of Staff Committee, these arrangements did not satisfy the new Minister of Aircraft Production, Lord Beaverbrook, who pressed for better protection for his factories. The "pirate" raids of the winter and spring increased his anxieties, since they undoubtedly affected the morale of the workers, who already had to undergo the strain of night raids. It was argued that if these men and women were to be expected to work

W.P. (40)  
232

/through

(1) See also paras. 49 - 53, below.

(2) See Part II, paras. 52 - 61, and also para. 35, below.

through "alerts", they must be able to feel complete confidence in the defences.

b. Attack on Rolls Royce Factory, Crewe on 29th Dec., 1940

16. On December 29th, 1940 a "pirate" raider succeeded in reaching and bombing the Rolls Royce factory at Crewe in daylight. Sixteen people were killed, and after the raid 3,000 workers in the factory signed a protest against "the inefficiency of those responsible for our protection from air attack". They complained that, although they had received air raid warnings during attacks on Manchester and Liverpool, when no attack on their factory had followed, on this occasion, when their factory was attacked, no warning had been received; that the attacking aircraft had not been engaged by the defences; and that the balloon barrage had failed to operate.

17. The terms of this protest were not quite fair, since the failure of the defences on this particular occasion was hardly ground for a general charge of inefficiency. Nevertheless enquiry revealed at least one disquieting circumstance.

C.S.7891,  
passim.

18. The raid was made in bad weather. No air raid warning was sounded at Crewe, because it was not the policy to give public warning of the approach of single aircraft except to a number of "sensitive areas", which did not include Crewe. The enemy aircraft was tracked from the time it crossed the English coast on the way to its target, and an adequate number of fighters were despatched to intercept it, but low cloud, rain and poor visibility gave them little chance of success. The aircraft emerged from the clouds close to its target, dived to 50 feet, and quickly regained the shelter of the clouds after making its attack. Thus the heavy A.A. guns at Crewe had no real chance of engaging it, while it happened that the one light A.A. gun which was so sited that it might have done so with success was out of action at the time. Here were plausible, if not entirely convincing, reasons for the failure of the guns and fighters. But why had the balloon barrage, which was supposed to give protection against precisely this form of attack, not

done so? The answer is that at the material time it was close-hauled because of a strong wind and a risk of lightning. Arrangements had been made to warn the Barrage Control Officer of the approach of enemy aircraft; but these arrangements broke down, with the result that he did not get the balloons up in time to forestall the attack. (1)

19. This experience pointed to the necessity of improving the arrangements for keeping Barrage Control Officers abreast of the situation and also - since warning of the approach of enemy aircraft could not be guaranteed on every occasion - to the desirability of accepting some risk of wastage in order to keep balloons flying on all reasonable occasions when there was a risk of daylight attack. In broad terms, the policy now affirmed was to close-haul all except certain coastal balloons at night unless enemy aircraft were about, and to keep all balloons flying during the day unless there were strong grounds for not doing so.

R.A.F. Monograph,  
"Balloon Defences,  
1914-1945",  
Pt. II, pp. 121-  
122

c. Use of A.I. Fighters by Day

20. Even before this the advantages which twin-engined night fighters, equipped with A.I. would have over day

/fighters

R.A.F. Monograph,  
"Balloon Defences,  
1914-1945", Pt. II,  
pp. 112-116

C.S. 7891,  
enc. 14A, 20.

- (1) On the outbreak of war the fundamental policy had been to keep the balloons up all the time. The heavy wastage thus incurred, together with other factors, soon caused this policy to be modified in favour of a system of "barrage control" by which local commanders could keep their balloons close-hauled if the weather was unfavourable and raise them only when danger threatened. After the summer of 1940, barrage commanders were supposed to receive warning of the approach of enemy aircraft in the shape of the plots broadcast over the Fighter Command system, which were to reach them through the local Gun Operations Room. In the present case the Barrage Control Officer (who stood in the shoes of the barrage commander) expected to be told as soon as any enemy aircraft came within 75 miles, this being, according to his understanding, the arrangement he had made with his local G.O.R. The G.O.R. was, however, unable to give this length of warning since (for reasons which are still not clear) it did not receive its first plot in respect of this particular aircraft until the aircraft was 30 miles away. Consequently the Barrage Control Officer did not know that there was a German aircraft coming towards him until he received the non-public "Yellow" air-raid warning through Home-Security channels, which coincided with the receipt of the first plot by the G.O.R. By this time the aircraft was only some eight minutes' flying time from the factory and the action he took was too late to save the situation.

fighters in bad weather had been perceived. (1)

FC/S.22254,  
enc. 5.

Among others, the Inspector General of the Royal Air Force had suggested that attention should be paid to this matter. In December, 1940, it was decided that any Beaufighters which happened to be airborne and in the right place when an enemy aircraft came over in bad weather should, if possible, be used to intercept it.

21. During the next few weeks there were a number of occasions, including the Crewe raid, on which enemy aircraft were able to fly over the country in bad weather without being intercepted. On January 23rd, therefore, Fighter Command instructed Nos. 10, 11, 12 and 13 Groups to consider what could be done to develop the use of A.I. fighters in such circumstances, and shortly afterwards it was arranged that when the weather was unsuitable for interception by day fighters, a Beaufighter should be held at "Readiness" in the Middle Wallop Sector. This scheme produced no positive results during the period covered by this account, but was extended during the period of blockade. (2)

Ibid.  
enc. 10a,  
11.

d. Attack on B.M.R.C. Factory, Grantham on 27th Jan., 1941

22. Another daring daylight attack on a factory, comparable with that on the Rolls Royce Factory at Crewe, was made on January 27th, when two Ju.88 aircraft of the bomber unit III/K.G.30 set out individually to attack the British Manufacturing and Research Company's Factory at Grantham. The crews had been told, quite rightly, that this was the only factory in the United Kingdom engaged in the manufacture of Hispano-Suiza cannon for aircraft.

A.I.1(K)  
Report No.  
31/1941

A.M.Signal  
X.758 d.  
5.2.41; min.  
D.H.O.4465,  
same date

23. The first aircraft did not reach the factory, but dropped its bombs on the outskirts of Grantham, about a mile and a half away. Whether by accident or design this led to a belief in some quarters that the enemy had shot his bolt, and shortly afterwards the Home Guard gunners who were manning the light A.A. guns sited /at

FC/S.22254  
enc. 10A

- (1) Apart from A.I., the twin-engined night fighters had greater endurance and hence a wider choice of aerodromes - an important factor when some aerodromes were fogbound. They were also fitted and their crews trained for making "blind" landings.

- (2) See paras. 49 - 53, below.

A.I.1(K)  
Report No.  
31/1941

at the factory were told that they could stand down. Some of them had actually done so when, a few minutes later, the second aircraft loomed out of the mist of the winter afternoon and approached the factory at a height of 500 feet. In view of the instructions they had just received, those of the gunners who were still at action stations held their fire until the German aircraft was very close and had actually released its bombs. Eleven Hispano guns, nine machine-guns and one Browning automatic rifle then went into action, much to the surprise of the pilot, who believed that he had escaped the attention of the defences and was looking forward to the successful accomplishment of a mission undertaken to signalise his hundredth "war flight".

24. The gunners obtained at least 14 hits with 20 mm. shell and a number with machine-gun bullets on the aircraft, which subsequently made a crash landing in a field near Boston in consequence of the damage thus inflicted.

Tbid.; and  
A.W.A. Report  
No.B.C./G/1

25. This was a valuable achievement, especially as it led to the capture of four prisoners and a new type of German bomb-sight. Nevertheless the factory had been bombed; and there was no escaping the conclusion that the crew of the aircraft had been unluckily not to escape scot-free.

e. Attacks on Industrial Targets, February to May, 1941

26. Attacks on factories and similar targets continued during the rest of the period of transition. Perhaps the most interesting of those made in February was an attack on the British Aluminium Company's factory at Foyers, on the shores of Loch Ness. The aircraft which made it, an He.111, came in over Inverness, flew along the Caledonian canal to its target, and afterwards escaped unscathed.

27. Attacks in March included two in one day on Ransome and Marle's factory at Newark. Both were delivered from heights below 1,000 feet, and although the Lewis guns defending the

/factory

factory fired a total of 2,478 rounds and claimed some hits, both aircraft made good their escape.

28. In April both A.V. Roe's factory at Manchester, and Boulton and Paul's at Norwich were attacked. Two fighters made contact with the aircraft which made the first attack, but lost it in cloud; and although the aircraft was engaged by heavy A.A. guns and a variety of light A.A. weapons, no hits were claimed. In May attacks were made on two factories, but neither caused much damage.

29. Besides these attacks on factories, a number of attacks were made during this period on harbour works and public utility installations.

f. The "Goalkeeper" Scheme

30. At the time of the attack on the B.M.R.C. factory at Grantham, bad weather had hampered the ferrying of aircraft from the aircraft factories, some of which, therefore, were congested with aircraft and were thus particularly vulnerable targets.

31. The Minister of Aircraft Production, who had been making frequent and forceful requests for additional protection for his factories ever since the previous summer, chose this moment to demand overhead protection for each of the principal factories in the form of a Spitfire to be based at the factory aerodrome and flown by a test pilot or Royal Air Force Officer.

32. Such a system of local defence had never been regarded with much favour by the Air Staff or Fighter Command. Clearly, any aircraft provided for this purpose would come ultimately out of the resources available for the general air defence system; and to use any part of these resources purely as "goal-keepers", without reference to the general situation was, on account of its inherent extravagance and because it involved a dangerous dispersion of hitting power, contrary to orthodox doctrine.

Air Chief Marshal Dowding, when Air Officer Commanding-in-Chief, Fighter Command, considered that aircraft used as "goal-keepers" would provide a very inefficient defence even of their own locality,

/and

A.H.B.ID/2/  
243, enc.55A,  
57A

A.H.B.ID/2/243,  
passim

Ibid.,  
enc.63.

Ibid.,  
enc. 21.

and that to have adopted such methods during the battle of Britain would have been disastrous.

"This policy", he said, "was, I believe, one of the reasons for the ineffectiveness of the French fighter force during intensive operations."

33. Air Chief Marshal Portal, writing as Chief of the Air Staff to Lord Beaverbrook in February, expressed similar views when he said:

Ibid.,  
enc. 86a

"The system of local patrols over key points would be a very inefficient and extravagant way of using our fighters and it would also expose our fighter force to defeat in detail."

34. Nevertheless there was something to be said for the

scheme as a means of bolstering morale. The Air Staff had

Ibid.,  
enc. 33A, 37A;  
Instruction  
FC/S.21205/  
Ops.  
d. 9.11.40

already given a grudging consent to the principle of using operational resources for such a purpose by arranging for Fighter Command to make demonstration flights over certain towns and aircraft factories in the Midlands. (1) Fighter Command

now put up a scheme for the provision of fighters

D.H.O.Br.  
Folder  
"Defence of  
the Aircraft  
Industry", enc.  
d. April 1941  
(D.F.Ops.5277)

manned by test pilots at a limited number of factories to be selected by negotiation with the Ministry of Aircraft Production.

It was emphasized that such measures were regarded as a diversion of force "only acceptable on the score that they might enhance the morale of those requiring such stimulus".

35. These proposals were approved in principle by the Air Staff on February 10th. Some weeks were then spent in obtaining from the Ministry of Aircraft Production a list of selected test pilots and in settling their terms of service. After this various points of detail had to be settled, so that it was not until after the middle of April that the scheme was ready to be put into effect. By this time a decision had been made at the highest level to give priority to the defence of the west coast ports, so that the defence

C.O.S.(41)  
73rd Mtg.;  
FC/S.21594,  
enc.145a

/of

Instruction  
FC/S.21205/  
Ops.(a) d.  
21.4.41

(1) These flights were begun towards the end of 1940 and discontinued in the following April.

of the aircraft industry was no longer the primary task of the air defences.

36. However, the raid on April 14th on A.V.Roe's factory at Manchester was the signal for a violent attack on the Air Ministry by the Minister of Aircraft Production. In a Cabinet memorandum which he was eventually persuaded to withdraw, Lord Beaverbrook complained that a promise made to him in February to provide "goal-keepers" had not been fulfilled. In reply it was pointed out that, as a matter of fact, action had been taken in the Air Ministry and at Fighter Command to prepare for the implementation of the scheme, and on April 22nd the Secretary of State for Air directed that it should be put into effect.

37. The scheme as eventually adopted called for the provision of Spitfires at six factories and Hurricanes at five. A number of test pilots took short O.T.U. courses between July and October. None of the factories concerned has any record of a successful interception by any of the "goal-keeper" aircraft and only one has kept detailed records. These show that on one occasion two test pilots sighted a Ju.88, but lost it in cloud. On October 22nd it was decided that, in view of the heavy demand for aircraft from overseas Commands and Russia, the scheme should be placed in abeyance.

#### The Period of Blockade

##### i. German Disposition and Strategy

38. During the battle of Britain two Luftflotten of the Luftwaffe, namely Luftflotte 2 and Luftwaffe 3, were represented on the western front. The higher formations under their command which were present in France and the Low Countries comprised Flielkorps I and II and Fliiegerdivision 9 under the former, and Fliiegerkorps IV, V and VIII under the latter. (1)

39. In the succeeding winter Fliiegerkorps I was withdrawn to the east, while Fliiegerdivision 9, which specialized in minelaying

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(1) See maps at appendix (III) C.

W.P.(4) 85  
(Proof)

FC/S.20644,  
enc. 128 D,  
etc.  
FC/S.24041,  
passim

Statement by  
Ministry of  
Supply, 11.2.47

FC/S.20644,  
enc. 176a

A.P.3038,  
pp. 8 and 9

Ibid.,  
pp.10 and 11

and anti-shiping operations, was raised to a higher status with the name of Fliegerkorps IX. Reinforcement of the Mediterranean theatre began about the end of 1940 and in the spring flying units were moved to the Balkans from other parts of that theatre and also from the western front in preparation for the coming campaign in Yugoslavia and Greece. Fliegerkorps VIII then moved from France to the Balkans. At the same time the operational area of Luftflotte 2 on the western front was reduced and that allotted to Luftwaffe 3 correspondingly increased. The position at the end of the Balkan campaign in May, 1941 was, then, that Fliegerkorps IV and V remained in France under Luftflotte 3, and Fliegerkorps II and IX in the Low Countries under Luftflotte 2.

40. Soon after this Luftflotte 3 assumed responsibility for the whole of the western front, Luftflotte 2 having been allotted a new operational area in preparation for the campaign in the east. At approximately the same time Fliegerkorps II, IV and V were also transferred from the western to the eastern front. This left under Luftflotte 3 in the west only Fliegerkorps IX and a number of lesser formations which included another anti-shiping organization known as Fliegerführer Atlantik and a Fighter Command. The force remaining in France and the Low Countries at the beginning of the eastern campaign amounted to about 1,200 aircraft - about a third of that employed in the battle of Britain. A small force remained in Norway under Luftflotte 5.

41. In the spring special efforts were made to increase the offensive effort, especially at night, in order to conceal the withdrawals that were taking place. On the opening of the eastern campaign in June this policy lost much of its point, and the Luftwaffe might have been expected to fall back, so far as the western front was concerned, on a

/thoroughgoing

Ibid.,  
pp. 12 and 13

A.P. 1928,  
p.10

thoroughgoing policy of blockade and to eschew all operations which did not contribute directly to that policy.

Such realism would, however, have been foreign to the German High Command. The creation of Fliegerführer Atlantik and

the testimony of prisoners-of-war and others shows that the appropriateness of this policy was appreciated, at any rate

by Luftflotte 3. Senior officers have even declared that in pursuance of it "the small forces available were used in a highly integrated manner to obtain the maximum strategical effect" and that "operations against land targets were relegated far into the background". Yet other statements by the same

officers and the actual course of events make it quite clear that, if both day and night operations are taken into account, the policy of blockade was in fact neither formulated nor applied with the singleness of purpose that was required if satisfactory results were to be obtained with the small force available.

42. According to the senior officers already quoted, the task entrusted to the forces remaining in the west from May onwards was "the continuation of aerial warfare in its present form by attacks on supplies for the British Isles from overseas and against air armament and heavy industries". Obviously, the force available was quite inadequate to carry out this triple task; and it is claimed that Luftflotte 3 interpreted these instructions in their own fashion by concentrating against shipping alone, until forced by pressure from above to divert some of their effort to industrial targets. The records made by Fighter Command confirm that in June and July more than 70 per cent of the German offensive effort by day was directed against shipping, although the proportion declined somewhat in later months. On the other hand, at night a substantial part of the small bomber effort that could be mustered was diverted even as early as July from shipping and ports to targets such as Birmingham and London. Moreover,

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A.D.I.(K)  
Reports Nos.  
12 and 13/1946,  
passim

A.D.I.(K)  
Report No.  
12/1946,  
para. 67<sup>1</sup>

Ibid.,  
paras. 68, 69

Ibid.,  
para. 70

Part II,  
appx. (II) A

A.D.I.(K)  
Report No.13/  
1946, etc.

some of the crews despatched against shipping failed to find any and dropped their bombs at places on or near the east coast. Some of these places were admittedly ports; but as a means of interrupting supplies for the British Isles from overseas the effect of bombing them could hardly be called decisive.

ii. Fighter Sweeps

43. In June, 1941 the fighter sweeps which had been resumed in February and continued during the intervening period became more rare, and early in July these operations ceased altogether. "During 1941", says a senior officer of the Luftwaffe, (1) "German fighter formations were forbidden first to fly over England and later even to pass mid-Channel". That these orders were issued is not surprising, for by this time the small fighter force which remained in the west was fully occupied in dealing with our own daylight offensive. In these circumstances the unwisdom of sending pilots to risk their lives over this side of the Channel when they could meet all the British aircraft they wished on their own side, and stand a better chance of landing safely by parachute if their aircraft were destroyed, must have been obvious to the Germans. At the same time it was undeniable that by taking this step they were surrendering the initiative in the daylight battle to the Royal Air Force. Although a few Me.109s are reported to have flown over Kent and Sussex in September and November, it was not until Christmas Day, 1941 - when two enemy fighters appeared off the Sussex coast and opened fire on buildings at Fairlight, near Hastings as a prelude to the low-level fighter and fighter-bomber campaign of 1942 - that the German fighter force can be said to have turned again to the offensive.

iii. Reconnaissance and Bombing Sorties

a. General Characteristics

44. If the initiative in the daylight battle which turned  
/upon

(1) Adolf Galland.

A.D.I.(K)  
Report No.  
373/1945,  
para. 165

Ibid.,  
paras.162-178

F.C.I.S.  
No.295 etc.

upon the activities of the opposing fighter forces had now passed to the Royal Air Force, this is not to say that all offensive activity by the Luftwaffe in daylight now ceased. On the contrary, the German daylight offensive effort in July amounted, according to British records, to no less than 665 sorties, and the figures for the remaining five months of 1941 were not very much lower. This offensive was not, however, a direct challenge to Fighter Command in the same sense or to the same extent as if it had consisted of fighter sweeps over Kent and Sussex. After the beginning of June, two-thirds of all the German daylight offensive sorties recorded by the defences were devoted to operations against shipping; the remaining third consisted, after the first week in July, entirely of reconnaissance flights and occasional "tip-and-run" sorties against objectives on or near the east coasts of England and Scotland. Indeed, if the intentions of the Germans were known in detail, it would probably be found that many - perhaps all - of these "tip-and-run" attacks were made by crews which had set out to attack ships but failed to find them. As a rule German aircraft making photographic reconnaissance flights over the land (as distinct from shipping reconnaissance sorties) did not drop bombs.

45. From the time when fighter sweeps by the Germans ceased, until the end of 1941, an average day's activity consisted of four or five weather flights over the North Sea and Atlantic and some ten to fifteen reconnaissance and bombing sorties, mostly directed against shipping. During the whole of this period an average of approximately one German aircraft a day flew over the United Kingdom, either to make a reconnaissance or drop bombs somewhere near the coast.

b. Raids of Special Interest

46. Of all the overland sorties made by bomber and bomber-reconnaissance aircraft during the period of blockade, only a few merit individual mention. On June 3rd an aircraft

/dropped

Part II,  
appx.(II) i.

H.Q.F.C.  
Forms "Y"  
etc.

dropped a stick of bombs through thick cloud near J.S. White's Works at Cowes, Isle of Wight. This aircraft used the "Bomber Benito" method of blind navigation, which was being developed by the highly specialised unit K.G.26 and was designed to give precision bombing of unseen targets. On this occasion the M.P.I. of the bombs was about three furlongs from the target, which had been narrowly missed in the course of similar attempts on two nights in May. So far as is known this was the first use of the "Benito" method in daylight, and the special counter-measures controlled by No.80 Wing did not go into action. There is no record of any further use of this method by day in 1941, although it was used again by night.

Home Security  
Weekly  
Appreciations -  
(various dates)

47. With one exception the other targets attacked by day during the second half of 1941 were all on or near the east coast of England or Scotland. In a few cases factories were hit, but none of these attacks resembled the carefully-planned "pirate" raids of earlier months.

H.Q.F.C.,  
Form "Y";  
F.C.I.S.  
No.295

48. On November 29th bombs were dropped near Downpatrick, Northern Ireland by an aircraft which had previously flown over Lough Foyle and Belfast. Shortly before dropping its bombs this aircraft was intercepted by two Spitfires IIA of No.504 Squadron, but escaped into cloud. It seems probable that the purpose of this aircraft was reconnaissance and that the bombs were jettisoned, not dropped deliberately.

c. Special Measures to deal with Single Raiders

49. If German aircraft reconnoitring overland seldom dropped bombs, it did not follow that they could be permitted to roam over the country at will. Already, in March, the Air Officer Commanding-in-Chief, Fighter Command had urged his Group Commanders to pay special attention to single raiders. (1) Even earlier than this they had been invited

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(1) See para. 13, above.

FC/S.22254,  
enc. 5.

FC/S.22254,  
enc. 10.

Ibid.,  
enc. 11A.

Ibid.,  
enc. 17B.

FC/S.22254,  
enc.17A

Ibid.,  
enc. 31A

No.10 Group Op.  
Instructions  
Nos.55 and 65  
d. 9.8.41 and  
23.9.41

to make use of their A.I. fighters by day when the weather was bad, and early in 1941 it had been arranged, in response to a further exhortation, that in such circumstances a Beaufighter should be held at "Readiness" in the Middle Wallop Sector to work under G.C.I. Control. (1) Nevertheless, on August 13th an enemy aircraft made an extended overland reconnaissance, remaining over the mainland for more than an hour and passing over the industrial Midlands and Central London at moderate altitudes, without being intercepted. (2) Seven fighters were put up in connection with this raid, but although the weather was cloudy they did not include a single A.I. aircraft working under G.C.I. control.

50. After this experience Group Commanders were again urged not to neglect this method of interception. A memorandum to this effect was circulated by Headquarters, Fighter Command on August 15th and on October 2nd this was followed by a further memorandum in which Group Commanders were instructed to take every opportunity during the autumn and winter of giving A.I. squadrons and G.C.I. controllers training in daylight interception.

51. This problem received special attention in No.10 Group, where the arrangement by which a Beaufighter was held at "Readiness" in the Middle Wallop Sector was succeeded by orders to all operational G.C.I. Stations to maintain a 24-hour watch except during a daily maintenance period for each station. It was also arranged that in bad weather Beaufighters should be kept at "Readiness" in all Sectors where they were available. The G.C.I. Stations began their 24-hour watch at 0001 hours on August 13th. Furthermore, Sector Controllers were authorized after September 23rd to despatch up to two pairs of aircraft to investigate or intercept raids without previous reference to the Group Controller, and arrangements were made by which fighters, /whether

(1) See para. 21 above.

(2) It also passed over Headquarters, Fighter Command at Stanmore.

whether equipped with A.I. or not, could be handed over to the control of G.C.I. Stations.

No.11 Group  
Controllers  
Instruction  
No.68/41  
d. 23.8.41

52. In No.11 Group also, arrangements were made by which fighters with or without A.I. could be controlled in daylight by G.C.I. Stations, although in this case the stations were not required to keep watch in good weather.

S.D.564,  
paras.44-52

53. Since one of the chief obstacles to the interception of single aircraft was the inevitable inaccuracy of the information furnished by observers on the ground, especially in bad weather, the decision to employ G.C.I. control by day as well as at night was an important step towards the solution of this problem. Nevertheless it cannot be claimed that these arrangements bore much fruit in 1941. For the rest of the year the number of enemy aircraft which flew over southern England was very small and the interception of the single raider continued to be a rare event.

d. Interception of High-Altitude Raids

No.10 Group Op.  
Instruction  
No.64 d. 16.9.41

54. Towards the end of the summer it was feared that in the near future the introduction into the Luftwaffe of aircraft capable of flying at great heights might raise special problems. (1) Accordingly it was arranged in September that aircraft of No.10 Group should carry out practice interceptions of Fortresses of No.90 Group, Bomber Command, at altitudes of 30,000 feet and upwards. These practice interceptions were made from the Middle Wallop Sector with the co-operation of Sopley and Cricklade G.C.I. Stations. Later in the year a more ambitious scheme was devised, by which the greater part of England and Wales were divided into four areas (corresponding roughly with the areas covered by Nos. 9, 10, 11 and 12 Groups) each containing an "Area Control" connected with a "Central Control" which would co-ordinate their activities. The story of the development of this system belongs, however, to 1942 rather than 1941.

Instruction  
10G/S.8233/17/  
Ops. d.19/11/41

/iv.

C.O.S.(41)  
163.

(1) This possibility had, indeed, been foreseen as early as March, when consideration was given to the production of A.A. guns capable of engaging aircraft flying at 40,000 feet and more.

iv. Balloon Defences: Operational Policy

55. The reduction in the scale of enemy activity against land targets which was so evident during the period of blockade, made it possible in the autumn to contemplate a change of policy with respect to the flying of balloon barrages. It was felt that the time was ripe for such a change since an increased volume of flying by friendly aircraft had already led to a rise in the accident rate and it was obvious that this tendency was likely to increase. Technical improvements had now made it possible to raise close-hauled balloons to their operational height more quickly than in the past. Accordingly, it was decided in November to experiment with a system by which a large number of provincial barrages would be grounded both by day and at night except when enemy aircraft were known to be about. It was not until early in 1942, however, that this scheme received final approval.

Summary

56. To sum up, the period from the beginning of November 1940 to the end of 1941 was one in which the initiative in almost every branch of day operations passed from the Luftwaffe to the Royal Air Force. At the beginning of this period, scores or even hundreds of German aircraft were flying over British soil every day and shipping was being vigorously attacked by both short-range and long-range aircraft. At the end of it, sorties over the United Kingdom were very few - in the whole of December, 1941 only thirteen were recorded - while attacks on coastwise shipping in daylight were few and made only by long-range aircraft operating singly or in very small formations. So striking was the reduction in the scale of overland attack that it was possible to contemplate an important change of policy in regard to the flying of balloons. On the other hand, the problem of intercepting the single raider in bad weather was not yet solved, and it was judged prudent to prepare for new forms of attack which might come in the future.

PART FOUR

THE FIGHTER ASPECT OF THE DAYLIGHT OFFENSIVE

FROM THE END OF 1940 TO THE EVE

OF THE GERMAN ATTACK ON RUSSIA.

PART FOUR

THE FIGHTER ASPECT OF THE DAYLIGHT OFFENSIVE FROM

THE END OF 1940 TO THE EVE OF THE

GERMAN ATTACK ON RUSSIA

Retrospect: the Fighter Offensive, 9th June to  
20th October, 1940

1. The closing days of 1940 and the first few weeks of 1941 saw the launching of a fighter offensive which was to develop during the next three years into an important strategic weapon. However, the use of the home defence force, or parts of it, for tactically offensive purposes was not new. Arrangements had long existed by which squadrons of Fighter Command could be called upon to provide escort for bomber or reconnaissance aircraft over territory occupied by the enemy and waters adjacent thereto. Moreover, almost immediately after the Dunkirk evacuation in the summer of 1940 it had been decided that, since the full weight of the Luftwaffe was likely to be turned against the United Kingdom in the immediate future, everything possible must be done to reduce the numerical superiority which that body continued to enjoy. Accordingly, Commanders-in-Chief were instructed on June 9th to "take every opportunity of destroying enemy aircraft wherever met". It was intended that aircraft of Fighter Command should give an offensive flavour to their protective patrols over the battle area by attacking aerodromes occupied by the Germans, with the object of destroying aircraft on the ground.

A.M. Signal  
X.264 d.  
9.6.40  
(D.H.O.Br.  
Folder)

2. In practice it was impossible for the home-based fighter force to go very far in giving effect to this policy. In the first place, the desirability of resting and re-equipping squadrons after the effort of Dunkirk imposed a limit on the extent to which Fighter Command could share

in operations on the far side of the Channel. Secondly, the military and political situation made it necessary to forbid our home-based aircraft to land in France, except in an emergency, after the first eight days of June. The factors of range and fuel consumption seldom allowed fighters operating from England to fly an adequate protective patrol and afterwards attack an aerodrome before returning to their home bases. Thus for the remaining ten days of the French campaign the contribution of Fighter Command to events across the Channel was virtually limited to protective support of British and French troops in Normandy,<sup>(1)</sup> and the provision of escort for bombers.

3. After the close of the campaign in France, fighters of the home defence force continued to provide escort for various bombing and reconnaissance missions across the Channel. On June 21st, for example, Hurricanes of No. 111 Squadron escorted a formation of Skuas which dive-bombed a gun-emplacement near Calais. In addition, aircraft of Fighter Command flew a number of reconnaissance sorties on their own account. But as the intensity of German air operations against this country increased, the occasions on which Fighter Command could reasonably be called upon for such support grew rarer. Once the battle of Britain had begun, it proved no easy matter to find aircraft for this task on the rare occasions when such a demand was felt to be justified.<sup>(2)</sup> Hence, from the

/middle

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- (1) This support was substantial. On June 11th 147 sorties were flown from England in support of the attempted evacuation of the 51st Division and French IXth Corps through St. Valéry-en-Caux. This figure was exceeded on the following day, when 180 sorties were flown over that town, but unfortunately many of these were wasted, as fighting ceased before mid-day.
- (2) On September 24th, 1940, for example, fighter escorts were requested for 12 Blenheims and an Anson respectively which were to attack small craft in the Channel. The escort allotted to the Anson had to be diverted at the last moment to meet an enemy air attack, and for a similar reason that allotted to the Blenheims arrived a few minutes late and was not seen by their crews, although present at the scene of the operation.

R.A.F.  
Narrative:  
"The Campaign  
in France  
and the Low  
Countries",  
pp.389-394

No.11 Group  
Int.Bulletin

R.A.F.  
Narrative:  
"The Campaign  
in France  
and the Low  
Countries",  
pp.406-417

middle of July until the autumn, Fighter Command operated almost exclusively on its own side of the water.

Proposals for a renewal of the Fighter Offensive,  
21st October to 20th December, 1940

Minutes of  
Conference  
(Appendix to  
No.11 Group  
Form 540)

FC/S.21552,  
encl.1A

4. A renewed use of home defence squadrons in a tactically offensive role was suggested towards the end of October, when the Air Officer Commanding No.11 Group announced at a conference of his subordinate commanders and staff officers that "it was hoped in the early Spring to take a more aggressive role than the defensive attitude forced upon us recently".<sup>(1)</sup> On October 21st an order was issued by No.11 Group laying down the conditions in which offensive sweeps were to be carried out if ordered. The sweeps were to be made on each occasion by a wing of three squadrons flying at 25,000 feet, and their immediate object would be to surprise the relatively weak patrols which the enemy was in the habit of maintaining over the Straits of Dover. To ensure that they did not coincide with a mass raid by the enemy, they were to be limited to the last few hours of daylight, when he could be trusted not to initiate operations which would involve landing after dark.

5. At this time the battle of Britain was drawing to a close. Mass attacks on the United Kingdom by the German long-range-bomber force had failed. The enemy was, however, unwilling to relinquish the offensive and was using his fighter force - partially re-armed as a fighter-bomber force and assisted by ground-attack aircraft - to make high-level nuisance raids over Southern England. This development was difficult to counter. On the assumption that it must be countered - not because this almost aimless bombing was particularly harmful, but in order that the moral advantage gained in the recent

/fighting

A.D.I. (K)  
Report No.  
373/1945  
and A.I.12/  
USAFE/TE. 53

Report 11G/  
493 d.  
7.11.40

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(1) No record can be found of the discussions at a higher level which must have preceded this announcement.

fighting should not be surrendered - new tactics were required. These offensive sweeps seem to have been devised as a contribution to this problem rather than as part of any major strategic plan. It would appear that they were regarded as falling within the scope of the Group's normal activities and as covered by existing directives and standing instructions. There is no evidence that at this stage anything more ambitious than a "defensive offensive", designed to assist in the defence of the United Kingdom and coastwise shipping, was in view.

6. The order relating to these sweeps remained in force from October 21st to December 8th, when it was superseded by a fresh order governing the execution of what were now to be called "sector offensive sweeps". These were to be made, as previously contemplated, by three-squadron formations, but the squadrons were to be stepped up from 20,000 or 25,000 feet to 30,000 or 35,000 feet. The sweeps were no longer to be limited to the last hour or two of daylight, but were normally to be made in the afternoon.

FC/S. 21552,  
encl. 6A

7. In the meantime the principle that in the New Year the fighter force should, if possible, "lean forward into France" had been formally adopted by the Air Staff. At his first meeting with his Group Commanders on November 29th the newly-appointed Air Officer Commanding-in-Chief, Fighter Command<sup>(1)</sup> developed this idea, explaining that it was desirable to "get away from the purely defensive outlook". He suggested that formations of three or even six squadrons should sweep over England, over the Channel, or as far afield as Calais, and instructed the Air Officer Commanding No. 11 Group to look into the possibility of combining such sweeps with operations by the Bomber Groups.

S. 2587/XV,  
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FC/S. 21552,  
encl. 11A

/8.

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(1) Air Marshal W. S. Douglas had succeeded Air Chief Marshal Dowding on November 25th.

F.O./S. 21552,  
encl. 15A and  
17A;  
FC/S. 22332,  
encl. 1A

Appendices  
to  
No. 11 Group  
Form 540

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11G/493  
30.11.40

S. 3488,  
encl. 7A

8. This discussion was followed on December 8th by the issue of the order relating to "sector offensive sweeps", to which reference has been made above. A further sequel came on December 21st, when the Air Officer Commanding No. 11 Group issued the first of a new series of instructions and orders relating to offensive operations by day.<sup>(1)</sup>
9. The issue of this instruction of December 21st marked the inauguration of the daylight offensive proper.<sup>(2)</sup> Meanwhile, during the currency of the orders of October 21st and December 8th, some patrols were flown over the Channel; but as it was No. 11 Group's normal practice at this stage to meet the enemy as far forward as possible, it is doubtful whether any of these patrols can be described as "offensive" in the sense which that word now came to have.<sup>(3)</sup>
- The Formulation of a Policy for the Fighter Offensive, late December, 1940
10. Up to this time, no formal directive authorising the commencement of an offensive had been given by the Air Ministry to Fighter Command, or by Fighter Command to No. 11 Group. Nevertheless, in accordance with the principle of "leaning forward", and the verbal instructions given by Air Marshal Douglas on November 29th, the programme now announced by No. 11 Group went far beyond the modest proposals for a "defensive offensive" contained in previous orders.

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- (1) Meanwhile No. 11 Group had also undergone a change of Command, Air Vice-Marshal T. L. Leigh-Mallory having succeeded Air Vice-Marshal K. R. Park on December 18th.
- (2) This instruction and a further instruction issued on December 24th are reproduced at appendices (IV)A and (IV)B.
- (3) None was so described in the operational reports (Forms "Y") rendered by Fighter Command to the Air Ministry. On the other hand Air Vice-Marshal Park is reported to have said at the conference on November 29th that his squadrons had occasionally been operating offensively.

The intention expressed in the original order of October 21st had been "to surprise the enemy by making a sweep in strength through the Dover Straits". That now substituted for it was:

FC/S. 22332,  
encl. 1A

"to harass the Germans by daily 'tip-and-run' operations, to make them feel that flying over Northern France or Belgium is unsafe, and so force them to some system of Readiness in order to protect themselves".

11. To this end, it was proposed to begin operations falling into the following broad classes:-

(a) Patrols by single aircraft or formations up to a flight in strength, which would dart out of the clouds to attack enemy aircraft and then return to the clouds.

(b) Offensive sweeps by "large fighter forces", sometimes accompanied by bombers.

12. Originally the code-name "Mosquito" was applied to operations of the first kind. As the existence of an aircraft with this name threatened confusion, the less appropriate name "Rhubarb" was substituted for it on January 27th, 1941. (1)

F.C./S. 22332,  
encl. 15A

13. Similarly, the code-name "Circus" was to have been applied to all operations of the second kind. (2) In practice it soon became necessary to distinguish various different types of operations within this class, and the name "Circus" was reserved for operations in which bombers took part and which fulfilled certain conditions. (3)

/14.

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(1) This is the name that will be used throughout this account.

(2) The term "Circus" had previously been applied by the Air Officer now Commanding No. 11 Group (Air Vice-Marshal Leigh-Mallory) to the large wings which he advocated for defensive operations.

(3) See paragraphs 38 and 39 below.

14. It was clear that the assembly of "large fighter forces" would require reasonably good weather. On the other hand operation "Rhubarb" could only be performed when clouds were present. Hence it could be expected that the two classes of operations would complement each other and thus go far to make a sustained offensive possible.

Operation "Rhubarb"

i. Definition

15. Operation "Rhubarb" was, by definition, to consist of a series of patrols over territory occupied by the enemy, to be made by single fighters or formations up to a flight in strength, operating with cloud cover. The patrols were not to be made, however, when the clouds came down below 2,000 feet. (1) The primary purpose of the operation was to attack enemy aircraft in flight; but if no enemy aircraft were seen in flight, pilots might "in favourable circumstances" attack suitable ground objectives. These must be German military objectives.

ii. First patrol, 20th December, 1940

16. The first "Rhubarb" patrol was flown on December 20th, 1940 - the day before the issue of the instruction governing the execution of these patrols. Just before 1600 hours on that day, two Spitfires of No. 66 Squadron, piloted by F/Lt. G.P. Christie and P/O C.A.W. Bodie, left Biggin Hill and flew across the Channel just below a bank of cloud which came down to a few hundred feet. They reached the French coast at Dieppe and turned inland near Criel. Thence they flew north at "tree-top height" and came to an aerodrome which seems to have been either Berck or Le Touquet. They flew low over this aerodrome, were fired at from the ground, and opened fire in return. According to the report rendered immediately afterwards, P/O Bodie subsequently fired at buildings on the sea-front. Both

/pilots

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(1) Later amended to 1,500 feet.

FC/S. 22332,  
encl. 1A

FC/S. 22332,  
encl. 6A;  
H. Q. F. C. Form "Y"  
No. 11 Group  
Int. Bulletin  
No. 134;  
No. 66 Squadron  
Form 540

pilots then returned to England and landed separately at aerodromes in Kent and Sussex at 1715 hours.

iii. Points of Divergence between execution of first "Rhubarb" Patrol and Instructions for Operation "Rhubarb"

17. If this patrol was accurately reported, its execution contravened in two respects the conditions laid down on the following day. In the first place, the clouds over the Channel had come down to a few hundred feet. Secondly, buildings on the sea-front of a French town were not, prima facie, a German military objective. The second point was made the subject of comment in various quarters. Hence attention was attracted to the whole question of what were permissible military objectives for aircraft engaged in operation "Rhubarb".<sup>(1)</sup> This revealed a somewhat complex situation which requires explanation.

iv. Permissible Ground Objectives for Operation "Rhubarb"

18. In the summer of 1939, the principles which should govern the conduct of armies in the field could be considered well established by practice. On the other hand, those which should govern naval and air bombardment were by no means clear or universally accepted. This problem was, however, under consideration by H.M. Government, and shortly before the outbreak of war it was possible to issue a document called "Instructions Governing Naval and Air Bombardment", which enunciated certain principles to be followed in the opening stages of hostilities, although it was foreseen that these might have to be modified as the war went on. Among the most important of them were that only "purely military objectives in the narrowest sense of the word" might be bombarded, that it must be possible

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(1) Similar considerations arose in connection with operation "Intruder", which was also starting at this time.

FC/S. 22332,  
encl. 7A, 8A;  
FC/S. 17360,  
encl. 25A

FC/17360,  
encl. 1c;  
S. 46105,  
missin

to distinguish and define the objective, and that the manner of bombardment must be such that there was a reasonable expectation that damage would not extend to civilian populations in the neighbourhood.

19. These instructions were sent to Fighter Command (among other recipients) on August 22nd, 1939. At the same time a paper entitled "Air Ministry Instructions and Notes on the Rules to be observed by the Royal Air Force in War" was widely circulated for the information of commanders of formations and units and of all captains and crews of aircraft.

FC/S17360,  
encl. 1B

S.46105,  
encl. 33A; and  
FC/S.17360,  
encl. 2A

20. Shortly after the outbreak of war it was considered desirable to inform those concerned that a clause in the instructions which authorized attacks on "air units, military aerodromes, depots, storage units, bomb stores and other establishments manned by Air personnel" must be freely interpreted in regard to attacks on objectives "in the vicinity of the land battle".

21. The opening up of the war in the west in May and June of 1940, and the measures taken by the Germans, led H.M. Government to modify their policy. On June 4th, 1940 the original instructions of August, 1939 were superseded by fresh instructions, which reached Fighter Command on the following day. In these new instructions the words "military objectives" were substituted for "purely military objectives in the narrowest sense of the word" and the categories of objectives on which attacks were specifically authorized were enlarged. Merchant vessels, whether defensively armed or not, were specifically excluded from attack, except in "special zones" which were to be defined from time to time.

S.46105  
encl. 85B

FC/S.17360,  
encl. 20A

22. In July it was decided that any military objectives in France and other countries occupied by

FC/17360,  
encl. 24A

/the

the Germans might be bombarded, subject to the proviso that military establishments selected for attack must be known to be occupied by Germans or Italians, and that moving trains must not be attacked in any case. This decision was communicated to Bomber and Coastal Commands in July and to Fighter Command on August 17th, 1940.

23. When the commencement of operations "Rhubarb" and "Intruder", and in particular the patrol of December 20th, focussed attention on this subject, it was discovered at Headquarters, Fighter Command that, while the original instructions of August, 1939 and the further communication of October, 1939 had been duly circulated to Groups, the new instructions of June 1940 and the amplifications and additions received since that date had not been passed below the Command Headquarters. This was an understandable omission, since the Command had been little concerned with offensive action up to this time.

FC/S.17360,  
encl.30A, etc.

24. The more up-to-date instructions were now circulated to the Fighter Groups. By the end of the first week in January, therefore, the position was that the objectives in the countries occupied by the Germans which could legitimately be attacked in the course of "Rhubarb" patrols, and which Groups knew could be attacked were those permitted by the following broad principles:

FC/S.17360,  
encl.26A  
and 27A

- (a) Enemy military forces, including naval auxiliaries, troop transports and military supply ships could be attacked in any circumstances which did not infringe the Red Cross conventions or involve disproportionate risk to civilians.
- (b) Military works, fortifications, aerodromes (whether designated military or civil),

/and

and stores and dumps of military supplies could also be attacked on these terms.

- (c) Military establishments and depots, including barracks, camps, billets and naval dockyards, could be "specifically selected for attack" only if they were known to be in use or occupation by Germans or Italians.
- (d) Shipyards, factories and other establishments engaged in the manufacture, assembly or repair of military material, equipment or supplies, as well as power stations ancillary thereto, and also fuel and oil producing plants, refineries and storage installations, could be attacked, but not if attacking them involved the intentional bombardment of civil populations or undue risk to civilians. Moreover, the spirit of the instructions required that they should be known to be working for the Germans or Italians. (1)
- (e) Lines of communication and transportation and means of inter-communication serving military purposes could be attacked if attacking them did not involve the intentional bombardment of civilian populations or undue risk to civilians;  
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(1) Last sentence Narrator's comment.

but attacks on moving trains and on merchant ships were specifically forbidden.<sup>(1)</sup>

25. It did not follow, of course, that all the objectives permissible under these rules were equally suitable for attack by fighters on "Rhubarb" patrols. Nevertheless no order of preference was laid down by the Air Staff or Command Headquarters at this stage. It was left to Group and lower formations to plan these patrols according to the local circumstances and within the general framework of the bombardment instructions. The view of the Air Officer Commanding-in-Chief, Fighter Command was that operation "Rhubarb" must be regarded as primarily directed against enemy aircraft in flight, and that attacks on surface objectives were a secondary consideration.

F.C./S.22332,  
minute 28

v. Second and Subsequent Patrols up to 28th February, 1941.

26. The next "Rhubarb" patrol was flown on December 22nd. The pilots of the two Hurricanes concerned found, before reaching the coast of France, that the expected cloud-cover was not present, and returned in accordance with their instructions. On December 27th there was another "Rhubarb" patrol by two Spitfires: the pilots saw very little activity, but fired at some lorries and a motor-car. In the course of another patrol by Hurricanes on the 29th an attack was made on what seemed to be petrol tanks on the aerodrome at St. Inglevert.

H.Q.F.C.,  
Forms "Y",  
No. 11 Group  
Int. Bulletins,  
etc.

/27.

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(1) Subject to the freedom of neutral vessels to proceed on notified courses, any ship at anchor in the territorial waters of countries occupied by the enemy, alongside in a port in enemy possession, or under way, alongside or at anchor in certain defined areas of the North Sea, the Skagerrak and the Bay of Biscay (excluding Spanish coasters on their lawful occasions) might, however, be attacked. With the permission of the naval authorities concerned, aircraft might also attack vessels in the English Channel.

F.C./S.19021,  
passim.

Ibid.

27. "Rhubarb" patrols were continued on suitable days in January. On January 12th no less than twelve sorties were flown, of which two were abortive. On this day enemy fighters were encountered for the first time, and two Hurricanes and their pilots failed to return. One Me.109 was inconclusively attacked. In February the operation continued on much the same lines. The month produced one inconclusive attack on an enemy aircraft seen taking off from an aerodrome; and two pilots failed to return from a patrol which was to have taken them rather further afield than was usual at that time.

vi. Proposals to extend the scope of Operation "Rhubarb": early 1941

28. So far operation "Rhubarb" had not resulted in claims to the destruction of any enemy aircraft. The number of useful and legitimate surface objectives vulnerable to attack by the normal armament of fighter aircraft was limited. No.11 Group therefore suggested early in March, 1941, that the scope of the operation should be widened by allowing Hurricanes and Spitfires to carry small incendiary bombs in a makeshift container fitted to the flare tube. These would be used against such objectives as hutted camps. This suggestion was rejected by the Air Officer Commanding-in-Chief, partly on the ground that attacking surface objectives was not the primary object of the operation, and partly because it was considered that the usefulness of such a bomb-load would be small in proportion to the risks involved. The modification of the Hurricane to carry bombs of substantial calibre was under consideration at this time; but this venture was not to bear fruit until the autumn. (1)

F.C./S. 22332,  
encl. 22A

F.C./S. 22332,  
minute 28 and  
encl. 30A

F.C./S. 24738,  
passim

/29.

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(1) See Part IV, paragraphs 64 - 78.

29. Another suggestion, first made by No.11 Group in January, was that the "instructions governing naval and air bombardment" should be relaxed so as to allow pilots to attack moving goods trains. This proposal was considered at various times and levels during the first ten months of 1941, but it was not until October 20th that H.M. Government felt justified in modifying their policy in this respect. Thereafter, aircraft of fighter type operating in daylight under Fighter Command control were permitted to attack goods trains on the move.

vii. Patrols from 1st March to 13th June, 1941

F.C./S.17360,  
encl. 28A-38A  
and 47A

C.O.S. (41)  
137th Mtg.;  
C.M.S. 868,  
encl. d.  
21.10.41

C.S. 11377,  
encl. 4A

30. Only two "Rhubarb" patrols were flown during the first twenty days of March, one of them by No.12 Group; but on March 21st No.11 Group, which had suspended operations of this class since March 2nd, resumed them, and henceforward until the end of the period at present under consideration a more intensive effort was maintained than in January or February.

H. Q. F. C. Forms  
"Y", Group  
Monthly  
Reports, etc.

31. The first claim to the destruction of an enemy aircraft in flight by a pilot engaged on a "Rhubarb" patrol was scored on April 9th, when F/Lt. J.J. O'Meara, flying a Spitfire of No.64 Squadron, was credited with destroying an He.59 off Dunkirk. Later in the day a pilot of No.54 Squadron was credited with the destruction of an Me.109 in roughly the same area. The detection of an enemy convoy which was passing along the French coast under Fighter escort helped to make this an unusually busy and successful day for units assigned to operation "Rhubarb". Thirty aircraft sorties were flown in the course of the ten patrols ordered; one of these patrols was not completed, but in the course of six of the remaining nine enemy aircraft were seen in flight, to a total of eighteen aircraft. In the combats which resulted, two enemy aircraft were claimed

Ibid., also  
No. 64  
Squadron  
Form 540

as probably destroyed, in addition to the two already mentioned which were claimed as destroyed. One of our pilots failed to return. (1)

H.Q.F.C.,  
Forms "Y",  
etc.

32. However, these results were exceptional. (2)
- During the rest of April only one more enemy aircraft was claimed as destroyed. Three were claimed in May and one during the first thirteen days of June. Out of 102 patrols ordered in April, May and the first thirteen days of June, 26 could not be completed, and on only 20 occasions out of the remaining 76 were any enemy aircraft seen in flight. Thus, more often than not pilots flying "Rhubarb" patrols were forced to fire at surface objectives as the only alternative to not firing at anything at all.

viii. Summary of Patrols and Results, 20th December, 1940 to 13th June, 1941

- Ibid.
33. Altogether, from the commencement of operation "Rhubarb" on December 20th, 1940 until the end of the period covered by this chapter, 149 "Rhubarb" patrols were ordered. Forty-five of these were not completed, in nearly every case because of unsuitable weather. The 104 patrols completed - which involved 233 aircraft sorties - resulted in enemy aircraft being seen in flight on 26 occasions. On eighteen occasions engagements followed, this including one case in which two distinct engagements occurred in the

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- (1) All figures for claims and losses quoted in this and subsequent chapters refer, unless otherwise stated, to the "assessed" returns as finally amended by Headquarters, Fighter Command. These sometimes differ substantially from the returns made immediately after the conclusion of an operation.
- (2) A summary of the "Rhubarb" patrols flown from the start of the operation until June 13th, 1941, and their results, is given at appendix (IV) C.

course of a single patrol. These engagements resulted in claims to the destruction of seven enemy aircraft, against which we lost eight pilots. The remaining 87 patrols brought no engagements. Finally, the 104 patrols completed resulted in 116 recorded attacks on surface objectives, <sup>(1)</sup>including naval craft and coasters (25 attacks); road vehicles (eighteen attacks); enemy aircraft on the ground, and gun and searchlight posts (each class seventeen attacks); aerodrome buildings and installations (sixteen attacks); and troops, camps and billets (sixteen attacks). The balance of seven attacks was spread over a variety of targets.

ix. Comment on Results, 20th December, 1940 to 13th June, 1941

34. The figures quoted above and those given in appendix (IV)C show quite clearly that so far operation "Rhubarb" had resulted in the engagement of enemy aircraft on comparatively few occasions. Seventy-five per cent of the patrols completed during this period - after subtracting those rendered abortive by such extraneous circumstances as unsuitable weather - brought no glimpse of an enemy aircraft. Of the total number of patrols ordered, only eleven per cent resulted in engagements, and not all these engagements turned to our advantage. To produce claims to the destruction of seven enemy aircraft, 336 sorties were flown and eight of our pilots lost. As for the attacks on surface objectives - some of them of doubtful legitimacy - their effect on the German military machine is difficult to assess, but can hardly have been great. Probably the attacks on grounded aircraft, airfield installations and gun-posts produced a good effect. Whether the positive value of the rest was great enough to offset

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(1) Attacks on the same objective by two or more aircraft flying together have been counted as one attack.

the unfavourable impression made by some of them on French civilians was at the time, and must remain, a matter for conjecture.

35. However, the success of the operation cannot be judged only by immediate results. Its ultimate purpose was to assist in harassing the Germans and so forcing them to adopt a system of "fighter readiness" at a time when they might have expected to be left alone to rest and train. That the daylight offensive did induce the Germans to adopt such measures in the summer, if not in the spring, of 1941 is clear enough from the evidence of their own statements. What is not so clear is how far operation "Rhubarb" can claim credit for this achievement and how far it must go to the more ambitious operations in which bombers were employed. On the whole the evidence suggests that operation "Circus" must take most of the credit. Nevertheless it would be rash to deprive operation "Rhubarb" of any share. Clearly there were occasions when "Rhubarb" patrols did claim the attention of the enemy's fighter force. The threat of low-level attack cannot have been without its effect on the morale of Luftwaffe personnel on the ground, and must have modified the enemy's attitude to such questions as the manning of ground defences. Therefore operation "Rhubarb" did play its part, however humble, in harassing the enemy, and played it on days when the weather precluded the more effective operations in which bombers and substantial numbers of fighters were employed. If we accept the dictum of the Chief of the Air Staff that losses equal to, or even higher than, the enemy's were not too high a price to pay for the privilege of exercising the initiative, we may not unreasonably conclude that at the cost of eight of our pilots this achievement was not too dearly bought.

A.D.I. (K)  
Report No.  
373/1945,  
paras. 163  
et seq.

F.C./S. 21552,  
encl. 82A

36. Moreover, there is another aspect of the operation. There can be no doubt that the experience gained by pilots, Intelligence Officers, and the Staffs of lower formations generally in the planning and execution of these patrols was of great immediate and still greater potential value. Although this was not always apparent at the time, it is easy to see now how valuable a training-ground this operation was for many who would one day share in supporting the operations of an armed force on the Continent.

37. On the other side of the account, it is possible to argue that by the end of the first month or two it should have been evident that "Rhubarb" patrols were not likely to bring many opportunities of destroying enemy aircraft in flight, and that to go on stressing this aspect of them was unrealistic. According to this view, by the early Spring the time had come to recognize the principle that, more often than not, pilots flying "Rhubarb" patrols must either attack a surface objective or return home without firing their guns. It is possible that if this principle had been recognized then at the higher levels, a definite "target policy" designed to ensure that these attacks should contribute to some specific military purpose would have been framed sooner than it was. In practice, many months were to go by before such a target policy emerged.

#### Fighter Sweeps and Operations with Bombers

##### i. Definitions

38. Originally it was intended that the term "Circus" should be used for all offensive patrols involving substantial numbers of fighters, whether accompanied by bombers or not. In practice it soon became necessary to distinguish between the following three classes of patrols

falling within this definition, viz.

- (a) Fighter sweeps;
- (b) Operations with bombers, in which the bombers attacked targets within comfortable fighter range and a fighter-battle was intended;
- (c) Operations with bombers, in which the bombers attacked shipping, and the role of the fighter force was simply to protect the bombers.

39. Once the operations were under way, the term "Circus" came to be reserved for missions of the second type.

ii. First Fighter Sweep, 9th January, 1941

40. The first fighter sweep under the terms of the arrangements made towards the end of December, 1940, took place on January 9th, 1941. Soon after 1330 hours on that day Nos. 1 and 615 Squadrons crossed the English coast and flew at 21,000 feet across the Channel to a point just off Cap Gris Nez. Here they turned north-east, flew to a point off Calais, and then set course for home. Meanwhile Nos. 65, 610 and 145 Squadrons, stepped up at 1,000 foot intervals from 22,000 to 24,000 feet, had flown to Boulogne, where they crossed the French coast and proceeded inland as far as the neighbourhood of St. Omer. Here they turned to the north-west and hence proceeded homewards by way of Calais. The weather was fine and visibility was good.

41. The evidence of the radar chain suggests that some enemy aircraft were in the air over the Pas de Calais while these sweeps were in progress. However, none of our pilots saw any enemy fighters or reported any fire from the ground. The landscape of the Pas de Calais was covered with snow and the only sign of any activity by the Germans was some smoke seen over an aerodrome near St. Omer.

/iii.

H. Q. F. C. and  
No. 11 Group  
Forms 540  
(Appendices)

Controller's  
Report  
(H. Q. F. C.  
Form 540,  
Appendices)

iii. "Circus I", 10th January, 1941

42. On the following day the first true "Circus" patrol with bombers was carried out. The intention, as expressed in the order for this operation, (1) was to bomb enemy dispersal pens serving landing grounds on the edge of the Forêt de Guines, (2) south of Calais, and stores of material in the forest; and to destroy enemy aircraft in the air. Should few or no enemy aircraft be met in the air, an aerodrome and a landing-ground at St. Inglevert were to be attacked by fighters.

43. Again the weather was good giving excellent visibility apart from a slight ground-haze over France, where there was still snow on the ground. At 1215 hours six Blenheim bombers of No. 114 Squadron, No. 2 Group, Bomber Command, made rendezvous over Southend pier with six fighter squadrons - Nos. 56, 242, 249, 41, 64 and 611. From Southend pier the Blenheims flew in a tight formation at 12,000 feet to a point on the French coast just east of Calais. The Hurricanes of No. 56 Squadron flew in various situations around and amidst the formation of Blenheims; those of Nos. 242 and 249 Squadrons about 1,000 feet below and to starboard, with the second of these squadrons a little above and to starboard of the first. The Officer Commanding R.A.F. Station, North Weald (Wing Commander F.V. Beamish) flew with No. 249 Squadron. The Spitfires of Nos. 41, 64 and 611 Squadrons flew in stepped-up formation above and to port of the Blenheims, with No. 64 Squadron leading and No. 41 Squadron in the rear at 16,000 feet.

44. On crossing the French coast the Blenheims changed to a more open formation, which they retained while over /France.

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(1) Reproduced at appendix (IV) D.

(2) The spelling "Guisne" in the operation order is incorrect.

No. 11 Group  
Form 540  
(Appendices);  
Forms 540 of  
fighter  
squadrons  
concerned,  
etc.

France. Taking gentle evasive action and coming down to 6,800 feet, they made a sweep round the target so as to approach it from the south-east. All six Blenheims dropped their bombs from 6,800 feet at 1249 hours; most of the bombs fell, as intended, among the trees, where they seemed to start two fires. The Blenheims then proceeded homewards. After crossing the French coast near Wissant at 7,000 feet they reverted to a tight formation and put their noses down, so that they arrived over Folkestone at 3,000 feet. At 1329 hours they landed at Hornchurch, the aerodrome from which they had taken off an hour and 39 minutes earlier.

45. While the bombers were executing these manoeuvres, various things were happening to the fighters. The plan of the operation provided that No.56 Squadron should stay with the Blenheims; the other two Hurricane squadrons were to engage the enemy's fighters, or, failing this, come down low and attack an aerodrome and a landing-ground at St. Inglevert. The three Spitfire squadrons were to "act as fighter-cover for the attacking squadrons throughout". (1)

46. Accordingly, Nos. 242 and 249 Squadrons (with Wing Commander Beamish) described two circles over the area between St. Inglevert and Calais at 7,000 to 8,000 feet, but met no enemy fighters at this stage. Nevertheless they refrained from making any concerted attack on the aerodrome or the landing ground, both of which looked inactive. (2) One pilot of No.249 Squadron (Sgt. Maciejowski) became separated from the rest of the formation and opened fire on five Hs.126 aircraft standing on the edge of one

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(1) In this context "the attacking squadrons" seems to have meant the Blenheims and the three Hurricane squadrons.

(2) Photographs taken by No.114 Squadron showed subsequently that there were two aircraft, possibly of bomber type, on the aerodrome.

of the landing-grounds beside the Forêt de Guines. He then saw two Me.109s in the air, one of which he attacked and claims to have shot down. During this manoeuvre his throttle jammed in the fully-open position and he was compelled to return in this condition to Hornchurch, where he landed successfully by switching off his ignition. Another pilot of this squadron attacked a gun-post near the coast. No. 242 Squadron did not open fire.

47. At various points the bomber and fighter squadrons were subjected to anti-aircraft artillery fire, most of it inaccurate. Exceptionally accurate fire came from four boats standing three or four miles off Calais. On the homeward journey Wing Commander Beamish raked their decks with machine-gun fire, and they stopped firing. Over the Channel a pilot of No. 249 Squadron (P/O McConnell) was attacked by an Me.109, wounded, and forced to bale out. Wing Commander Beamish came to his assistance and opened fire at the Me.109, which was seen to fall into the sea.
48. Meanwhile two of the three Spitfire squadrons had followed the Blenheims on their return journey over the French coast. One of them, No. 64 Squadron, was then ordered to patrol the Channel, and did so without incident. The other, No. 41 Squadron, was approached from the rear by five Me.109s just as it was crossing the coast. A pilot of the rearguard section (Sgt. Baker) attacked one of these aircraft and may have destroyed it. The enemy did not pursue the attack further.
49. The third of the Spitfire squadrons, No. 611, had lost touch with the Blenheims and Hurricanes near the target and itself broken into two flights. The flights returned home independently, neither meeting any enemy fighters. One

of the flights came down low at Wissant to attack a gun-post and troops in the streets.

50. So much for the main part of the operation. In support of it three more Spitfire squadrons - Nos. 66, 74 and 92 - patrolled at 7,000 feet and upwards between Dungeness, Cap Gris Nez, Calais and Dunkirk while the main force was over France and returning home. They saw several enemy fighters, flying singly, but none came near enough to be engaged. Two pilots of No. 74 Squadron made premature landings, and one of them died from injuries received in consequence; but these mishaps were not attributable to any action by the enemy.

iv. Conclusions drawn from "Circus I"

51. This operation was generally considered a success.

Report 11G/  
S. 500/13/1/Ops.  
d. 23.1.41;  
F.C./S. 21552,  
minute 36

In most respects the plan conceived beforehand had worked well; and the results, so far as they went, were satisfactory. A military objective had been bombed in daylight without the loss of a single bomber. At least two enemy aircraft were believed to have been destroyed;<sup>(1)</sup> and our losses in combat amounted only to a single Hurricane, whose pilot (P/O McConnell) was in hospital with a broken leg. Incidentally, it had been discovered that German "Flak ships" could apparently be silenced by raking their decks with machine-gun fire.

52. On the other hand, as a test of superiority the operation had been inconclusive, since no major engagement had materialized. Moreover, there was a suspicion in some quarters that we had been lucky not to meet more

Ibid., also  
F.C./S. 21552;  
minutes 37  
and 38

/energetic

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(1) In addition to the two Me.109s claimed as destroyed by Wing Commander Beamish and Sgt. Maciejowski, and that claimed as probably destroyed by Sgt. Baker, an aircraft was seen to be blown to pieces by artillery fire off Calais. This was presumably hostile, since all our aircraft were accounted for.

energetic opposition, which the tendency of our squadrons to break up and come down low might have rendered dangerous. It was concluded that for some time we should be wise to go slowly, and content ourselves with attempts to surprise and confuse the enemy, without risking heavy losses. When "Circus II" was planned, therefore, it was arranged that the fighters should not descend to low altitudes in order to attack objectives on the ground.

v. Other Operations, 10th January to 1st February, 1941

53. No more true "Circus" operations were carried out during the remainder of January or on February 1st. The only other "large-scale offensive patrol" carried out during this period was a sweep over Boulogne and Calais by two squadrons, made after the completion of "Circus I" on January 10th. No enemy aircraft were seen and the patrol was uneventful. (1)

vi. Operations on 2nd and 4th February, 1941

54. The next important day in the development of the fighter offensive was February 2nd. In the morning two squadrons of fighters swept at 10,000 and 15,000 feet respectively over Dunkirk, Calais and Cap Gris Nez, but saw nothing of interest until they reached Dover on the return journey, when they caught sight of five enemy aircraft flying below them; but no combat developed. In the afternoon three squadrons swept at 20,000 feet over Cap Gris Nez and Calais. On the outward journey an enemy bomber was seen over the Channel and attacked without visible effect.

55. In the interval between these two sweeps a more ambitious operation, involving five Blenheim bombers of

/No. 2

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(1) Details or summaries of "Circus" operations, other operations with bombers, and fighter sweeps are given at appendices (IV)E, IVF and IVG.

H. Q. F. C.  
Forms "Y",  
etc.

Ibid.

No. 2 Group and six squadrons of fighters, was carried out. On this occasion the bombers attacked their target - the docks at Boulogne - from 13,000 feet. Their close-escort squadron of Hurricanes flew 500 feet above them and to starboard, with two more Hurricane squadrons on the flank. They were approached before and after the bombing by four pairs of Me.109s., which did not attack and were inconclusively engaged. One Hurricane weaving in front of the formation dived, however, on to a single Me.109 and claimed it as destroyed. The rest of the fighters, comprising three Spitfire squadrons, ran into cloud at 15,000 feet over the Channel, with the result that one of the squadrons became separated from the others and patrolled independently over Calais, Dunkirk and Cap Gris Nez. The other two squadrons proceeded to Boulogne, where they met six or more Me.109s, of which they claimed two as destroyed. One pilot failed to return. The operation as a whole resulted, therefore, in claims to the destruction of three enemy aircraft for the loss of one of ours.

F.C./S. 21552,  
minute 38.

56. This operation was not allotted a number in the "Circus" series. "Circus II" had been planned more than a fortnight before this, but did not take place until February 5th.

H. Q. F. C.  
Form "Y"

57. During the afternoon of February 4th two uneventful sweeps at 20,000 feet over the French coast were made by two squadrons and one squadron respectively.

vii. "Circus II", 5th February, 1941

H. Q. F. C. and  
No. 11 Group  
Forms 540  
(Appendices);  
F.C./S. 21552,  
encl. 61A

58. The intention expressed in the operation order for "Circus II" was to harass the enemy by bombing the aerodrome at St. Omer/Longuenesse and to destroy enemy aircraft in the air. The bombing was to be done by Blenheims of two squadrons of No. 2 Group. In practice

six aircraft from each of these squadrons were despatched. On February 5th these twelve aircraft met their close escort, consisting of one squadron of Hurricanes (No. 601) over Northolt, and left at 1210 hours for Rye. Here, according to the operation order, they were to meet two more Hurricane squadrons (Nos. 1 and 615) and a wing of one Hurricane and two Spitfire squadrons (Nos. 302, 610 and 65) at a time to be notified on the day of the operation. A wing of three more Spitfire squadrons (Nos. 41, 64 and 611) was to leave ten minutes later and cover the withdrawal of the main force.

59.

In practice these arrangements went wrong.

According to No. 11 Group the time of rendezvous over Rye was fixed as 1230 hours. According to No. 2 Group, it had been decided when the operation was planned that to fix a time of rendezvous over Rye was undesirable; instead the Blenheims were to leave Northolt at a specified time, at a specified speed and on a specified course. This they afterwards claimed to have done. However this may be, the facts are that when the Blenheims and No. 601 Squadron reached Rye at 1235 hours, they were met by No. 302 and 610 Squadrons and four aircraft of No. 65 Squadron only. The rest of No. 65 Squadron failed to make contact with them and proceeded independently as far as the French coast, where they turned back. When Nos. 1 and 615 Squadrons reached Rye some time before 1232 hours, they saw "two formations of aircraft" (presumably part of No. 65 Squadron) proceeding across the Channel and set off in pursuit, supposing that they were following the main formation, which in fact had not yet arrived. The remaining wing of Spitfires (Nos. 41, 64 and 611 Squadrons), whose orders were to watch the main formation leave and set off ten minutes later, did not see the bombers and made an independent sweep.

F.C./S. 21152,  
encl. 78A

H. Q. F. C. and  
No. 11 Group  
Forms 540  
(Appendices);  
F.C./S. 21552,  
encl. 61A

60. Thus the main force, instead of proceeding in one formation consisting of the bombers and six fighter squadrons, was broken into three formations, consisting respectively of:
- (a) Twelve Blenheim bombers accompanied by Nos. 601, 302 and 610 Squadrons plus four aircraft of No. 65 Squadron;
  - (b) Nos. 1 and 615 Squadrons;
  - (c) Eight aircraft of No. 65 Squadron.
61. Formation a duly reached the target area. The presence of snow made recognition of the target difficult and two dummy runs were made before nine of the Blenheims dropped their bombs from 7,000 feet; the other three Blenheims, still unable to see their target, did not bomb. Meanwhile No. 610 Squadron were attacked from above and behind by twelve Me. 109s. Combats which followed and in which the four aircraft of No. 65 Squadron took part, resulted in the loss of three of our pilots and the wounding of a fourth. One Me. 109 was claimed as destroyed.
62. Formation b were attacked by at least six Me. 109s and lost two pilots in combat. On the return journey two pilots of No. 615 Squadron collided; one was killed and the other wounded.
63. Formation c turned back on reaching the French coast and were not in combat.
64. Nos. 41, 64 and 611 Squadrons, making their independent sweep, saw only four Me. 109s, of which they claimed the destruction of one (and the probable destruction of another) for the loss of one pilot.
65. As a sequel to "Circus II", five more fighter squadrons (including the "Duxford Wing" from No. 12 Group) swept over the area between Calais, Cap Gris Nez and Le Touquet soon afterwards. Although they remained over

France for half an hour, they saw no enemy aircraft. One pilot failed to return from this patrol and was believed to have landed in France.

66. Thus altogether "Circus II" and its sequel resulted in claims to the destruction of two enemy aircraft. Seven of our pilots were lost on operations and an eighth as the result of a collision.

viii. Further Operation on 5th February, 1941

67. A further operation with bombers was carried out during the afternoon of February 5th. This was directed against destroyers off the Belgian Coast, which were to be attacked by six Blenheims. The contribution of the home defence force was limited to the provision of a fighter escort of three Spitfire squadrons. These squadrons accompanied the Blenheims - of which five actually took part in the operation - from Dover to Knocke, where the Blenheims dived through clouds to attack an alternative target and were lost to sight. The fighters eventually returned home without further incident.

ix. Review of "Circus" Policy and Plans after "Circus II"

68. The unfavourable results of "Circus II" raised the question whether these operations were worth continuing. After various views on the causes of the misadventures of February 5th had been expressed, the Chief of the Air Staff informed the Prime Minister, <sup>(1)</sup> in a minute dated February 9th, of his opinion that, if certain lessons were learnt from this experience, there would be "every advantage in continuing these operations". The bad results of February 5th he attributed to:

- (a) Unexpected weather conditions which had interfered with the arrangements for rendezvous and led to straggling and bad timing.

/(b)

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(1) The Prime Minister (The Rt.Hon W.S. Churchill) was also Minister of Defence.

- (b) A tendency to regard the bombing as the raison d'être of the operation. This had led to the selection of an objective too far from the French coast. Moreover, the bombers had remained too long in the target area "taking deliberate shots at their target", thus making it difficult for the fighters to manoeuvre.

69. These views were conveyed to the Air Officers Commanding-in-Chief, Bomber and Fighter Commands, who proceeded to consider what adjustments of the existing instructions for Operation "Circus" were required. Their enquiries disclosed discrepancies between the accounts of the intention of the operation given in various documents issued up to the present. In No.11 Group's original "Operation Instruction" of December 24th, 1940, the intention was stated to be:

Ibid  
encl. 65A and  
80A

"To take offensive action which will  
" harass the enemy, force him to adopt  
" defensive preparedness and enable our  
" patrols to meet him in the air with the  
" tactical advantages of height and surprise."

70. This instruction had just been superseded by another (dated February 8th, 1941) and this clause amended to read:

"To bomb selected targets, and to take  
" advantage of the enemy's reaction to shoot  
" down his fighters under conditions  
" favourable to our own fighters."

71. On the other hand, in a directive issued by Bomber Command to No.2 Group on January 23rd, 1941 occurred the words:

"The primary object of these attacks  
" is to deny the enemy the use of the  
" nearer ports as invasion bases or as  
" bases for his coastwise shipping and  
" to put him on the defensive in the  
" narrow waters. The secondary aims  
" are to force him to put his fighters  
" into the air and to accept combat  
" under conditions tactically  
" favourable to our fighters."

72. If the views of Bomber Command and No.11 Group, as expressed in the last two documents quoted, were not incompatible, they certainly showed a difference of emphasis; and neither was quite compatible with those of the Air Staff, which were that the bombers were only needed to make the enemy come up and fight, and that after dropping their bombs they should get away at once. That the instructions to be circulated in both Commands must be re-drafted so as to be mutually compatible and also compatible with the views of the Air Staff was not in dispute; the difficulty was to know how to effect this synthesis, since the Air Officer Commanding-in-Chief, Bomber Command, considered it essential to bomb in a manner which the enemy could not ignore, and was inclined to deprecate any suggestion that his squadrons should be used as "bait".

Ibid.,  
encl. 65B

Ibid.,  
encl. 80A

73. It was therefore decided that the problem must be discussed by the respective Commanders-in-Chief in the light of the following principles, enunciated by the Chief of the Air Staff:

Ibid.,  
encl. 82A

- (a) The exercise of the initiative was valuable irrespective of the material results achieved.
- (b) There was no immediate prospect of denying even a limited number of ports to the enemy with the resources available for operation "Circus".
- (c) It would therefore be a pity to spoil the chances of the fighters by making them conform to the needs of a bomber force bent exclusively on inflicting material damage by bombing.

74. At their meeting, which occurred February 15th, the Commanders-in-Chief, who were attended by representatives of Nos. 2 and 11 Groups, agreed to define the intention of operation "Circus" in future in the following terms:

"The object of these attacks is to force  
" the enemy to give battle under conditions  
" tactically favourable to our fighters.  
" In order to compel him to do so the bombers  
" must cause sufficient damage to make it  
" impossible for him to ignore them and refuse  
" to fight on our terms."

75. This formula was also accepted by the Air Officer Commanding-in-Chief, Coastal Command, who had agreed to participate in occasional "Circus" operations. It was agreed, however, that it would not apply to attacks on shipping, in which the bombers would call the tune.

Ibid.,  
encl. 55A,  
67A, 85A,  
93A

x. Operations on 10th and 11th February, 1941

76. In the meantime, on February 10th "Circus III", "Circus IV" and "Circus V" had been carried out and on February 11th another small fighter sweep made. Once again the results were not entirely satisfactory. "Circus III" involved an attack from 7,000 to 8,000 feet on the docks at Dunkirk by six Blenheim bombers of No. 2 Group, escorted by three squadrons of Hurricanes. The weather was good. Not more than a dozen enemy fighters attacked the formation; two of these were claimed as destroyed and one of our pilots failed to return. Simultaneously six Blenheim bombers of No. 16 Group, Coastal Command, escorted by two-and-a-half squadrons of Hurricanes, carried out "Circus IV". The bombers attacked the docks at Boulogne from 7,000 to 8,000 feet and no enemy fighters appeared. In connection with these two operations a wing of Spitfires flew a "mopping-up" sweep over the area of operations, but met no fighter opposition.

Report  
14G/S. 500/  
13/3.Ops.  
d. 11. 2. 41,  
etc.

77. So far, so good. "Circus V", however, which took place later on the same day, was less successful. In this operation six Blenheim bombers of No. 16 Group, Coastal Command, escorted by three squadrons of Hurricanes and one of Spitfires, attacked the docks at Calais from 7,000 to 8,000 feet. Only slight fighter opposition (in addition to fire from the ground) was reported; nevertheless three fighters were lost, and although one pilot was rescued from the sea, the other two remained missing. Thus the three "Circus" operations resulted in the aggregate in claims to the destruction of two Me.109s and the loss of three pilots.

78. On the following day one of two squadrons of Spitfires sweeping at 18,000 feet over the neighbourhood of Boulogne was attacked out of cloud and from astern by about five Me.109s. Two pilots at the rear of the squadron failed to return and were apparently shot down by these Me.109s.

xi. Further Review of Situation after Operations of 10th and 11th February, 1941

79. At this stage operations hardly appeared to be going according to plan. The six "Circus" patrols (one un-numbered) carried out so far had resulted in claims to the destruction of nine enemy aircraft and the loss of eleven pilots in battle. Fighter sweeps without bombers had produced no combats under favourable conditions, but two pilots had been lost. In addition an operation directed against destroyers had been carried out without gain or cost to the fighters. In the words of Air Marshal Douglas:

"Our idea was to go over the other side  
" and leap on the enemy from a great  
" height in superior numbers; instead of  
" which it looks as though we ourselves  
" are being leapt on."

80. He added that in his opinion the trouble was mainly due to the operations being carried out at too low an altitude. He considered that the lowest squadron accompanying the bombers should never be lower than about 18,000 or 20,000 feet, which would enable the highest squadron to fly at 30,000 feet. There were certain practical difficulties in the way of getting the Blenheim bombers to a height which would make this feasible. Nevertheless it was decided, when the new arrangements for operation "Circus", arising out of the need to re-define the intention of the operation, were discussed, that in future the bombers would attack from 17,000 feet "or higher if found practicable".<sup>(1)</sup> They would also avoid sudden changes of course, height or speed, and make only one run over the target. Moreover, they would generally abstain from putting their noses down over the Channel on their homeward route, and so enable their fighter escort wing to hand part of the responsibility for protecting them over to a "mopping up wing" arriving from England at a pre-determined height.

F.C./S. 21552,  
encl. 81A

F.C./S. 21552,  
encl. 97A and  
101A

81. The fighters, for their part, would assume definite roles according to their position in the formation. An "escort wing" would accompany the bombers from the moment they left the place of rendezvous until they arrived at the French coast on their way home. It would consist of a "close escort squadron", which would remain with the bombers at all times, including the homeward journey across the Channel, flying 1,000 feet above them and slightly behind; and usually of two "escort squadrons" which would fly on the flanks and to the rear at heights in the neighbourhood

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(1) However, in practice even the theoretical minimum was seldom achieved.

of 20,000 and 25,000 feet respectively. These two squadrons might in certain circumstances be released from their escort duties when the French coast was reached on the way home. Further back there would be a "high cover wing" consisting of two or three squadrons stepped up at heights between 25,000 and 30,000 feet. In addition there might be a "mopping-up wing" whose duty it would be to arrive off the French coast at 25,000 to 30,000 feet as the bombers and close escort squadron were crossing it on their way home. They would protect the bombers and close escort squadron during their return journey across the Channel, thus releasing the escort squadrons and high cover wing to engage enemy aircraft. Afterwards, if conditions permitted, the mopping-up wing would sweep back towards the French coast and render assistance to the escort squadrons and high cover wing.

82. Comprehensive instructions to this effect were issued during the third week in February. At the same time, pilots of Fighter Command were reminded that most of the casualties suffered in past operations had been due to "straggling", or failure to "weave" and keep an adequate look-out above and behind.

xii. Operations "Roadstead" and "Sphere": Definitions

83. It had been understood from the beginning that such conditions as these would not apply to attacks on nautical objectives selected by Coastal Command. In such cases accurate bombing was essential and the role of the fighters was merely to provide adequate protection for the bombers. Separate instructions were therefore issued for this class of operation, to which the code-name "Roadstead" was applied.

84. Yet another offensive operation was devised at this time in the shape of a special form of high-flying fighter sweep designed to inflict casualties on the standing patrols

F.C./S. 21552,  
encl. 97A and  
101A

Instruction  
11G/S. 500/42/  
Ops., d.  
22. 2. 41

Memorandum  
11G/S. 500/41/  
Ops., d.  
14. 2. 41

over the French coast which the enemy had begun to maintain, possibly as a response to operation "Circus". These sweeps were to be made by small formations of fighters (up to six aircraft in strength) of No. 91 Squadron, <sup>(1)</sup> which would patrol at a high speed and an altitude of 30,000 feet or more over the area between Le Touquet, Dunkirk and Calais. The code-name "Sphere" was given to this operation.

xiii. Operations 12th to 28th February, 1941

85. The first "Circus" operation planned in accordance with the new instructions was "Circus VI", which was carried out on February 26th. Twelve Blenheim bombers of No. 2 Group provided the striking force, and flew as required at 17,000 feet, from which height ten of them attacked the target - once again, the docks at Calais. As a test of the new arrangements the operation was somewhat disappointing, since very few enemy fighters were met. The escort wing and high cover wing had no combats. Pilots of the mopping-up wing had a few fleeting engagements but made no claims. One pilot failed to return, having baled out off the French coast after his aircraft had apparently been hit by anti-aircraft fire.

Report  
11G/S. 500/13/  
3/Ops. d.  
27.2.41, etc.

86. On the other hand "Roadstead I", an attack on a convoy off Dunkirk carried out on February 25th in consequence of a reconnaissance report by a pilot of No. 91 Squadron received earlier in the day, resulted in a minor but profitable engagement. The six Blenheim bombers of No. 16 Group which constituted the striking

Report 11G/  
S. 500/42/1/  
Ops. (date  
illegible)  
etc.

/force

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(1) No. 91 Squadron had recently been formed out of No. 421 Flight - the special flight formed in 1940 to report on the characteristics of enemy raids approaching this country. Its duties now included weather and shipping reconnaissance flights and "Rhubarb" patrols, and eventually also the provision of escort for Air/Sea Rescue operations. From the beginning of May onwards its duties were shared by No. 601 Squadron.

force were accompanied by an escort wing of three squadrons flying at heights in the neighbourhood of 7,000 feet. One of these squadrons was split into two flights by anti-aircraft fire and a single enemy fighter then dived on to one of its aircraft, which suffered damage. A "high offensive wing" of three Spitfire squadrons was to have swept over the target area during the attack, but one of the squadrons missed the others at the rendezvous and swept independently over Boulogne and Calais at 17,000 to 29,000 feet without meeting any enemy aircraft. The other two squadrons began to sweep as planned, but separated after one of them had been attacked when at 25,000 feet by twelve Me.109s. One Spitfire was damaged in this engagement. The other squadron later saw six Me.109s below it and joined combat, with the result that three Me.109s were claimed as destroyed for the loss of one Spitfire pilot. Two squadrons of No.12 Group made an uneventful supporting sweep over the Straits of Dover at 27,000 feet.

87 Several fighter sweeps, including three "Sphere" patrols, were flown between the middle and end of February, but none resulted in any casualties on either side.

xiv. "Circus VII", 5th March, 1941

88. "Circus VII", which involved an attack by six Blenheim bombers on the docks at Boulogne, was carried out on March 5th, and was notable for a number of misadventures. It was arranged that Nos. 601 and 303 Squadrons should act as escort, while Nos. 610, 616 and 145 Squadrons; operating from the Tangmere Sector, were to act as high cover wing. Nos. 54 and 611 Squadrons from the Hornchurch Sector were to join Nos. 92 and 609 Squadrons from the

Report  
11G/S. 500/13/  
Ops. d. 9.3.40;  
F.C./S. 21552,  
encl. 104A, B, C,  
106A, 107A,  
minutes 203  
and 105

/Biggin

Biggin Hill Sector in an offensive sweep from Le Touquet to Gravelines. The bomber and escort wing were to make rendezvous with the high cover wing at 1300 hours.

89. These orders appears to have been given to the Tangmere Sector (among other recipients) between 1000 and 1030 hours on the day of the operation. For some reason No. 610 Squadron, which was to lead the high cover wing, does not seem to have received them until about two hours later, so that there was no opportunity for its Commanding Officer to discuss the plan with those of the other squadrons. In point of fact this officer was not available at the time of the operation, with the result that the squadron and the wing were led by a Flight Commander. Although at 1215 hours, when No. 610 Squadron at last received its orders to take off in a quarter of an hour's time, one section of the squadron was actually in the air on a different operation, this Flight Commander succeeded in getting the squadron into the air at the correct time and the whole of the high cover wing over Hastings at 1300 hours, with its squadrons at 23,000, 24,000 and 25,000 feet. There was no sign of the bombers or escort wing, which did not arrive until five minutes later. The Tangmere wing therefore climbed another 5,000 feet, which brought the squadrons to the height at which they were to operate. The wing then circled, looking for the bombers and escort wing; in doing so the three squadrons became separated and lost touch with each other in cloud. Meanwhile the bombers and escort wing arrived at the rendezvous, left without the high cover wing for their objective, and accomplished their mission without anything untoward occurring.

90. At about 1315 hours the leader of the high cover wing asked the Tangmere Controller for instructions, informing him that he could not find his "friends", by

/which

which he meant the bombers and escort wing. The Controller seems to have taken "friends" to mean Nos. 616 and 145 Squadrons, but realizing later that the bombers must have left, he ordered the high cover wing to fly towards Boulogne. Since the three squadrons had now lost touch with each other, they carried out this order independently, without ill effect as regards Nos. 616 and 145 Squadrons, except that No. 145 Squadron ran out of oxygen and turned back before reaching Boulogne. No. 610 Squadron, however, when off the French coast below 30,000 feet with orders to gain height as enemy aircraft were believed to be approaching, were attacked from 500 feet above by four Me.109s. A general combat ensued, in the course of which one pilot saw six more Me.109s approaching. When it was over the squadrons discovered that they had lost four pilots, one of whom crashed in Sussex and was killed, while the fate of the others remained unknown.

91. The two squadrons from the Hornchurch Sector duly made rendezvous with the two from Biggin Hill, but subsequently, while climbing through cloud to their operational heights, the two pairs of squadrons lost touch and proceeded separately. The Biggin Hill squadrons swept over the Channel without incident at 32,000 and 34,000 feet. The Hornchurch squadrons broke into two formations when some aircraft at first believed to be hostile were seen over the Channel. Subsequently No. 54 Squadron were in combat with several Me.109s and claimed the destruction of one of them.

92. Thus the operation as a whole resulted in claims to the destruction of one Me.109 for the loss of four pilots. In addition six Me.109s were claimed as probably destroyed.

xv. Review of "Circus" Policy after "Circus VII"

F.C./S. 21552,  
minute 103  
and encl.  
104B

93. The unfortunate results of this operation led to the value of operation "Circus" as a whole being questioned once again. It was pointed out that so far there had been ten operations with bombers and that the cost of these in pilots lost exceeded the number of enemy aircraft claimed as destroyed. (1) It could hardly be claimed, therefore, that the operations were achieving their main object, which was - in the case of operation "Circus", though not, strictly speaking, of operation "Roadstead" - "to bring about a fighter battle on our initiative and under circumstances advantageous to ourselves". On the contrary, what usually happened was that on arriving over France, our main formation found only a few enemy fighters in the air. These refused a general engagement and awaited an opportunity to take some of our aircraft at a disadvantage. By the time the bombing was over, enemy fighters had begun to appear in larger numbers; but our main formation was now in no position to fight a major battle, since its fuel and oxygen were tending to run low. It was true that the device of the "mopping-up wing" was intended to exploit this situation, but in practice these wings seldom achieved the desired result.

94. It was therefore argued that to continue the offensive might tend to our disadvantage. The proportion of pilots in Fighter Command with war experience was comparatively low; the Command might have to fight a major defensive before long; and there was a feeling in some  
/quarters

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(1) The eight "Circus" operations and two operations against shipping had resulted in the loss of seventeen pilots in battle and claims to the destruction of thirteen enemy aircraft. An analysis made at the time gave the number of pilots as 15; but this seems to have been a mistake.

quarters that the time and effort spent on offensive operations could be more profitably spent on training.

95. The Air Officer Commanding-in-Chief, Fighter Command did not accept these arguments. He recognized that only thirteen enemy aircraft had been claimed as destroyed in the operations; but besides these, eleven had been claimed as probably destroyed, and he considered that a proportion of these should be counted to our credit. On this basis, he thought that the number of enemy aircraft we had shot down was probably greater than the number of pilots we had lost. In any case he was in favour of continuing the offensive for the sake of its other material and moral effects on the enemy. At the same time, he agreed that the standard of experience and training in the Command left something to be desired. He believed, however, that the remedy lay in freeing pilots for training by maintaining a lower state of defensive readiness, rather than in giving up offensive operations, which themselves provided valuable experience.

96. For the present, therefore, no special restriction was placed on the authority of the Air Officer Commanding, No.11 Group, in consultation with the Air Officer Commanding No.2 or No.16 Group, to order an offensive operation whenever conditions allowed. In practice the scale of effort was limited by the weather and by the size of the bomber force available, which consisted normally of two squadrons of No.2 Group,<sup>(1)</sup> supplemented on occasions by not more than twelve aircraft from two squadrons of No.16 Group.

/xvi.

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(1) These had a "contingent liability" for night operations.

xvi. Other Operations in March 1941

97. During March there was one more "Circus" operation as well as a "Roadstead" and eight fighter sweeps.
98. In "Circus VIII", which took place on March 13th, a different disposition of squadrons and different timing were tried. The bombers and escort wing flew alone to and from the target - the aerodrome at Calais/Marck. The escort wing consisted of a close escort squadron and an escort squadron at 17,500 and 20,000 feet respectively, and a "high cover squadron" at 28,000 feet. On the outward journey the high cover squadron successfully repulsed an attack from 5,000 feet above by a small number of Me.109s. Another six fighter squadrons were employed in two wings to sweep from opposite directions over the target area, where they were due to arrive 40 minutes after the bombing, at heights between 28,000 and 33,000 feet. The topmost squadron in one of these wings was followed for some miles and eventually attacked from 3,500 feet above by enemy fighters; combats followed, at the conclusion of which the Squadron Commander was found to be missing. The lowest squadron in the other wing met a few Me.109s and claimed one as destroyed. Thus the whole operation resulted in the loss of one pilot and a claim to the destruction of one enemy aircraft.
99. "Roadstead II" took place on March 31st and was directed against a small convoy reported by a pilot of No.91 Squadron. Either this or a similar convoy was duly attacked by six Blenheim bombers of No.16 Group, with two squadrons of fighters as close escort and three more as cover. Another two squadrons made an offensive sweep over the scene of the attack. Only a few enemy aircraft were seen and there were no combats.

Report 11G/  
S. 500/13/3/  
Ops. d.  
16.3.41,  
etc.

H. Q. F. C.  
Form "Y",  
etc.

100. The eight fighter sweeps without bombers which were flown during March were slightly more eventful and also more successful than previous operations of this kind. On four of them enemy fighters were seen and on one occasion combats led to claims to the destruction of three Me.109s. A pilot failed to return from a sweep on March 10th, but as the rest of those involved reported no opposition the cause of this loss could not be determined. In addition, an enemy aircraft was claimed as destroyed by a pilot of No.91 Squadron on reconnaissance.

xvii. Modifications of Offensive Policy and Plans in April: Operation "Blot" and move of Blenheims to Manston

101. It had been decided in February that the object of operation "Circus" was to force the enemy to give battle on terms favourable to ourselves. However, it had always been recognized that the need would sometimes arise to attack a target in conditions relatively unfavourable to the escorting fighters, either because of the range involved, the necessity of bombing from a low altitude, or both. Operation "Roadstead" was an example of such operations, in which the bombers rather than the fighters called the tune.

102. In April it was decided that, as part of a programme of surprise attacks in daylight on targets near the coasts of countries occupied by the enemy, most of which would be made under cover of cloud, Bomber Command should occasionally make low-level or medium altitude attacks on such objectives without cloud-cover but with a fighter escort. The code-name "Blot" would be given to such operations. In certain circumstances a "Circus" operation might be carried out at the same time, as a diversion.

Instructions  
11G/S. 500/46/  
Ops. and 11G/  
S. 500/13/Ops.  
both d.12.4.41;  
and S. 8500,  
passim.

Instruction  
11G/S. 500/48/  
Ops. d. 25.4.41

103. It was also decided in April, partly as a result of experience gained in "Roadstead II", that the scope of operations against shipping should be extended by basing a small bomber force at Manston, where it would be quickly available to attack vessels reported by aircraft on reconnaissance or naval sources. Accordingly arrangements were made towards the end of the month for one flight of No.101 Squadron of No.2 Group (equipped with Blenheim bombers) to operate in future from Manston, where a number of Blenheims would be maintained at thirty minutes' readiness.

xviii. Operations in April, 1941

104. The operations carried out in April comprised "Circus IX", "Blot I", "Blot II", two attacks on shipping, and some 30 fighter sweeps by formations varying from a flight to three squadrons.

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Ops. d. 19.4.41

105. "Circus IX" was carried out on April 16th. The objective for the six Blenheims of the bomber force was the aerodrome at Berck-sur-Mer. They were accompanied by a close escort squadron and two escort squadrons. Both the escort squadrons were persistently attacked by enemy fighters on the homeward journey; two of our pilots were lost and one Me.109 was claimed as destroyed.

106. "Blot I" took place on the following day. The target was the docks and harbour at Cherbourg, against which eighteen Blenheim bombers of No.2 Group, with an escort wing and high cover wing, were despatched. (1) The enemy seems to have been taken by surprise and the crews reported that they were able to make a very accurate attack from 13,000 feet. Two Me.109s followed the formation on the homeward journey, but there were no combats.

/107.

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(1) A "Circus" to Cherbourg had been suggested in February. It had been decided that the distance was too great for a "Circus" but that escort to bombers might nevertheless be provided if the size of the bomber-force and importance of the target justified the risk.

107. "Blot II", which followed on April 21st, was less successful. Seventeen Blenheim bombers of No.2 Group, escorted by a wing of Spitfires, were despatched to bomb Le Havre. They found their target obscured by cloud and sought alternative objectives some distance to the west. This manoeuvre disconcerted the escort wing, which was operating near the limit of its range. One of the escort squadrons was returning across the Channel in line astern at 500 to 600 feet, because of a shortage of petrol, when a pilot baled out and was not seen again. It is thought that his aircraft had been attacked by two Me.109s which were subsequently seen flying back towards France. There were no other combats.

108. The two "Roadstead" operations on April 28th and 29th both produced combats, in which one Me.109 was claimed as damaged and one of our pilots was lost. Fighter sweeps without bombers, which included a number of "Sphere" patrols by various squadrons besides No.91, resulted in claims to the destruction of four enemy aircraft and the loss of five pilots. Besides these, an enemy aircraft was claimed as destroyed and a pilot lost in operations by Nos.91 and 92 Squadrons against an enemy seaplane which was being towed by a trawler off the French coast; while a pilot of No.91 Squadron on a reconnaissance flight claimed the destruction of an enemy aircraft on April 21st. Thus the month's offensive operations, other than "Rhubarb" patrols, resulted together in claims to the destruction of seven enemy aircraft and the loss of ten pilots.

xix. "Circus X" and "Circus XI"

109. At the end of April, plans were laid for the two most ambitious "Circus" operations projected up to this time. They were to be carried out on the same day. In the morning eighteen Blenheims of No.2 Group, accompanied by an escort wing of three squadrons, were to attack a

/benzole

Report 11G/S.  
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24.4.41

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Forms "Y"  
Group monthly  
reports, etc.

Instruction  
11G/S.500/13/  
Ops. d.30.4.41

benzole refinery at Gosnay, near Béthune. Shortly before they reached their target, a wing of two squadrons was to arrive over St.Omer for the purpose of forestalling enemy fighters. Simultaneously another wing of two squadrons was to arrive over Berck for the same purpose. The withdrawal of each of these wings was to be covered by an additional squadron. Another squadron was to sweep in two flights at a very high altitude, between St.Omer and the coasts to the north and west; and, finally, a wing of three squadrons was to cover the withdrawal of the bombers and escort wing. This would be "Circus X".

110. "Circus XI" was to follow in the afternoon and would consist of an attack on the aerodrome at St.Omer/Longuenesse by twelve Blenheims of No.2 Group, accompanied by an escort wing of three squadrons. A wing of two squadrons was to arrive over the target area some minutes ahead of the bombers and escort wing for the purpose of engaging enemy fighters; and another wing of two squadrons was to visit Berck. Another squadron was to cover the withdrawal of this wing. The morning's high-altitude sweeps between St.Omer and the sea were to be repeated. Finally, a wing of three squadrons was to cover the withdrawal of the bombers and escort wing. Thus the day's operations would involve 30 bomber sorties and no less than 25 squadron sorties by fighters.

111. The day eventually selected for these operations was May 21st. The weather was generally good, but marred by haze which was expected to clear later. In fact it cleared only very gradually, so that it was necessary to postpone "Circus X" until 1700 hours and cancel "Circus XI". "Circus X" was carried out on the lines planned, with a wing of three squadrons from No.12 Group providing additional withdrawal cover between Canterbury and Dover.

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S.500/13/Ops.,  
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and Form "Y",  
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There was still some haze about and the fighters had difficulty in seeing enemy aircraft in good time. Moreover, the chances of the wings which were to reach St. Omer and Berck before the bombers arrived at their target may have been prejudiced by the arrival of the bombers and escort wing at the French coast a few minutes before their appointed time. Whether this was so or not, it is certain that the bombers and escort wing were attacked on their way to the target by enemy aircraft which might conceivably have been intercepted by the forward wings if the time-table had been scrupulously observed. One Blenheim was shot down, while the escort wing lost three pilots and claimed the destruction of three Me.109s. Another Me.109 was claimed by a Blenheim. The rest of the fighters met no enemy aircraft until the later stages of the operation, when various combats resulted in a claim to the destruction of one more Me.109 and the loss of three more pilots. These figures do not include two pilots who were killed when their aircraft collided.

xx. Other Operations, 1st May to 13th June, 1941

112. No more "Circus" operations were carried out during the period now under consideration. During May and the first thirteen days of June there were, however, nine "Roadstead" operations and 35 fighter sweeps, including 22 "Sphere" patrols. From the fighter aspect the "Roadstead" operations resulted in claims to the destruction of three enemy aircraft and the loss of five pilots. The fighter sweeps resulted in claims to the destruction of two enemy aircraft and the loss of one pilot, not including two who were killed on May 13th as the result of a collision. Besides these, pilots of Nos. 145 and 601 Squadrons on reconnaissance flights claimed the destruction of enemy aircraft on May 5th and June 2nd.

/Summary:

Summary: The Fighter Aspect of the Daylight Offensive as a whole

113. The development of the various operations making up the fighter aspect of the daylight offensive has now been traced from their commencement up to June 13th, 1941. A few days later a new strategic situation caused by the imminence of Germany's attack on Russia led to a change in policy involving a substantial increase in the scale of the offensive. It happened that for some weeks past unfavourable weather had caused the suspension of major offensive operations and that they began on June 14th. This date, although anterior to the change of policy caused by the imminence of the campaign in Russia, has usually been regarded as marking the beginning of the intensive phase of the offensive; and this precedent has been followed here.
114. It remains to assess the broad results, from the fighter aspect, of the phase which ended on June 13th. The operations carried out fall into the following classes
- (a) Operation "Rhubarb".
  - (b) Operation "Circus" (in its narrow sense).
  - (c) Operations "Roadstead" and "Blot".
  - (d) Fighter sweeps, including operation "Sphere".
115. In classes a, b and d the immediate aim of the fighters was to destroy as many enemy aircraft as possible at the smallest cost to themselves. In class c this was not their immediate or primary aim; their function in this case was to protect the bombers they were escorting and engage enemy aircraft only if it were necessary to do so for this purpose. This was the theory, at least; in practice a "Roadstead" patrol was more than once made the occasion for a substantial fighter operation, so that in effect it became a "Circus".

116. To what extent was this immediate aim achieved in practice? To approach this question first from the point of view of the claims to the destruction of enemy aircraft made by our pilots, the alleged results of the different classes of operation were as follows:

|  | <u>"Rhubarb"</u> | <u>"Circus"</u> | <u>"Roadstead"</u><br>and<br><u>"Blot"</u> | <u>Fighter</u><br><u>Sweeps</u> | <u>Total</u> |
|--|------------------|-----------------|--|---------------------------------|--------------|
| Enemy aircraft claimed as destroyed      | 7                | 16              | 7  | 9                               | 39           |
| Our pilots lost                          | 8                | 25              | 8  | 9                               | 50           |
| Squadron sorties per e/a claimed         | 4.0              | 5.8             | 7.4  | 11.4                            | 7.1          |
| Pilots lost per Squadron sortie          | 0.3              | 0.3             | 0.2  | 0.1                             | 0.2          |
| Pilots lost per e/a claimed as destroyed | 1.1              | 1.6             | 1.1  | 1.0                             | 1.3          |

117. In addition, the destruction of five enemy aircraft was claimed by fighters on reconnaissance and miscellaneous operations of an offensive nature not included in any of the foregoing categories.

118. On this showing, "Rhubarb" operations, although in practice they seldom seemed to lead to the destruction of enemy aircraft, were actually the most successful in terms of the ratio of enemy aircraft claimed as destroyed to sorties flown. "Roadstead" and "Blot" operations, as might be expected, showed a poor dividend in terms of enemy aircraft destroyed - indeed, this was not their aim - offset by a satisfactorily low rate of loss. Even so, they gave a better return than fighter sweeps, whose only merit, apparently, was cheapness.

It would be rash to assume, however, that these figures tell the whole story. It was sometimes alleged that, whereas an enemy aircraft destroyed by a pilot flying a "Rhubarb" patrol was almost certain to be claimed as such, a pilot flying in a "Circus" at 20,000 feet or more might well destroy an enemy aircraft and neither he nor any of his squadron see it go down. Even though the risk of duplicated claims was probably greater in "Circus" patrols than in other operations, there would, on this ground, be something in the argument that some of the aircraft claimed by pilots as "probably destroyed" ought to be counted as destroyed. Much stronger support for this argument is to be found, in the present case, in the records of the Luftwaffe, which show that between January 1st and June 13th, 1941 the Germans lost in active operations on their own side of the Channel 58 aircraft of day-fighter type. (1) From this figure losses definitely attributed by the records to collisions, accidents on take-off or landing, or destruction by their own side have been excluded. British claims to the destruction of enemy aircraft in daylight offensive operations during this period, including fighter reconnaissance sorties, amount, as has been seen, to 44 enemy aircraft. Even when allowance has been made for one or two enemy aircraft claimed by No. 2 Group and for possible errors of interpretation, it would seem that during this period of comparatively slight activity the claims of our pilots were on the modest side. In any case it seems clear enough that, counting British fighter pilots against German fighter aircraft, the advantage up to this point lay with us.

Records of  
6th Abteilung  
(Q.M.G.),  
German Air  
Ministry

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(1) This figure is the total for units based in France and the Low Countries. It does not include any losses by units based in Norway.

120.

However, as has been pointed out above in discussing operation "Rhubarb", the value of the fighter offensive cannot be measured solely, or even mainly, in terms of statistics. Its underlying purpose at this stage was to assert the initiative and force the enemy to defend himself. This it did. To what extent this process was complete by the middle of June is not quite clear. A responsible German officer has testified that the Luftwaffe first began to take the daylight bombing offensive seriously "around April .... when the Blenheims and Bostons came over in formations of about two dozen, with a Spitfire and Hurricane escort three times as strong". No Bostons were used in these attacks either in April or at any time up to the middle of June; and the largest number of bombers that took part in any operation during this period was eighteen, the more usual number being six. The same witness has stated that it was because of the daylight bombing offensive that the whole of the important fighter Geschwader, J.G. 2 and J.G. 26, were retained in the west when the Russian campaign opened, instead of elements of these units being sent in rotation to the eastern front, as had been planned earlier in the year. It may be, therefore, that the forces responsible for the daylight offensive had, unwittingly, already extended a helping hand to the Russians when the campaign on that front opened. Whether that was so or not, a tremendous effort to give such assistance was to be made during the next few months.

A.D.I. (K)  
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1945, paras.  
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PART FIVE

THE FIGHTER ASPECT OF THE DAYLIGHT OFFENSIVE

FROM THE EVE OF THE GERMAN ATTACK ON

RUSSIA TO THE END OF 1941

PART FIVE

THE FIGHTER ASPECT OF THE DAYLIGHT OFFENSIVE  
FROM THE EVE OF THE GERMAN ATTACK ON  
RUSSIA TO THE END OF 1941

The Strategic Situation Created by the  
German Threat to Russia

i. Early Development

C.O.S. (41)  
311, 325, 350,  
357, 370, 385.

FC/S.24752,  
encl. 78B.  
etc.

1. During May and the early part of June, 1941, H.M. Government and the Service Ministries received information which suggested that an attack on Russia by the Germans was impending. By the middle of June it was clear that units of the Luftwaffe had been withdrawn from the Western Front in considerable numbers and that they were likely to be used against the Russians.

2. At this time it appeared that in such a struggle the advantage would lie, on the whole, with the Germans, who would be unlikely to embark on such a campaign unless persuaded of the possibility of a rapid victory, which would leave them free to concentrate their forces once more in the west. Clearly it would be to the interest of Great Britain and the Dominions to prevent this rapid victory and, by helping to prolong Russian resistance, gain a respite which would favour the development of their own programme of expansion.

FC/S.24752,  
encl. 7A

3. In conformity with this principle, on 17th June, the Chief of the Air Staff instructed the Commanders-in-Chief of the three operational Home Commands to discuss and report on the most effective means open to them of preventing the enemy from withdrawing further air forces from the west and compelling him to return some of the forces already withdrawn "particularly in the event of operations developing against Russia".

ii. Recommendations of the Commanders-in-Chief

4. The three Commanders-in-Chief, with members of their Staffs, met at Headquarters, Fighter Command on  
/Thursday

Ibid.,  
encl. 5B

Thursday, June 19th.<sup>(1)</sup> After discussing various possible methods they agreed that such daylight attacks on Germany as Bomber Command could make under the conditions then existing were not, of themselves, likely to achieve the desired result, and that a better plan would be to attack objectives within the range of escorting fighters. This might induce the enemy to concentrate near the French coast such fighters as he still had in the west. Unescorted bombers might then hope to reach west and north-west Germany round the flank of the defences and this in turn might persuade the enemy to bring back fighters from the east. It had been noticed that in the past he had reacted most strongly to attacks which seemed to menace the industrial area round Lille, Bethune and Lens, and it was agreed that objectives in this area were the most likely to prove profitable.<sup>(2)</sup>

5. As a corollary to this offensive, it was proposed that night attacks should be made on communications in the Ruhr and shipping passing through the Straits of Dover be intensively attacked. This two-pronged offensive would, it was thought, constitute a threat to communications between France and Germany which the enemy could not afford to ignore, so that he might well be induced to bring back fighters from the east in order to meet it.

6. The Commanders-in-Chief also proposed that the other Services should be invited to share in simulating preparations for a landing in France, which might also deceive the enemy into strengthening his air forces in the west. Finally, they discussed plans for an attack by  
/escorted

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- (1) They were: Air Marshal W.S. Douglas, C.B., M.C., D.F.C. (Fighter Command); Air Marshal Sir R.E.C. Pierse, K.C.B., D.S.O., A.F.C. (Bomber Command); and Air Marshal Sir P.B. Joubert de la Forté, K.C.B., C.M.G., D.S.O. (Coastal Command) Air Vice-Marshal T.L. Leigh-Mallory C.B., D.S.O., Commanding No. 11 Group, was also present with two of his staff.
- (2) An attack on a chemical works near Bethune two days before the meeting had been strenuously opposed by enemy fighters.

escorted bombers on an objective outside the normal fighter range, whose identity was not revealed in the written record of the meeting. (1)

S.46368/II,  
encl.89B.

7. The Air Staff did not dissent from the conclusions of the Commanders-in-Chief, and on July 8th outlined for their guidance a conception of the strategic situation created by the German attack on Russia which, though enriched by the experience gained since the campaign had actually begun, did not conflict in any important particular with that formulated on June 19th. The proposal to simulate preparations for a landing, however, was not pursued, for on consideration it was concluded that the enemy must be well aware of his ability to meet any threat of this kind with his existing garrisons. (2)

FC/S.24752,  
encl. 78B

iii. Effect on Offensive Plans of Fighter Command

8. This plan involved Fighter Command in the following obligations:
- (a) To continue and intensify, in conjunction with one or both of the other Commands, the "Circus" offensive, especially against the industrial area around Lille.
  - (b) To assist one or both of the other Commands in maintaining a constant offensive against enemy shipping in the Channel and the Straits of Dover.
  - (c) When practicable, to assist one or both of the other Commands in occasional attacks on what were called "fringe targets"; that is, objectives chosen for their own sake, without regard  
/to

C.O.S.(41)  
314th Mtg.

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- (1) This was, presumably, the group of power stations at Cologne, attacked in August ("Operation 77") (see para.88, below).
- (2) This idea was revived later in the year but was rejected by the Chiefs of Staff Committee on September,8th.

to the tactical requirements of an accompanying fighter force. This would include the operations hitherto known as "Blot".

9. It was not suggested that any of the existing commitments of the Command should cease, and to these classes of daylight offensive operation must be added two more, namely:

(d) Fighter sweeps without bombers.

(e) Operation "Rhubarb"

10. It will be convenient to deal with each of these classes in turn.

Operation "Circus"

i. Policy and Operations, 14th June to 29th July, 1941<sup>(1)</sup>

11. On June 14th an improvement in the weather permitted the resumption of major operations after a lapse of some three weeks, and "Circus XII", which had been planned as long ago as May 27th, was put into effect. This was an operation on familiar lines, in which twelve Blenheim bombers of No.2 Group, with an escort wing of three squadrons, attacked two aerodromes at St.Omer from 12,500 feet. The other five squadrons of fighters which were involved carried out three separate but co-ordinated patrols, the squadrons in turn being sub-divided into tactical formations each consisting of four aircraft. This tactic was judged successful, inasmuch as all the fighters returned safely, claiming the destruction of three enemy aircraft.

12. Another operation on normal lines ("Circus XIV") followed on June 16th. The objective this time was the gasworks at Boulogne, and again some of the fighters flew

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(1) This Section should be read in conjunction with Appendix (V)A, in which all "Circus" operations from June 14th to December 31st, 1941 are listed.

Report 11G/S.  
500/13/3/Ops.  
d. 16.6.41

Report 11G/S.  
500/13/3/Ops.  
d. 19.6.41

in "fours". The operation was marred, in the opinion of the fighter force, by the late arrival of the bombers at the rendezvous and by their splitting up over the target to make individual attacks.<sup>(1)</sup> Two Blenheims failed to return. Nevertheless the destruction of eleven enemy aircraft was claimed for the loss of three of our fighter pilots. From this point of view "Circus XIV" appeared therefore, by far the most successful "Circus" operation recorded up to this time.

Report IIG/S.  
500 3/3/Ops.  
d. 21.6.41

13. It was followed on the next day by "Circus XIII", which was originally to have taken place some hours after "Circus XII", but had been twice postponed. This was the most ambitious single "Circus" mission yet projected, since it involved taking a bomber force as large as that employed in "Circus X" to approximately the same area some 40 or 50 miles from the French coast; while the fighter force involved was larger, amounting to 22 squadrons. This force was made up of an escort wing; a high cover wing; a "main fighter force" in three echelons, two of which patrolled off the French coast as the bombers and their escort returned, while the third made a sweep over north-east France; and two "support-wings" which remained on this side of the Channel. It was noticed that the enemy fighter force reacted very promptly and energetically to this attack; and as it had also offered fairly substantial opposition to "Circus X", the conclusion was drawn that the enemy was particularly sensitive to any threat to the industrial area in which these two objectives lay. The operation resulted in claims to the destruction of fifteen enemy aircraft and the loss of nine pilots.

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/14.

(1) It was alleged that they arrived 15 minutes late. Their loss of formation over the target was probably due to A.A. fire.

14. The conclusion drawn from "Circus X" and "Circus XIII" had an important effect on the shaping of the offensive during the next four months.<sup>(1)</sup> Whether the Germans really were especially anxious to defend the area round Lille, as opposed to any other part of occupied France, is hard to establish;<sup>(2)</sup> what seems clear enough is that, if they had not made up their minds at an earlier stage to offer serious opposition to the offensive, they did so now. It was now that our fighters began to meet the enemy in large numbers and that the long-awaited fighter-battle came about.

15. On June 27th the Air Staff, having been informed of the conclusions reached by the Commanders-in-Chief on the 19th, sent to Bomber and Fighter Commands a list of "targets in Northern France suitable for attack in daylight with fighter cover". This superseded an earlier list. The targets comprised four railway centres (at Hazebrouck, Amentières, Lille and Abbeville) serving the principal Channel ports between Dunkirk and Le Touquet; and eight power stations, all within a 25-mile radius of Lille and serving industrial undertakings in that area. A ninth target of the second class was added at the beginning of August. The Air Staff pointed out that, apart from serving the Channel ports, the railway centres listed handled a considerable portion of the goods traffic emanating from the Lille industrial area, and that the eight power stations provided about 47 per cent of the total supply of electric power available "in the Pas de Calais".

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(1) See para. 4, above.

(2) Adolf Galland, at that time commanding J.G.26 (the sole fighter Geschwader in the Pas de Calais) and from December 1941 to February 1945 responsible as General der Jagdflieger for supervising the day fighter arm in all theatres, has suggested that the decision to offer serious opposition to the British offensive was taken because damage had been done to "railroads, airfields and industrial targets".

FC/S.24752,  
encl. 14A

Ibid.  
encl. 86A

Calais area".<sup>(1)</sup> They recorded the opinion that, if heavy damage were done to these twelve objectives, a very material effect on the whole industrial area would result.

16. It was arranged that No. 2 Group, in conjunction with Fighter Command, should carry out the offensive against these twelve targets, or such other objectives in the Pas de Calais-Lille area as the Air Officer Commanding might select in consultation with the Air Officer Commanding No.11 Group. As a secondary task, No.2 Group were to attack shipping and "fringe targets".

Ibid.  
encl. 18A

17. On July 3rd the Air Staff added to the list six industrial establishments known to be working for the Germans.<sup>(2)</sup> They expressed the view that attacking these targets was likely to lead to unrest among French workers which would embarrass the Germans and might even develop into a revolt. The French workers had already been warned by leaflets dropped from aircraft to keep away from factories working for the Germans. These six objectives were to take precedence over the twelve already listed.

Ibid.  
encl. 20A

18. On the same date the Air Staff announced the abandonment of the formula defining the aim of operation "Circus" which had been achieved with some pains in February.<sup>(3)</sup> The primary aim of the operation was now to be "the destruction of certain important targets by day bombing, and incidentally, the destruction of enemy fighter aircraft". The tactical limitations of our fighters were to be taken into account, but in future

Ibid.  
encl.21A

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(1) The significance of this if literally understood, is not clear, since the industrial area at which the attack was aimed lies mainly outside the Pas de Calais, in the adjacent department of the Nord. "Pas de Calais area" seems to have been used here, as elsewhere, to denote both departments collectively.

(2) A seventh was added in September.

(3) See Part IV, paras, 69-75.

targets were to be selected for their value as bomber objectives and the fighters were to see that the bombers had every opportunity to bomb them as effectively as possible.

19. On paper, this was an important change. In practice, the new directive did little more than regularise the existing situation. The tactical limitations of the fighters had already been taken into account in selecting the area against which the offensive was to be directed, and if penetration as far as St. Omer was thought too deep in February, <sup>(1)</sup> "Circus X" and "Circus XIII" showed that in June Béthune was not regarded as unacceptably distant, even under the old definition. Theoretically, the aims of operation "Circus" and of the operation hitherto known as "Blot" now became almost indistinguishable. In practice the distinction seems to have been well understood; and no revolutionary alteration in the methods of planning and executing "Circus" missions was required. One important change that did occur, however, was the transfer of the primary responsibility for providing the bomber force for operation "Circus" from No.2 Group, with its Blenheims, to No.3 Group, which was instructed on July 4th and 5th to give priority over its other commitments to the provision of Stirling bombers for this purpose, up to a maximum of eight sorties a day. The primary role of No.2 Group in respect of the daylight offensive now became the attack of shipping and "fringe targets", but as a secondary task Blenheims were to be provided for operation "Circus" if required.

20. Meanwhile the operation was continuing on the increased scale called for. Blenheims of No.2 Group /attacked

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(1) See Part IV, para. 68.

Ibid.  
encl. 29A

Ibid.  
encl. 42A

Report 11G/S.  
500/13/3/Ops.  
d. 25.6.41.

attacked a hutted camp near Calais on June 18th and aerodromes at St. Omer on June 21st. In the second of these operations new tactics were tried. It had been noticed that the enemy was showing an increasing tendency to press home his attack on the bombers, and it was therefore accepted as axiomatic that during the critical stages of the operation the maximum concentration of enemy fighters was likely to be found over the objective and along the route by which the bombers withdrew. On this assumption, two wings of three squadrons each (called "target support" wings) were sent to converge from both flanks on the target area about five minutes before the arrival of the bombers and their escort, with the object of establishing local air superiority during the bombing and the withdrawal stage. Other wings (known as "forward support" and "rear support" wings) patrolled at various heights off the French coast and in mid-Channel to engage any enemy fighters that might follow the bombers over the sea.

21. To all appearances these tactics were outstandingly successful. Local superiority was duly established, and the fighter force claimed the destruction of twelve enemy aircraft for no loss. The bombers accomplished their mission and, except for one aircraft which lagged behind the rest, perhaps with engine trouble, and was shot down, also emerged without loss. Similar tactics were used in subsequent operations, again with very good results so far as could be seen. In the seventeen operations executed between June 21st and July 4th, the fighter force claimed the destruction of 168 enemy aircraft and lost 40 pilots. For a time it seemed that something like complete ascendancy had been gained over the opposing fighter force, which, after furnishing determined /opposition

Reports 11G/  
S.500/13/3/  
Ops., various  
dates.

opposition to the bombers and their escort for a few days in the middle of June, now seemed reluctant to engage unless especially favoured by circumstances.

22.

Report 11G/  
S.500/13/3/  
Ops.

On July 5th Stirlings of No.3 Group were used in these operations for the first time. In "Circus XXXIII" three of them attacked an industrial target at Lille and one, as a diversion, the marshalling yard at Abbeville. This operation produced no major fighter battle, and only two enemy fighters were claimed as destroyed for the loss of two of our pilots. Stirlings were used as the main striking force in all but one of the "Circus" operations carried out during the next fortnight, but at the end of the third week in July, in consequence of the increasing importance attached by Bomber Command to the bombing of objectives in Germany itself by night, they ceased to be employed for this purpose; and for the "Circus" operations carried out between July 22nd and the end of the month, Blenheims of No.2 Group and of No.15 Group, Coastal Command, supplied the striking force.

23.

During this period, from July 5th onwards, the results claimed by the fighter force were not quite so good. Between June 14th and July 4th, 21 operations resulted in claims to the destruction of 207 enemy aircraft and the loss of 67 pilots. It was not to be supposed, however, that this falling off was attributable wholly to the introduction of the Stirlings or the decision that successful bombing must be the primary aim of the operation. True, in their first few operations the tactical methods used by the Stirlings were said to be less acceptable to the fighter force than those practised by the Blenheims;

/but

H.Q.F.C.  
Forms "Y",  
etc.

FC/S.21552,  
encl.129A

Ibid.  
encl.138B

but this was doubtless due to inexperience, since the Air Officer Commanding No.11 Group later expressed his preference for a small formation of heavy bombers rather than a large formation of Blenheims. Whatever the effect of these factors, it seemed as if one cause of the apparent decline was the improvement in the enemy's technical organisation and tactics which had doubtless occurred as the offensive gathered weight.

ii. Summary of Results, 14th June to 31st July, 1941 and Conference held on 29th July.

C.S.9419,  
passim

24. Towards the end of July the Air Staff decided to review the results achieved since the beginning of the intensive period, at a meeting summoned for July 29th.

H.Q.F.C.,  
Forms "Y".  
etc.

25. The last "Circus" in the month was on July 24th. Up to this point 46 of these operations had been carried out since June 14th. One hundred and twenty-three Fighter pilots had been lost, and it was claimed that 322 enemy aircraft had been destroyed. According to the claims made by our pilots and assessed by an Intelligence Officer at Headquarters, Fighter Command, these losses had been inflicted on the enemy at the rate of four aircraft for every one of our pilots lost during the second half of June, and two for every one of our pilots lost during July. Escort and cover had been provided for 374 bomber sorties<sup>(1)</sup> and some 8,000 fighter sorties had been flown. Various expedients had been tried in order to improve the tactical position of the fighter force or give the bomber force a clearer passage. On two occasions diversions had been made by single bombers equipped with a device ("broad I.F.F.") designed to produce on the enemy's radar equipment the impression of a large force. The effect of the bombing was /difficult

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(1) This figure includes sorties by bombers which failed to meet their escort or for other reasons turned back without accomplishing their task.

difficult to estimate; but more or less successful attacks had been made on a number of the objectives whose importance had been stressed by the Air Ministry and their advisors at the Ministry of Economic Warfare. Fifteen bombers had been lost, including one which crash-landed without injury to its crew.

26. These were remarkable figures. According to the information available to the Air Staff at the time, the operational strength of the German first-line single-engined fighter force deployed between the Franco-Belgian frontier and Brittany at the beginning of the Russian campaign had amounted to some 300 aircraft. By the end of July withdrawals to the eastern front had reduced this figure to less than 200. Information received since the end of the European War suggests that these withdrawals really occurred earlier; it would seem that the force left when the intensive period began did not exceed two Geschwader, which generally had some 160 to 200 serviceable aircraft between them, and whose actual strength was in the neighbourhood of 200 to 250 aircraft. In either case, if the claims of our fighter pilots were even approximately accurate, in six weeks at least as many fighter aircraft had been destroyed as the number that the opposing fighter force had possessed at the beginning of that period.

27. But were they accurate? At the end of July the German fighter force was still able to take the air although it had not been reinforced, so far as was known, by the arrival of any fresh first-line units from elsewhere. <sup>(1)</sup> Could it possible have done this if it had really  
<sup>(1)</sup> German records show that this belief was substantially correct. Quasi First-line units, in the form of reserve training units, had, however, been brought into the line.

S.46368/II,  
encl. 89C

FC/S.24752,  
encl. 78B

C.S. 9419,  
minutes 10;  
A.I. 1(k)  
Report No.  
398/1941

really suffered losses of this order? A prisoner of war captured on July 10th<sup>(1)</sup> maintained that it could not: he said that the Luftwaffe would have been quite unable to make good such high wastage. He drew the conclusion that we were not, in fact, inflicting the casualties we claimed. He also expressed satisfaction at our having gone over to the offensive, and added that his compatriots were not seriously worried by the bombs that we were dropping on French soil.

C.S. 9419,  
mins. 10 - 13

28. This prisoner's statement, taken in conjunction with a report that, at a time when we were doing our best to induce the Germans to move aircraft from east to west, they were actually moving them in the other direction,<sup>(2)</sup> made a considerable impression and contributed largely to the decision that a conference should be held on July 29th to review the situation.

A.D.I. (K)  
Report No.  
373/1945,  
paras. 158-178

29. Since the end of the war new light has been thrown on this question. First, there is the testimony of a German officer, Adolf Galland, who then and subsequently was, perhaps, better placed than anyone else to assess the situation from the German point of view. This officer has said that in the Spring of 1941 the two single-engined fighter Geschwader in northern France had from 160 to 200 serviceable aircraft between them. When the eastern campaign opened, these two Geschwader were left to shoulder the burden of resisting our daylight offensive. The next few weeks imposed a strain greater than that experienced /during

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(1) Hauptmann Rolf Peter Pingel, Gruppenkommandeur of I/J.G. 26.

(2) It was reported in July that I/ and II/K.G. 4., II/K.G. 26 and III/K.G. 28 had moved from the western to the eastern front between June 19th and 21st. These were bomber and not fighter units, but they represented a substantial slice of the estimated German strength left in the west, and the news was disquieting.

Records of 6th  
Abteilung  
(Q.M. G.),  
German Air  
Ministry

during the battle of Britain; but morale remained good, because most of the fighting was over France, and pilots who baled out had every chance of landing safely. Nevertheless, German losses were heavy, and in August the number of serviceable aircraft in the two Geschwader fell to about 90. Pilots received as replacements proved disappointing in quality and it was necessary to leaven the lump by calling back some experienced pilots from the eastern front. Secondly, we have the records of the German Air Ministry, which show that, although during these six weeks from the middle of June to the end of July we really destroyed 81 German fighters in all classes of daylight offensive operations, and not 355 as we supposed, the strength of the two Geschwader did in fact fall from 193 on June 28th to 140 on August 23rd, and the number of serviceable aircraft from 140 on the first of those dates to 97 on the second. (1)

30. However; this evidence was not, of course, available at the conference held on July 29th. All that was known then was that, although enormous losses were alleged to have been inflicted on the Germans, the offensive seemed to have failed to induce them to move any flying units from east to west. It was known that the reserve training units had been called upon to replace losses, and thought possible that additional quasi-first-line units had been formed from this material. (2) The impression derived from the fighting was that during the second half of June the German fighter force had, for the first time, offered

(1) For details, see appendix (V) G. /determined

(2) Hauptmann Pingel (see footnote to para.27) said definitely that "independent first-line units" had been formed in this way.

determined resistance to the offensive, and in consequence had suffered losses which had caused it to revert, at the beginning of July, to its former more cautious tactics. About a week later it seemed that reinforcements had arrived but that they were of poor quality, for although the enemy began to appear in strength again, he showed little fight. During the last half of the month, however, resistance had stiffened and it was suspected, though not established, that some experienced pilots had arrived from the eastern front.

C.S.9419,  
encl. 4A

31. On the other side of the scale, our own losses had been investigated in the middle of July. It was found that the losses of Fighter Command in pilots killed, wounded and missing during each of the first two weeks of the intensive period were less than half the number killed and missing in an average week in the previous September, when the battle of Britain was being fought. Our losses in fighter aircraft during this period had not exceeded our capacity to provide replacements.

Ibid.,  
encl. 5A

Ibid.,  
encl. 7A

32. On July 24th, however, Bomber Command had suffered rather heavy losses in a daylight operation directed against German capital ships at Brest and La Pallice.<sup>(1)</sup> Although little fighter opposition had been expected and the fighters covering the attacks saw few enemy aircraft, sixteen bombers out of 149 detailed and 115 despatched did not return, and it was believed that most of them had been shot down by fighters after falling out of formation, possibly because they had been hit first by fire from the ground. Others had been badly damaged and their crews had suffered casualties.

FC/S.24752,  
encl.78B;B.C.  
Summary of Ops.  
No.151; B.C.  
Note D.1738(a)  
d. 28.7.41.  
H.Q.F.C.  
Form "Y".etc.

/33.

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(1) See para.63, below. There was also a small (unescorted) operation against La Pallice on July 23rd, in which one Stirling was lost out of six despatched.

FC/S.24752,  
encl. 78B

33. In the light of this experience, the Air Officer Commanding-in-Chief, Bomber Command considered that the strategical conception which had been formulated by the Commanders-in-Chief on June 19th and elaborated in the Air Staff's memorandum of July 8th was unsound. He believed that he and his colleagues had been too sanguine when they hoped that operation "Circus" and its concomitants would open a backdoor into Germany for daylight bombing. He now felt that daylight bombing of Germany on any considerable scale was impracticable with his present resources and that the best results were likely to come from the activities of Fighter Command over northern France. He would continue to do his best to bomb Germany in daylight when circumstances were favourable, but he believed that the best help his Command could give to the Russians would lie in bombing Germany in the most economical manner possible.

34. Although he did not explicitly say so, this implied that the daylight bombing effort of Bomber Command in good weather ought in his opinion to be reduced, or at any rate not increased, in order that the maximum weight of bombs should be dropped on Germany at night and in cloudy weather.

35. In reply, the Air Officer Commanding-in-Chief, Fighter Command pointed out that his fighters could not hope to bring the enemy to battle on an adequate scale without the co-operation of a bomber force. The Chief of the Air Staff agreed. It was therefore decided that "Circus" operations should continue; the striking force would be provided by Blenheims, supplemented if possible by a few Stirlings. Meanwhile Fortresses and any other  
/heavy

heavy bombers that could be made available should be used for attacking thickly-populated areas in Germany or Italy. In this way the Germans might still be forced to remove fighters from the eastern front in order to give increased protection to Germany. For the medium and heavy bombers other than Fortresses, night operations would normally take precedence over daylight operations.

iii. Policy and Operations in August, 1941

H.Q.F.C.  
Forms "Y" etc.

36. "Circus" operations were therefore resumed on August 5th and continued at the average rate of one a day throughout the month. In practice it was not found possible to provide any Stirlings for the purpose; and Blenheims of No.2 Group formed the striking force for 24 of the 26 operations carried out in August. On August 12th Hampdens of No.5 Group formed the striking force for two "Circus" operations which were executed as diversions in connection with a daylight attack by Bomber Command on targets at Cologne.

37. The apparent improvement in the quality of the opposing fighter force which had been noticed during the second half of July was maintained. In August 72 of our pilots were lost, while claims to the destruction of enemy aircraft amounted to 100. It seemed that a battle in whose early stages we had claimed the destruction of four enemy aircraft for every one of our pilots lost was now tending towards numerical equality. Since some of the enemy pilots whose aircraft we claimed to have destroyed must be presumed to have landed safely by parachute, it was thought possible that our losses over this period were greater than the enemy's. We now know, of course, that this was so.

FC/S.24752,  
encl. 100A.

38. On August 28th the Air Officer Commanding-in-Chief, Fighter Command wrote semi-officially to Sir Wilfrid Freeman, the Vice-Chief of the Air Staff, drawing attention to this situation and asking for his views regarding the continuance of the offensive. What he had in mind was that at some future time the intensity of the fighting on the eastern front might perhaps grow less. Until that time it would presumably be necessary to continue the intensive "Circus" programme. But if a respite in the east did come, would he and his colleague at Bomber Command be justified in reducing the weight of their offensive? And when, if at all, was this respite to be expected?

iv. Policy and Operations in September and October, 1941

C.O.S.(41)  
302nd. Mtg.

39. At their meeting on the same day the Chiefs of Staff discussed this question of losses in daylight operations and invited the Chief of the Air Staff to circulate a paper on the subject.

C.S.9419, encl.  
17A and 18A;  
FC/S.21552,  
encl.154B;  
J.O.S.(41)  
574 (Draft)

40. In consequence the Air Staff drew up a memorandum dealing with several aspects of the offensive from January to the end of August. They pointed out that bombing done in "Circus" operations during the intensive phase had inflicted substantial damage, notably to the power stations at Comines and Chocques and the shipyard at Le Trait. Although the offensive had not succeeded (so far as was known) in forcing the Germans to bring back any fighter units from the eastern front, it was thought that it had affected the flow of replacement personnel to that front and prevented the enemy from reinforcing weak parts of his line or moving units to Sicily, where they were badly needed for convoy protection. Noting that the offensive against occupied territory was becoming less  
/profitable

C.O.S. (41)  
574

profitable from the fighter aspect, the Air Staff concluded that it should be continued on a reduced scale for the sake of a number of subsidiary advantages which it conferred, but that it was not likely to cause the enemy to bring back fighters from the eastern front. Presenting a condensed version of this memorandum to the Chiefs of Staff Committee, the Chief of the Air Staff pointed out that the decline in the weather now to be expected was another reason for reducing the scale of attack.

C/S. 21552,  
encl. 138B

41. This gave the answer to one, at least, of the questions asked by the Air Officer Commanding-in-Chief, Fighter Command in his semi-official letter. In the meantime the Air Officer Commanding No. 11 Group had also written a memorandum on the subject of operation "Circus". He, too, recommended that the offensive be continued but that its intensity be reduced in future by taking advantage only of the most favourable weather. He pointed out that the biggest losses had mostly been incurred on days when cloud or haze had helped the enemy to pounce on stragglers. He also recommended that continued attacks be made on objectives near Rouen and Le Havre so as to induce the enemy to spread his fighters more thinly along the French coast instead of concentrating most of them between Belgium and the Somme. Air Vice-Marshal Evill, Senior Air Staff Officer at Headquarters, Fighter Command, endorsed these proposals and suggested that it would be advisable to go further and spread the offensive against a variety of targets "from the Texel to Brest".

FC/S. 21552  
encl. 144A

42. In forwarding his subordinate's memorandum to the Air Ministry on September 12th with an expression of his general approval, the Air Officer Commanding-in-Chief, Fighter Command announced that he proposed

/"to

"to scale down the offensive effort  
"slightly in the Pas de Calais area and  
"instead to undertake rather more wide-  
"spread attacks against suitable fringe  
"targets on the broader front between  
"Texel and Brest".

43.

A similar communication was made on September 14th to the Groups concerned.

Ibid.,  
encl. 151A.

44.

Whether as a result of this decision or as an automatic consequence of a deterioration in the weather, the number of "Circus" operations carried out in September was reduced to twelve. They resulted in the loss of 49 pilots and claims to the destruction of 83 enemy aircraft. Two more operations were carried out during the first week in October; neither was very successful and together they resulted in claims to the destruction of six enemy aircraft for the loss of the same number of pilots. At this point the Air Officer Commanding-in-Chief, Fighter Command felt that the Air Officer Commanding No.11 Group was not fully aware of the desirability of reducing the "Circus" effort, and he wrote semi-officially to his subordinate on October 7th, inviting him to "turn his mind away to some extent from 'Circus' operations" and pay more attention during the next few months to operation "Rhubarb" and to night fighting. He observed that the Command would be desperately short of fighters for the next six months. (1) so that it could not afford heavy losses however large the gains; and that during the next few weeks the situation in Russia would be decided one way or the other until the Spring in a manner which would be little affected by anything the Command might do.

H.Q. F.C.,  
Forms "Y"  
etc.

FC/S.21552,  
encl. 165A

/Formal

(1) Because of demands from other theatres.

FC/S.21552,  
encl. 169A

Ibid.  
encl. 169A

Ibid.  
encl. 175A

H.Q. F.C.  
Forms "Y",  
etc.

F.C.I.S.  
No.285, d.  
17.10.41

Ante, para.44

H.Q.F.C.  
Forms "Y" etc.

C.S.9419,  
encl.21A,21B,  
22A.

H.Q.F.C.,  
Forms "Y" etc.

Formal directions in this sense, addressed to the three Groups concerned, followed on October 12th. A further instruction issued on October 21st limited No.11 Group to six "Circuses" a month.

45. During October there were five "Circus" operations which resulted in claims to the destruction of 31 enemy aircraft and the loss of nineteen pilots. These outwardly satisfactory figures were largely due to one apparently very successful operation on October 13th, when the enemy appeared in large numbers and the destruction of sixteen enemy fighters was claimed for the loss of eight pilots. Our pilots reported that the enemy fighters seen included aircraft of a new type which had also been seen on September 27th. This proved to be the F.W.190, with which the German fighter unit II/J.G. 26 is now reported to have been re-armed in September. When first encountered this aircraft did not seem unduly formidable.

v. Policy and Operations in November and December, 1941

46. With respect to policy, the position at the beginning of November was that No.11 Group was limited to six operations a month.

47. In practice there was only one "Circus" operation in November. This was on November 8th and was carried out in conjunction with a fighter sweep and a low-level attack by fighters and fighter-bombers on an alcohol distillation plant. In consequence of errors in navigation and timing, accentuated by a high wind, the "Circus" resulted in the loss of eight pilots and claims to the destruction of four enemy aircraft; in the attack on the alcohol plant five more pilots were lost and the destruction of one more enemy aircraft was claimed. Later in the day another pilot was lost in the course of a sweep over the Channel Islands.

/Thus

Thus the whole day's offensive operations resulted in claims to the destruction of five enemy aircraft and the loss of fourteen pilots,<sup>(1)</sup>

48. These losses and also those incurred in Bomber Command's operations on the night November 7/8th,<sup>(2)</sup> which included a raid on Berlin, were discussed by the War Cabinet on November 11th. The conclusion reached was that, while the offensive should not be discontinued, some conservation of resources was desirable in order that a strong force should be available in the coming Spring. The Air Officers Commanding-in-Chief, Bomber and Fighter Commands were therefore warned that attacks should not be pressed too hard when the weather or other circumstances were unfavourable to our aircraft.

49. To some extent Air Marshal Douglas had anticipated this decision by limiting No. 11 Group, on November 10th, to three "Circus" operations a month instead of six. He now went further, by asking the Air Officer Commanding No. 11 Group not to carry out any more such operations except after consultation with himself. An official letter to Nos. 10, 11 and 12 Groups, giving the gist of the communication received from the Air Ministry in consequence of the War Cabinet's decision, was despatched on the same day (November 15th).

50. The outbreak of war between the United States of American and Japan a month later provided further reasons for conservation. In a letter to Fighter  
/Command

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(1) These were the claims and losses as finally assessed by H.Q.F.C. On the day itself only four enemy aircraft were claimed as destroyed, but one of those claimed as probably destroyed was eventually considered to have been destroyed.

(2) Bomber Command despatched 400 aircraft, of which 37 were lost. This was the largest force of bombers despatched on a single night up to that date.

C.M.S. 868,  
encl.  
d. 12.11.41;  
FC/S. 26678,  
encl. 1A, 2A.

FC/S. 21552,  
encl. 180A.

FC/S. 26678,  
encl. 6A

Ibid.  
encl. 7A

Ibid.  
encl. 8A.

C.M.S. 868,  
encl. d. 12.11.41;  
C.O.S. (41) 680

Command, dated December 10th, the Air Staff pointed out that the consequence of this event might well include a reduction in the supply of aircraft from America and an increased demand from Russia for aircraft to make good a parallel reduction in that quarter. Consequently, the adoption of a more defensive policy was now a disagreeable necessity. At long intervals large-scale operations against important objectives might still be undertaken, but the constant drain imposed by minor operations of no more than nuisance value must be avoided.

51. The Fighter Groups concerned had already been informed of the necessity for strict economy, but when writing semi-officially to the Air Officer Commanding No. 11 Group on December 23rd to suggest occasional fighter sweeps as feints to keep the enemy on the alert, the Air Officer Commanding-in-Chief took the opportunity of reminding him that all operations which might prove expensive must be avoided.

Ibid. mins  
9 and 10

Ibid.  
encl. 17A

52. In practice no more "Circus" operations were carried out in 1941.

H.Q.F.C.  
Forms "Y" etc.

The Offensive against Shipping.  
i. Policy and Operations, 14th June to 15th July, 1941.

53. It will be remembered that one of the decisions made at the meeting of the Commanders-in-Chief on June 19th was to recommend that intensive attacks be made on shipping passing through the Straits of Dover. It was hoped that these, in conjunction with night attacks on communications in the Ruhr, would constitute so grave a threat to communications between Germany and France that the enemy would be forced to bring back fighters from the east to meet it. There was the further point that if intensive attacks were made on shipping passing through the Straits of Dover in daylight, the enemy would probably

FC/S. 24752,  
encl. 5B

/start

start to pass this traffic at night. This would provide favourable opportunities for offensive action by surface craft of the Royal Navy.

54. An offensive by escorted bombers against enemy shipping in the Straits of Dover or the Channel was, of course, by no means a new thing. There had been occasional operations of this kind in 1940; and between February and the middle of June, 1941, fourteen "Roadstead" operations against naval craft and merchant shipping between Flushing and the Somme had been carried out. As early as April 24th, the Air Officer Commanding No.2 Group had announced that his Group was attempting, with the assistance of No.11 Group, to "put a stop on the Channel", and that since this attempt began on March 12th, over 200,000 gross tons of enemy shipping had been molested and some 75,000 tons of it either sunk or severely damaged.

55. What was now proposed was an intensification of this offensive. It was agreed at the meeting on June 19th that in future the striking force should be provided by Coastal Command, which would base one or more squadrons of Blenheims at Detling and a squadron of torpedo bombers at Thorney Island for the purpose. To supplement this force, Blenheims of No.2 Group might still be used in that part of the Channel lying between Le Tourquet and Cherbourg, and it was intended that they should also operate between Dunkirk and The Hague. The Straits of Dover from Le Touquet to Dunkirk and the Channel west of Cherbourg would be reserved for Coastal Command. Pilots of Fighter Command, and particularly those of Nos. 91 and 601 Squadrons, would continue to supplement by visual reconnaissance the intelligence

/about

Part IV,  
paras. 67-112,  
passim.

FC/S.20787,  
encl. 66A

FC/S.24752,  
encl. 5B

Ibid.,  
encl. 39A

about the movements of enemy shipping obtained from the usual naval and air sources.

Ibid.  
encl. 47B

56. These proposals represented a compromise between the views of Coastal Command, who considered that all air operations against shipping should be primarily their responsibility, and of Bomber Command, who thought that the primary responsibility for all bombing operations, whether on land or at sea, ought really to be theirs. On July 15th, a meeting was held at the Air Ministry for the purpose of defining the respective responsibilities of the two Commands in a more authoritative manner. The Chief of the Air Staff presided. At this meeting it was agreed that a trial should be given to the system of dividing responsibility by areas, but the division originally proposed was not adopted. Instead it was now decided that Bomber Command should be primarily responsible for anti-shipping operations (including reconnaissance) between Cherbourg and the Texel, (2) and Coastal Command bear the primary responsibility elsewhere. This would not debar the torpedo-carrying aircraft of Coastal Command from operating over, say the Straits of Dover, but if they were so used they would come under the temporary control of Bomber Command. Conversely, if aircraft of Bomber Command were used against shipping anywhere except between Cherbourg and the Texel, Coastal Command would assume temporary control of them.

Ibid.

57. It was also agreed that an attempt ought to be made to put a complete stop on the movement of enemy shipping through the Straits of Dover and that a "fire brigade" of two No.2 Group squadrons - to be assisted for a limited period by one Coastal Command squadron - should be /stationed

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(1) These paragraphs should be read in conjunction with appendix (V)B.

(2) Later amended to Wilhelmshaven.

stationed in south-east England for the purpose. Assistance to be provided by Fighter Command would include preliminary low-level attacks on the decks of ships for the purpose of minimising anti-aircraft fire. (1)

58. At the date of this meeting, ten operations of the "Roadstead" type against shipping between Ostend and Cherbourg had been carried out since June 14th. From one to three squadrons of fighters had taken part in each operation. In addition, Nos. 91 and 601 Squadrons had carried out a considerable volume of visual reconnaissance and escort had been given on some half-dozen occasions to single Blenheims on the look-out for shipping to attack. (2)
- ii. Policy and Operations, 16th to 31st July, 1941

59. Formal directions to the Commanders-in-Chief to begin operations in accordance with the decisions made on July 15th were issued three days later, and by July 19th the new arrangements were complete. In future there would always be one flight of No.2 Group Blenheims at Manston ready to take off within about 30 minutes and another squadron standing by to operate at one hour's notice. No.11 Group would keep one squadron ready to provide close escort. Executive orders would be issued by an officer from No.2 Group, known as the Bomber Controller, who would act from the headquarters of No.11 Group and in consultation with the No.11 Group Controller. (3)

It was laid down that part of the close escort squadron /should

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- (1) It will be remembered that in "Circus I" on January 10th "Flak ships" had been silenced by such methods.
- (2) Reconnaissance flights, whether by bombers or fighters, have not been included in the schedules of offensive operations appended to this volume except when casualties were claimed or suffered by fighters in the course of them.
- (3) Originally he was to have been located at Headquarters, No.16 Group, but this was changed.

H.Q.F.C.  
Forms "Y",  
etc.

FC/S.24752,  
encl. 54A

Ibid., encl.  
56A

Ibid., encl.  
58B

should be detailed to attack ships carrying anti-aircraft guns.

H.Q.F.C.  
Forms "Y", etc.

FC/S.24752,  
encl.71A,78B

60. During the second half of July operations of the "Roadstead" type were carried out at the rate of about one a day. The size of the fighter force involved in each operation varied from one flight to five squadrons. The losses of the fighters were not serious, but in spite of their efforts to minimise anti-aircraft fire for the benefit of the bombers, the slow and ill-protected Blenheims suffered heavy casualties.

H.Q.F.C.  
Forms "Y", etc.

61. In addition to providing support for these "Roadstead" patrols and flying visual reconnaissance sorties, aircraft of Fighter Command made several attacks on shipping during the second half of July in the course of reconnaissance and "Rhubarb" patrols. Besides these a number of fighter sweeps were flown for the express purpose of attacking shipping, while on other occasions pilots were despatched on sweeps with orders to seek out and attack either shipping or enemy aircraft as opportunity might offer.

FC/S.24752,  
encl.71A,78B

62. The losses suffered by No.2 Group in "Roadstead" operations resulted first in pressure on Fighter Command to increase their efforts against "Flak Ships", and secondly in a request that the Hurricane bomber, which was then under development, should be included in the equipment of No.2 Group so that it would be used whenever possible instead of the Blenheim. The Chief of the Air Staff approved the proposal to use Hurricane bombers for this purpose but ruled that they should be operated by Fighter Command and not by Bomber Command, in order that full advantage might be taken of the existing Fighter Command control system.

HQ.F.C.  
Forms "Y" etc.

63. On July 24th fighter support was provided for an attack by Bomber Command on the German capital ships Scharnhorst, Gneisenau and Prinz Eugen at Brest and La Pallice. Fighters of No.11 Group escorted two formations of bombers on diversionary operations against Cherbourg and the equivalent of nine fighter squadrons of No.10 Group provided support over Brest and the Channel. From the fighter aspect the results were not unsatisfactory, since the destruction of five enemy aircraft was claimed for the loss of three pilots; but Bomber Command suffered serious losses, and this operation did much to convince the Air Officer Commanding-in-Chief that there was no immediate hope of undertaking daylight bombing operations against Germany on any substantial scale except at a prohibitive cost.<sup>(1)</sup> Support was also provided for an operation off Ushant on the following day.

iii. The Hurricane Bomber: Development Stage

64. The Hurricane bomber had now been under development for some time. This aircraft was the offspring of a scheme to "bomb the bomber", which had resulted in a single Hurricane being sent to the Aeroplane and Armament Experimental Establishment at Boscombe Down for flight tests with a load of two 250 lb. bombs. As early as April, 1941, the Director of Operational Requirements at the Air Ministry asked for the views of the Air Officer Commanding-in-Chief, Fighter Command, on the desirability of using aircraft modified to take this load for attacking targets on the ground.

FC/S.24738,  
encl. 1A

65. A few days later it was announced that tests  
/would

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(1) See also para.32 above.

Ibid.,  
encl. 2A

would be carried out on two Hurricanes modified so as to carry two 250 lb. or eight 40 lb. bombs. The Director of Fighter Operations suggested that the aircraft might prove a useful weapon against tanks or merchant vessels and that it might be used for "Intruder" operations.

Part IV  
para. 28.

FC/S. 24738,  
encl. 3A

Ibid.  
encl. 6A

66. At this time No. 11 Group had just expressed a desire to use fighters equipped with bombs for operation "Rhubarb". The Air Officer Commanding was therefore invited to say how he would employ Hurricanes so modified if he got them, and how many he could use. His answer was to propose that two existing Hurricane squadrons should be equipped as fighter-bombers and that they should be used for both "Circus" and "Rhubarb" operations.

Ibid.  
Minutes 4 to 11  
and encl. 10A

67. As a result of the foregoing and of further consideration given to the matter at his headquarters, the Air Officer Commanding-in-Chief, Fighter Command, came to the following conclusions:

(a) that it would be a waste of time to go on with trials of "bombing the bomber";

(b) that no definite recommendation respecting the re-equipment of any squadrons with the modified Hurricane could be made until further experience had been gained.

Ibid.  
encl. 10A

68. On May 26th, therefore, he asked that one or both of the experimental Hurricane bombers be allotted to the Air Fighting Development Unit for trial. Both were so allotted, and bombing trials carried out against stationary and moving targets led to the conclusion that the Hurricane bomber was likely to prove very suitable for level attacks on shipping, reasonably suitable for level attacks on armoured fighting vehicles, and possibly suitable for level attacks in operations of the "Circus" type and for dive-bombing. Handling was not affected by

Ibid.  
encl. 1A  
and 34B

/the

the presence of one or both bombs;<sup>(1)</sup> but the tests at Boscombe Down had already shown that the top speed of the aircraft at 16,000 feet was reduced by about five per cent, the range by about fifteen per cent, and the service ceiling by 2,500 feet.

69. Meanwhile, as an independent measure, tests with Hurricanes carrying four 20 lb. bombs each were being made in No.10 Group by No.87 Squadron on the initiative of the Squadron Commander, Squadron Leader I.R. Gleed, who wished to use these bombs against enemy aircraft dispersed on aerodromes in France. The results of these trials were communicated to the Air Fighting Development Unit.

Ibid.  
encl. 24A and B

70. By this time the potential value of the Hurricane bomber in relation to the "Channel Stop" was becoming plain, and both Bomber and Fighter Commands submitted claims to the aircraft. As has been seen, the views of Fighter Command prevailed, and it was decided that two fighter squadrons should be equipped with the modified aircraft.

Ibid.  
encl. 31A, 36A,  
FC/S. 24752,  
encl. 78B

iv. Policy and Operations, 1st August to 7th October, 1941

71. However, Hurricane bombers were not to become available for active operations until October. In the meantime, the task of attempting the "Channel Stop" continued to fall on the Blenheims of No.2 Group. As in the past, their efforts were supplemented from time to time by Beaufort torpedo-bombers of Coastal Command. Ten operations of the "Roadstead" type were carried out in August. In addition, Whirlwind fighters with an escort attacked tankers off Cherbourg on August 6th;<sup>(2)</sup> and on  
/two

Ibid.  
encl. 91A.  
etc.

H.Q.F.C.  
Forms "Y" etc.

- (1) This refers to the two 250 lb. bombs. The modification eventually adopted did not permit the alternative load to be carried.  
(2) This was No.10 Group's "Warhead 6". Twelve other patrols of this type were carried out in June, August and September, but the others were directed primarily against land objectives.

two or three occasions Beaufighters of Coastal Command escorted by fighters went out against small surface craft.

FC/S.24752,  
encl. 96B

72. Serious losses continued to be suffered by the Blenheims, and towards the end of August the Air Staff instructed Bomber Command that supplies of this aircraft must be conserved in order that the requirements of Malta and the Middle East Command, which were of primary importance might be met. No.2 Group were already maintaining two squadrons in Malta; their primary responsibilities after meeting this commitment were now to be, firstly, the "Circus" offensive and, secondly, the "Channel Stop". It might have been expected that this would mean that henceforth attacks on what were called "fringe targets" and on shipping outside the narrow waters of the Channel by aircraft of Bomber Command would be rare.<sup>(1)</sup> In practice the term "Channel Stop" was not interpreted so narrowly. Several attacks on shipping off the Dutch and Belgian coasts were made in September and altogether the number of "Roadstead" operations executed during the month amounted to thirteen - three more than in August.

H.Q.F.C.,  
Forms "Y"  
etc.

73. From September 29th to October 3rd the Blenheims of No.2 Group were needed for participation in Army manoeuvres and responsibility for the "Channel Stop" was transferred for this period to Coastal Command. In point of fact, no "Roadstead" patrols were executed between September 29th and October 9th.

H.Q.F.C.  
Forms "Y", etc.

74. Throughout August, September and the first week in October fighter sweeps with shipping as their first or secondary objective, and incidental attacks on shipping by fighters flying "Rhubarb" or reconnaissance sorties, were continued.

FC/S.20787,  
encl.93A to  
96A

<sup>(1)</sup> /v. The  
<sup>(2)</sup> Instructions to suspend attacks on "fringe targets" as primary objectives had been issued to No.2 Group about a week earlier, on August 20th.

v. The Hurricane Bomber and the "Channel Stop"

75. It was decided early in August that the two fighter squadrons to be equipped with the Hurricane modified to carry bombs should be No.312 (Czech) Squadron and No.402 (Canadian) Squadron, and that they should be located at Manston and Southend respectively. Later it was decided that No.607 Squadron should be substituted for No.312.

FC/S.24738,  
encl.43A,  
47A  
Ibid.  
encl. 55A

76. The first Hurricane bombers became available for delivery to squadrons late in September and by October 1st one flight of No.607 Squadron was equipped with these aircraft.

Ibid.  
minutes 76, 77;  
FC/S.20787,  
encl.98A

77. It had long been understood that when the Hurricane bomber came into active use, responsibility for the "Channel Stop" would be transferred from Bomber Command to Fighter Command.<sup>(1)</sup> Accordingly, at dawn on October 8th Fighter Command assumed responsibility for day operations against enemy shipping in the area between Manston, Ostend, Dieppe and Beachy Head. Outside this area responsibilities remained as defined in the middle of July. The effect on Bomber Command of this change, in conjunction with the decision to reduce the intensity of the "Circus" offensive made about this time, was that the primary task of No.2 Group, after the maintenance of two squadrons at Malta, was now to attack shipping, or alternatively "fringe targets", outside the "Channel Stop" area but between Wilhelmshaven and Cherbourg. "Circus" operations became only a secondary task.

FC/S.24752,  
encl. 126A  
129A

Ibid.  
encl.130A and  
next encl.  
(unnumbered)

vi. Policy and Operations, 8th October to 31st December, 1941

78. Fighter bombers of No.607 Squadron carried out their first "Roadstead" on October 30th, when four Hurricane /bombers

H.Q.F.C.  
Forms "Y", etc.

(1) Although not explicitly recorded in the minutes, this decision is said to have been taken at the meeting on July 29th at which it was decided that the Hurricane bombers should go to Fighter Command.

bombers escorted by seven Hurricanes of No.615 Squadron were despatched to attack four ships reported to be off Gravelines. They did not find the ships and jettisoned their bombs. The next fighter-bomber "Roadstead" was not until November 26th, when No.402 Squadron, which had now obtained its modified Hurricanes and was operating from Warmwell, in No.10 Group, sent four aircraft escorted by ten Spitfires of No.234 Squadron and with another ten Spitfires of No.501 Squadron as top cover to attack shipping reported to be off Cherbourg. Once again the ships were not found.

79. Ibid. No.607 Squadron were more successful on the following day, when they duly discovered the convoy off St. Valéry-en-Caux which they had been instructed to attack, and with the assistance of accompanying fighters claimed the destruction of a merchant vessel and two escort ships. One of the accompanying squadrons claimed the destruction of two enemy fighters. Later in the day No.607 Squadron attacked ships in harbour at Boulogne, and this time lost three Hurricane bombers and their pilots. Another "Roadstead" by No.607 Squadron on December 5th resulted in indeterminate damage to several ships, the loss of four pilots from the squadron and its accompanying fighters, and a claim to the destruction of one enemy aircraft.

Ibid. 80. There were no other "Roadsteads" by fighter-bombers in 1941. Blenheims and torpedo-bombers carried out eleven "Roadsteads" in October, one in November, and none thereafter. In December two daylight attacks directed against the warships at Brest (operations "Veracity" and "Veracity II") were made by heavy bombers of Bomber Command with fighter support provided by No.10 Group. Once again the results seemed satisfactory from the fighter aspect, the destruction of ten enemy aircraft being claimed for the /loss

loss of four pilots; but the bomber force suffered substantial losses.

81. Several fighter sweeps directed against shipping were made in October and early November and incidental attacks on shipping by fighters on "Rhubarb" and reconnaissance sorties continued to be made intermittently up to the end of the year.

Attacks on "Fringe Targets": Operations "Blot", "Gudgeon" and "Ramrod"

82. Originally the theoretical distinction between operation "Circus" and operation "Blot" was that in the one case objectives were chosen to suit the tactical requirements of the fighter force, and in the other because it was particularly desired to bomb them. A practical difference was that for "Circus" operations a large fighter force was usually employed, while in the attacks on "fringe targets" to which the code-name "Blot" was originally applied,<sup>(1)</sup> the fighter force was generally small, either because of practical limitations or because the intention was to safeguard the bombers rather than bring on a fighter battle.

83. With the re-definition of the aim of operation "Circus" which was made in July, this nominal difference almost disappeared. The practical difference remained. Destruction of the target was now the aim in every case. In "Circus" operations it was desired to bring on a fighter battle as well; in the other operations this additional aim was not present.

84. Between June 14th and December 31st one "Blot", five "Gudgeons", 21 "Ramrods" and three anonymous operations against fringe targets were carried out, in addition to a /fighter

(1) "Gudgeon" was originally the equivalent in No.10 Group of No.11 Group's "Blot". Later it was decided to use the name "Ramrod" throughout the Command.

fighter-supported attack on Cologne which was known as "Operation 77",<sup>(1)</sup> Besides these, several attacks on aerodromes and other objectives were made by Whirlwinds flying with an escort.<sup>(2)</sup>

85. The operation known as "Blot III", which took place on June 19th, was an attack on the docks at Le Havre which was to have been carried out by the comparatively large force of 36 Blenheims of No.2 Group, escorted and supported by seven squadrons of fighters. In practice haze and cloud prevented 27 of the bombers from completing their task. Only two enemy fighters were seen and no losses were incurred.

86. Of the five operations included in the "Gudgeon" series, one was directed against the aerodrome at Lannion and the rest against shipping in harbour at Le Havre or Cherbourg, or both. Between them these five operations resulted in claims to the destruction of seven enemy aircraft for the loss of two fighter pilots, so that they were of some apparent value apart from any damage done by the bombing.

87. The three operations to which no code-name was given consisted of attacks by Blenheims escorted by long-range Spitfires of No.10 Group, sent to No.12 Group for the purpose, on the aerodrome at Bergen/Alkmaar and steel works at Ijmuiden respectively; and an attack on the docks at Rotterdam by Blenheims escorted by long-range Spitfires /of

H.Q.F.C.  
Forms "Y", etc.

H.Q.F.C. Forms  
"Y" etc;  
Report 10G/S.  
8265/1/Ops. d.  
6.9.41; No.12  
Gp. Form "D"  
Serial 12G/2 d.  
27.8.41; Report  
12G/S.5011/1/4/  
Int. d. 14.9.41

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(1) These operations are listed at appendix (v)B, under the heading "Operations with Bombers, other than 'Circus'". In a few of the "Ramrods" there were no bombers, the striking force consisting of cannon-fighters. For simplicity's sake these have been included under the one heading.

The "Roadstead" operations and operations against the warships at Brest which are also included in this list have already been described in the paragraphs dealing with the offensive against shipping. On the other hand all "Gudgeons" are dealt with in the succeeding paragraphs, notwithstanding that some of them were directed against ships in harbour.

(2) These operations are summarised at appendix (v)C. The code-name "Warhead" was applied to some of them.

of No.12 Group. These three operations resulted in the loss of six fighter-pilots and claims to the destruction of two enemy aircraft.

88. Bomber Command's daylight attack on power stations at Cologne, to which the code-name "Operation 77" was given, took place on August 12th. The striking force of 54 Blenheims made the outward journey from Martlesham at an altitude of 100 feet and were accompanied for the first 135 miles by twelve Whirlwinds of No.263 Squadron which then returned to England, leaving them to go on alone. On their return journey they were to have been met over Walsoorden, in Zeeland, by three long-range Spitfire Squadrons of No.10 Group (operating from No.12 Group for the purpose), which were to be accompanied and guided by another Blenheim. As the formation approached the Dutch coast this "pilot" Blenheim was shot down by enemy fighters, as was one of the Spitfires. Nevertheless the wing made contact with the returning bombers and escorted them back to England. Another three squadrons of Spitfires made a supporting sweep over Flushing. Bomber Command reported that the operation was completely successful inasmuch as the two important objectives attacked were completely destroyed, but that eleven Blenheims from the main force were lost, as well as the "pilot" aircraft. The losses of the fighter force amounted to three pilots. Some enemy aircraft were attacked but none was claimed as definitely destroyed.

89. At the end of September it was decided that the code-name "Ramrod" should be used throughout Fighter Command for operations of the kind previously known at different times and in different Groups as "Blot" and "Gudgeon". This class would include /bombing

H.Q.F.C.  
Forms "Y", etc.  
No.10 Gp. Op.  
Order No.11  
d. 7.8.41

Memo.  
FC/S.25659/  
Ops. d.  
30.9.41.

bombing operations below 5,000 feet ("Low Ramrod") and also operations in which the striking force consisted of escorted cannon fighters instead of bombers ("Fighter Ramrod").

H.Q.F.C.  
Forms "Y", etc.

90. The first operation to which the new name was applied was one in which twelve Blenheims of No.2 Group attacked the docks at Le Havre, escorted and supported by five squadrons of fighters from No.10 Group. This took place on October 15th. The bombing appeared to be reasonably successful and it was claimed that five enemy aircraft were destroyed for the loss of one pilot. Another "Ramrod" in which No.10 Group provided escort and support for Blenheims took place on October 23rd, when six bombers attacked the aerodrome at Lannion and six were to have attacked that at Morlaix, but failed to find it because of cloudy weather. On the last day of the month there were two "Low Ramrods" in which the striking forces consisted of Hurricane bombers of No.607 Squadron and escort and support were given by No.11 Group. Various objectives, including barges and a transformer station, were attacked and the bombing seemed effective. From the second operation one Hurricane-bomber and one Spitfire failed to return.

91. In November Hurricane bombers of Nos. 607 and 402 Squadrons took part in thirteen "Ramrods" and "Low Ramrods", including one in which the striking force included six Blenheims as well as a whole squadron of fighter-bombers. Losses in these operations were heavy, amounting to eighteen fighter-bomber and fighter pilots; while another ten were lost in the single "Low Ramrod" operation which took place in December. Against them could be set the damage inflicted on a variety of targets, and claims to the destruction of eight enemy aircraft in the air and two on the ground. Altogether, from the time when fighter-  
/bombers

bombers began to make these "Ramrod" and "Low Ramrod" attacks up to the end of 1941, 30 fighter-pilots were lost in the course of them and the destruction of ten enemy aircraft was claimed.

92. Other operations in the "Ramrod" class carried out between October 1st and the end of the year included an attack by Blenheims, escorted by fighters of No.10 Group, on the aerodrome at Morlaix on November 1st, when cloudy weather made it difficult to locate the target; and two "Low Ramrods" in which cannon fighters provided the striking force.

Fighter Sweeps without Bombers: Operation "Rodeo".

93. Experience gained at an early stage of the offensive, before intensive operations began, suggested that sweeps by fighters unaccompanied by bombers were not a very effective way of bringing the enemy to battle. It was emphasized on many occasions that a bomber force was needed to make the enemy come up and fightt

Part IV,  
passim.

94. Such operations, therefore, did not play a very important part in the intensive phase of the offensive. They were, however, useful as a means of training pilots, and of exercising them on occasions when bombers were not available. Occasionally - as for example on October 24th, when nine enemy aircraft were claimed as destroyed in the course of a sweep and all our pilots returned safely - they brought about a satisfactory engagement; but generally when it was decided to make an effective feint or diversion, at least one or two bombers were included in the formation if they were available.

H.Q.F.C.  
Forms "Y", etc.

95. With the intensification of the offensive against shipping, pilots making sweeps were often instructed to seek out ships as well as enemy fighters,

Ibid.

/and

and on several occasions formations of fighters were despatched for the specific purpose of attacking a particular vessel or group of vessels. Such operations were tactically very different from the sweeps over France, usually at a high altitude, with which the term "fighter sweep" was usually associated; nevertheless they may conveniently be considered under this head. (1)

Memo. FC/S.  
25659/Ops. d.  
30.9.41

96. At the end of September it was decided that in future the term "Rodeo" should be applied throughout Fighter Command to "fighter sweeps over enemy territory without bombers". Code-names were laid down for other offensive operations ("Circus", "Ramrod", "Fighter Ramrod", "Roadstead", "Rhubarb" and "Intruder"), but no provision was made for naming fighter sweeps without bombers which did not cross enemy territory. Perhaps for this reason, the new term was not readily adopted - it was used for the first time in an operational report in November - and for many weeks sweeps without bombers, whether over France or only over the Channel, continued to be called simply "sweeps".

H.Q.F.C. Forms  
"Y", No. 11 Gp.  
Reports, etc.

97. Between June 14th and December 31st, 1941, 161 patrols categorised as "fighter sweeps" or "Rodeos" were carried out. They resulted in claims to the destruction of 73 enemy aircraft and the loss of 46 pilots.

Ibid.

98. Between June 14th and the end of September there were fifteen operations of the "Warhead" type in which Whirlwinds (or on two occasions Beaufighters of Coastal Command) were escorted by fighters of No. 10 Group in operations against targets on land or at sea. (2)  
These patrols resulted in claims to the destruction of / nineteen

H.Q.F.C.  
Forms "Y", etc.  
No. 10 group  
Reports

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(1) A summary of each month's sweeps and their results appears at appendix (V)C. Sweeps against shipping as well as sweeps against enemy aircraft have been included.

(2) These operations are tabulated at appendix (V)C. See also para. 84, above, and footnote thereto.

nineteen enemy aircraft (including fourteen on the ground) and the loss of four fighter-pilots.

Operation "Rhubarb".

i. Policy and operations, 14th June to 31st August, 1941.

99. When the intensification of the daylight offensive was discussed by the Commanders-in-Chief on June 19th, no mention was made of operation "Rhubarb". Throughout the second half of June and the first half of July offensive operations involving bombers were carried out almost every day and no "Rhubarb" patrols were flown.

FC/S.24752,  
encl. 5B.

H.Q.F.C.  
Forms "Y", etc.

100. "Rhubarb" patrols were, however, resumed on July 16th. Inadequate cloud cover rendered abortive a high proportion of the sorties attempted between this date and the end of the month. No enemy aircraft were engaged in the air, but three attacks on shipping and three on other surface objectives were recorded. One pilot failed to return. (1)

H.Q.F.C.  
Forms "Y", etc.  
No. 11 Gp.  
Reports

101. In August, on the other hand, "Rhubarb" operations were undertaken on nineteen days, and only 25 patrols were abortive out of 86 begun. On three patrols enemy aircraft were engaged and 71 attacks on surface objectives were recorded. Three pilots failed to return.

Ibid.

102. The difficulty in finding surface objectives which could be legitimately and also usefully attacked, which had been noticed during the first half of the year, was again experienced. Early in August Air Vice-Marshal Evill, Senior Air Staff Officer at Headquarters, Fighter Command, expressed a fear that pilots did not always conform strictly to the "instructions governing air bombardment". About this time the question of the /casualties

FC/S.17360,  
min. 42, encl.  
45A, 52A.

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(1) A summary of "Rhubarb" patrols for the period from June 14th to Dec. 31st is given at Appendix (v)D.

casualties to civilians in occupied countries which might result from bombing by the Royal Air Force caused some concern to the War Cabinet, and later in the month the Air Ministry called the attention of Fighter Command to this matter.<sup>(1)</sup> It was true that pilots flying "Rhubarb" sorties were now permitted to attack merchant vessels in the Channel;<sup>(2)</sup> but useful and legitimate objectives on land were still not very numerous, and in the absence of positive instructions to concentrate on particular categories of objectives, pilots must always have been tempted to fire at anything that came their way.

ii. Target Policy: Autumn and Winter, 1941

103. Thus, while at first there was no disposition to relax the principle that the primary aim of operation "Rhubarb" was the destruction of enemy aircraft in the air, there gradually arose a feeling that it might be expedient to tell pilots exactly what surface objectives they could and ought to attack when circumstances compelled them to fall back on a secondary aim. In this way attacks on forbidden objectives would be reduced to a minimum and also the operation might be made to yield a better dividend.

/104.

Ibid., and  
FC/S.26289,  
encl.4A, etc.

FC/S.17360,  
encl.20A.

FC/S.19021,  
encl. 60A.

FC/S.17360,  
encl.50A. and B.

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(1) The only bombing being done at this time by Fighter Command was by aircraft on "Intruder" sorties. Nevertheless this reminder helped to draw attention to "bombardment policy" as a whole.

(2) In point of fact, subject to the permission of the Naval Commander-in-Chief concerned, authority to fire at sight at vessels in the Channel had been granted to aircraft as long ago as September, 1940. The revised bombardment instructions of June, 1940 (see Chap. IV) forbade attacks on merchant vessels as such, but added the proviso that in certain areas to be specially notified all ships could be treated as enemy transports and hence as legitimate targets. Such a special notification in respect of the English Channel was given on September 1st, 1940 but the authority to attack at sight was made subject to naval permission. After the decision to attempt the "Channel Stop" in 1941 the Admiralty issued consolidated instructions governing the conditions in which submarines, surface craft and aircraft might sink at sight in the English Channel (and also in the Bay of Biscay, North Sea and Northern Waters).

FC/S.22332,  
encl. 66A

104. About this time a study of the German transportation system in northern France and Belgium revealed that canals and the barges that moved along them made an important contribution to that system. On September 7th, therefore, the Air Officer Commanding-in-Chief, Fighter Command was asked by the Air Staff to include these barges among the objectives to be attacked by pilots flying "Rhubarb" sorties.

FC/S.25904,  
encl. 1A

105. At this time the staff of Headquarters, Fighter Command were seeking objectives against which the Whirlwinds of No.263 Squadron, with their cannon armament, could be usefully employed. One suggestion was that these aircraft should attack the "beam" transmitters used for navigational purposes by the German bomber force during the previous winter and early spring. There were various arguments against this course, of which the chief were that the transmitters had ceased to be used for active operations, the specialist units employing them having gone to the eastern front; and that they were not likely to be easily found or damaged by fighter aircraft. Alternative objectives suggested by one of the intelligence sections of the Air Staff at the Air Ministry included:

Ibid.,  
encl. 6B

- (a) Electrical transformer stations
- (b) Oil storage plants.
- (c) Gasometers
- (d) Plants distilling alcohol from beet
- (e) Barges on canals
- (f) Tank wagons on road or rail

106. Discussions between representatives of the Operations and Intelligence Sections of the Air Staff at Headquarters, Fighter Command and Intelligence Sections of the Air Staff at Air Ministry followed on September 17th. It was then agreed that the most promising of these objectives for attack by cannon fighters were distillation.

Ibid.  
encl. 10B

/plants

plants, canal barges, railway tank wagons and transformer stations. (1) Target dossiers relating to these four classes of objectives, which could be used by Intelligence Officers for briefing pilots, were prepared and distributed later in the month. A dossier relating to the "beam" stations was also prepared in case it might be decided to attack these installations at some future time.

107. The distribution of this material did not imply that the recipients were under orders to attack the objectives listed. When, however, in the middle of September it was decided that the "Circus" offensive should be curtailed (2), a corresponding decision was taken to intensify small-scale operations, including operation "Rhubarb". Experience pointed to the desirability of re-organising the important part played in the operation by attacks on surface objectives (3); and in the new instructions for operation "Rhubarb" issued in October this was done. Enemy aircraft in flight were still to be the primary objective if seen; but in future pilots flying "Rhubarb" patrols would proceed to a selected surface objective, and if they met no enemy aircraft on the way, would regard that objective as their target. These surface objectives were to be sought as far as possible amongst the four classes recommended on September 17th. (4) Attacks on alcohol distillation plants were, however, /to

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(1) Gasholders (gasometers) did not seem, on closer examination, to be very suitable objectives, as it appeared that some, if attacked with cannon, were not likely to be seriously affected, while others would probably explode with such violence as to destroy the aircraft which made the attack.

(2) See paras. 39-43 above.

(3) See Part IV, para. 32 et seq.

(4) The offensive was intended to assail (a) the electrical power system; (b) fuel distribution by rail and water; (c) the alcohol distillation industry. Item "b" would include both railway tank wagons and barges carrying fuel. In consequence of a decision by the War Cabinet on October 20th, aircraft of fighter type operating in daylight under Fighter Command Control were permitted to attack moving goods trains in occupied France from October 22nd onwards. Electrical power stations in Holland were exempt from attack on the ground that their destruction might cause economic disaster to the Dutch.

to be postponed until the beginning of the distillation season later in the year, and the programme was to be adjusted from time to time in accordance with the representations of the Target Committee which met once a fortnight at the Air Ministry under the Chairmanship of the Director of Bomber Operations.

Ibid.  
encl. 5A;  
FC/S.25904,  
encl. 15A

108. At this juncture the question of attacking "beam" transmitters was raised once more. It was suggested that the enemy had been tuning these transmitters with a view to their use in the coming winter, and as there were many arguments against trying to bomb them, the Air Officer Commanding-in-Chief, Fighter Command was again invited on October 31st to consider including them among his "Rhubarb" objectives. The view accepted by the Air Staff was that, although attacks by fighters could hardly have a lasting effect, they might put the transmitters out of action for a time and also provide useful experience. At the same time the Air Staff made it clear that in their view attacks on the objectives already listed must, in any case, take priority. In view of this qualification and of the various arguments advanced against attacking the "beam" transmitters, no definite instructions to attack them were given by Headquarters, Fighter Command to the Fighter Groups, pending further consideration of the matter. The target dossier relating to them was, however, distributed, as was a dossier relating to enemy radar stations, which the Groups were invited to attack "as alternative targets only".

109. Early in November the alcohol distillation season was reported to be in full swing and from dawn on November 7th priority over all other inland surface objectives for "Rhubarb" patrols was allotted to the  
/distillation

FC/S.26289,  
encl. 20A

Ibid.  
encl. 34A

distillation plants.<sup>(1)</sup> Thus the relative importance of the "beam" transmitters as "Rhubarb" objectives declined still further, and when a further statement of offensive policy was made by Headquarters, Fighter Command on November 26th, the question of attacking them was still left undecided.

With minor variations, the situation remained thus up to the end of 1941.

iii. Operations 1st September to 31st December, 1941

H.Q.F.C.  
Forms "Y", etc.

110. Operations during September were little affected by the growth of a "target policy". During the month 42 patrols were undertaken, of which twelve were abortive. Enemy aircraft were seen in the air on a comparatively large number of occasions, and the destruction of five was claimed. Twenty-eight attacks on surface objectives (spread over a variety of objectives) were reported. Three pilots were lost.

Ibid.

111. As a result of the decision to increase the effort devoted to small-scale operations and of weather more suitable for operation "Rhubarb", the number of patrols flown in October increased to 96, of which only 21 were abortive. The destruction of seven enemy aircraft was claimed and more than 100 attacks on surface objectives were reported. Goods wagons and other components of the railway system were the objectives most frequently attacked, accounting for a third of the recorded attacks. Canal barges were also attacked with some frequency. Five pilots were lost.

112. Two Hurricane bombers of No.607 Squadron made a "Rhubarb" patrol on October 30th, when they attacked a factory and a bridge.

/113.

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(1) This priority was cancelled on November 26th, when the Fighter Groups were instructed to attack the plants pari passu with the other objectives already listed.

113. In November 59 patrols were flown; the destruction of two enemy aircraft was claimed, and 64 attacks on surface objectives were reported. Attacks on the railway system and on alcohol distillation plants accounted for about half this total. Six pilots were lost.

Ibid.  
114. The offensive against alcohol distillation plants was pursued with some energy, both by aircraft flying "Rhubarb" sorties and by Hurricane bombers engaged in operations of the "Ramrod" class.<sup>(1)</sup> Rather heavy casualties were incurred in the "Rhubarb" and "Ramrod" operations against distilleries and other objectives undertaken at this stage, and on December 1st the Air Officer Commanding-in-Chief, Fighter Command drew the attention of the Fighter Groups to the importance of avoiding losses disproportionate to the results that might be obtained.

C.S. 11377,  
encl. 7A

H.Q.F.C.  
Forms "Y" etc.  
115. "Rhubarb" activity declined considerably in December. Thirty patrols were flown and twelve of these were abortive. On only two occasions were enemy aircraft engaged in the air, and none was claimed as destroyed. Of the 26 attacks on surface objectives recorded, about half were on alcohol distillation plants and the railway system. One pilot failed to return.

The Offensive as a whole; Summary and Comment.

116. It remains to consider the offensive as a whole from the beginning of the intensive period on June 14th up to the end of the year.<sup>(2)</sup>

/117.

(1) See para. 91, above.

(2) Claims and losses are summarised at appendix (V) F. Claims and losses in offensive operations not included in the categories already scheduled are given at appendix (V) E.

117. Setting aside political aims, the objects of the offensive may be classed as

a Immediate: namely, the destruction of objectives on the ground and of ships and enemy aircraft and the disorganisation of systems useful to the enemy.

b Ulterior: namely, to prevent the enemy from withdrawing flying units from the western front after the middle of the third week in June and induce him to return units already withdrawn.

118. To deal first with ulterior aims, it is clear from German records and the testimony of Adolf Galland that the offensive failed to bring about any substantial change in the enemy's order of battle.<sup>(1)</sup> To meet it the enemy did,

Records of 6th  
Abteilung  
(Q.M.G.)  
German Air  
Ministry;  
A.D.I. (K)  
Report No.  
373/1945

however, retain two experienced and important single-engined fighter Geschwader in northern France, and it is not at all improbable that, but for the offensive, he might have chosen to use parts of those Geschwader elsewhere. On the other hand it is not likely that, even if there had been no offensive at all, he would have entirely denuded northern France of first-line fighters, for the threat of an offensive, at least, would always have existed.

119. To turn to immediate aims, the effectiveness of the attacks made on power stations, factories, marshalling yards, ships and other surface objectives cannot be precisely assessed. Damage done to power stations is said to have restricted output from mines and factories in July, but whether the German military machine was really inconvenienced in consequence is not established. According to a report /prepared

C.S. 9419,  
encl. 17A

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(1) See para. 29, above.

(2) For details, see appendix (V) G.

FC/S.26678,  
enc. 38A

prepared by the Intelligence Staffs of the Air Ministry early in 1942, one consequence of the offensive was that industrial output from the part of France assailed fell far more sharply in 1941 than the material damage warranted. This the authors of the report ascribed to the effects of air-raid warnings and the pretext afforded to sympathetic French workers to "go slow". Yet the "unrest, possibly developing into a revolt", which the Air Staff had hoped might embarrass the occupying forces, failed to declare itself. On the other hand the offensive against shipping seems to have been effective, since the Air Officer Commanding-in-Chief, Fighter Command, was able to report towards the end of the year that the activities even of the enemy's small craft in the narrow waters in daylight had been reduced almost to nothing.

C.S.11377,  
enc. 7A

120. As for the destruction of German aircraft, the German records make it clear that, although over the whole of the period now under review our pilots destroyed less than one fifth of the number of German fighters that they claimed the strength of the opposing first-line fighter force was reduced during the summer to less than 60 per cent of establishment.<sup>(1)</sup> After our decision at the end of August to reduce the scale of attack, however, the enemy was soon able to restore the situation. Moreover, this result was obtained at a heavy cost. Between June 14th and the end of the year we lost 411 pilots in these daylight offensive operations, which resulted in claims to the destruction of 731 German fighters and the actual destruction of 135. Thus, for every German aircraft that we really destroyed during this period, we lost three pilots, and for every German aircraft that we really

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/destroyed

Records of  
6th Abteilung  
etc.

(1) For details, see appendix (V) G.

destroyed throughout the whole year, we lost nearly two-and-a-half. (1)

121. The form in which the German records have been kept makes it impossible to establish from this source which of our various types of offensive action gave the best return in terms of German aircraft destroyed. On the basis of the claims made by our pilots the most successful and cheapest operations (apart from reconnaissance flights and one or two minor operations of the "Warhead" type) were the "Circus" series. (2) There is nothing in the German records to contradict this conclusion, but it is clear that these comparatively large-scale operations, in which twenty or more squadrons of fighters, flying at heights up to 30,000 feet or so, were sometimes engaged at one time, left much room for error and duplication in the making of claims. Despite all precautions the enemy's losses in these operations were

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(1) Our total losses in the daylight offensive during the whole of 1941 amounted to 462 pilots. Incidentally, the number of pilots who lost their lives as the result of the fighting in the battle of Britain, between July 10th and October 31st, 1940 was 448.

(2) Comparative results on this basis were:

| <u>Category of Operation</u><br>(Period 14.6.41 -<br>31.12.41) | <u>E/a</u><br><u>claimed</u> | <u>Our</u><br><u>pilots</u><br><u>lost</u> | <u>E/a</u><br><u>claimed</u><br><u>per pilot</u><br><u>lost</u> |
|--|------------------------------|--|---|
| "Circus"   | 540                          | 271  | 2.0   |
| Fighter Sweeps   | 73                           | 46   | 1.6   |
| "Blot", "Gudgeon"  |                              |  |   |
| "Ramrod" etc.  | 40                           | 49   | 0.8   |
| "Roadstead"  | 23                           | 16   | 1.4   |
| Reconnaissance flights   | 22                           | 6  | 3.7   |
| "Warhead" etc.   | 19                           | 4  | 4.8   |
| "Rhubarb"  | 14                           | 19   | 0.7   |
|  | 731                          | 411  | 1.8   |

often hugely over-assessed;<sup>(1)</sup> and clearly any inferences as to our ability to destroy aircraft for aircraft in future offensives which were drawn from these figures were unsound.

122. On the other hand the German records support the more general conclusions that it was possible - as the experience of Dunkirk had suggested - for short-range fighters operating from England to assert a temporary and local air superiority over parts of northern France, and that, so long as the enemy could be induced to fight, and provided the existing ratio between the resources of either side was maintained, it was possible, at a sufficient cost in effort and losses, to reduce the strength of the opposing fighter force for a limited period. It is ironical that, just as in September, 1940 the Germans broke off their attacks on Fighter Command's aerodromes just when they seemed likely to pay a dividend, so, almost a year later, the decision to reduce the weight of our offensive was made at the very moment when the opposing fighter force was growing really weak.<sup>(2)</sup> However, the German miscalculation was far the more serious, for it is conceivable that if the attacks on aerodromes had continued for a few more weeks in the autumn of 1940, Fighter Command might have been knocked out of the battle and the way paved for a decisive military victory;

whereas,

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- (1) For example, on June 21st, when our pilots claimed the destruction of 27 enemy aircraft in "Circus XVI" and "Circus XVII" and two more in another operation, the Germans actually lost seven fighters. In "Circus XVIII", on the following day, the destruction of 31 enemy aircraft was claimed (including two by a Blenheim), but the enemy's actual losses amounted to two fighters destroyed and one damaged.
- (2) On August 23rd, 1941 J.G.2 and J.G.26, with an aggregate establishment of 248 aircraft, had only 97 serviceable aircraft between them. On the following day the last "Circus" of the month took place and thereafter the scale of attack was substantially reduced. There were only twelve "Circus" operations in September, as against 26 in August and 30 in July. By the end of September J.G.2 and J.G.26 were back almost at full strength.

whereas, if in 1941 our offensive had been maintained at its full intensity for some weeks longer, nothing more decisive would have resulted than, perhaps, an increased operational effort by the German reserve training units, or at the very most, the move of some fighters from the eastern front. The latter would undoubtedly have been hailed at the time as a triumph for our strategy; but whether, in the light of our present knowledge, it would now appear worth purchasing at the cost of the casualties which we should have suffered if the offensive had been maintained on its former scale, is another matter. As it was, another 76 fighter pilots were to be lost in "Circus" operations before the year's offensive drew to a close, and while these losses were being incurred the enemy was growing, not weaker, but stronger.

PART SIX

OFFENSIVE OPERATIONS AT NIGHT

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PART SIX

OFFENSIVE OPERATIONS AT NIGHT

Operation "Intruder"

i. Origin.

1. When, in the autumn of 1940, the enemy night offensive against this country began to assume serious proportions, various means of reducing the scale of attack were sought. Early in September it was decided that to this end some diversion of our bomber effort was justified. Accordingly, it was arranged that Blenheim bombers of No.2 Group, Bomber Command, should attack aerodromes from which German bombers were believed to be operating.<sup>(1)</sup> Heavier bombers were to attack marshalling yards through which units of the Luftwaffe in the west received their supplies of fuel and bombs.
2. After the end of the Battle of Britain this policy was reviewed. Great importance was now attached to the building-up of a bomber force for strictly offensive purposes; and it was decided at the end of November, 1940 that Blenheims of Bomber Command could, in principle, no longer be made available for attacks on aerodromes in France and the Low Countries, except in so far as such operations were a useful exercise for crews in the final stage of their training.
3. The Air Staff therefore suggested that these "security patrols", as they were called, might be made in future by aircraft of Fighter Command instead, and that for this purpose the A.I. equipment - which was too secret for its capture to be risked - should be removed from two of the twin-engined night fighter squadrons. It was pointed out that

/fighter

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(1) Aircraft of No.2 Group had operated at night against enemy bomber aerodromes in August; but later the imminent likelihood of invasion led to the suspension of these operations and the concentration of No. 2 Group's entire effort against the Channel ports. It was not until the end of October that the attacks began again in consequence of the decision reached early in September. Still earlier than this No.2 Group had operated against aerodromes in daylight and in May and June Blenheim fighters of No.604 Squadron had flown patrols each night over aerodromes in the Pas de Calais.

Min.D.H.O.-  
V.C.A.S. d.  
6.9.40.  
(D.H.O. Br.  
Folder)

S.7488,  
encl. 1A.

Ibid.,  
encl. 2A.

fighter aircraft would be able to profit by opportunities to shoot down enemy aircraft as they landed or took off, which bombers with their limited armament were seldom able to exploit.

4. By this time the advantages and disadvantages involved in using fighters instead of bombers had already been considered by the staffs of Fighter Command and No.2 Group. (1) As a result the Air Officer Commanding-in-Chief, Fighter Command, decided on December 8th that it would be desirable to devote at least one flight of No.23 Squadron, equipped with Blenheims, (2) to the task of augmenting No.2 Group's effort during the next "moon period". (3) An "operational instruction" to this effect had been drafted and the code name "Intruder" had already been chosen for the operation when the formal notification from the Air Staff respecting the future of the "security patrols" by No.2 Group was received at Headquarters, Fighter Command on December 12th. Thereupon the operational instruction for operation "Intruder" was issued, and it was decided that the whole of No.23 Squadron should be devoted to this task. To the suggestion that two squadrons of fighters should be used, the Commander-in-Chief replied by proposing that no decision respecting a second squadron should be made until some experience had been gained with the first.

FC/S.22088,  
encl. 12A -  
16A.

/ii.

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- (1) The matter was raised by G/Capt. H.P. Lloyd, M.C., D.F.C., then Senior Air Staff Officer at Headquarters, No.2 Group, in a semi-official letter to the Deputy Chief of the Air Staff, dated 1st December, 1940. In this letter he reported that at the aerodromes they visited the crews of the Blenheim bombers frequently saw numbers of enemy aircraft circling with lights burning, while awaiting their turn to land.
- (2) It was recognized that Blenheims, with their comparatively low speed and poor armament, were not the best aircraft for the job; but the Beaufighters, which were the only other night fighters with enough endurance, could not be spared.
- (3) From "half-waxing" moon to "half-waning" moon.

ii. Definition and Principles

FC/S.22088,  
encl. 12A.

5. The intention of operation "Intruder" as defined in the instruction issued on December 12th, was
- "to augment the effort of No.2 Group  
"by utilising Blenheim fighter aircraft  
"to attack enemy bombers in the vicinity  
"of their aerodromes, and to attack with  
"machine-gun fire aircraft and personnel  
"on the ground".
6. To enable this to be done, No.11 Group, in consultation with No.2 Group, were to allot to No.23 Squadron each day a group of aerodromes over which their aircraft were to patrol on the following night. Aircraft of No.2 Group would keep clear of those aerodromes. As the experience of No.2 Group had shown that it was seldom possible to see genuine aerodromes at night from a height greater than 2,000 feet, and as it was known that the Germans had many "dummy" aerodromes which could generally be seen from as high as 8,000 feet, pilots were warned not to be deceived by these well-illuminated dummies.
7. It was stipulated that, once a group of aerodromes had been designated as No.23 Squadron's target for the coming night, no other group might be substituted for it, but that information about the enemy's activities on that particular night, received subsequently, might be taken into account when deciding which of the aerodromes within the group should receive the most attention. (1)
8. In these and other instructions for the operation, and in the discussions between the Staffs of Fighter Command and No.2 Group, it was recognized that the success of operation "Intruder"

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passim

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(1) An example of such information would be the wireless traffic between enemy aircraft and their ground stations, intercepted and decoded by the branch of our intelligence organization known as the "Y" service. This "Y" information had already been found useful by No.2 Group and was to play an important part in operation "Intruder". (See footnote to para.14 and also paras. 25-39 below).

"Intruder" would depend largely on the following factors :

- (a) Good intelligence.
- (b) A continuance of the enemy's habit of making a liberal use of navigation lights or station-keeping lights.
- (c) Good navigation.
- (d) The ability of our crews, first to profit by the experience of No.2 Group and secondly to add to their own knowledge as they went along.

iii. Preparations for the Operation

9. In consequence of the decisions of December 12th, a special effort was made to prepare No.23 Squadron for its new role as rapidly as possible. Arrangements were made to provide the squadron with navigators, and crews were sent with their aircraft to one of No.2 Group's stations to discuss the operation. The A.I. equipment was removed from the squadron's Blenheims; and their equipment throughout with Mercury XV engines and rear-gun turrets was set in hand. (1) It was also decided that each aircraft should carry from eight to twelve 20 lb. bombs as well as reconnaissance flares. The "target-date" set by Fighter Command for No.23 Squadron to come into operation in its new role was December 18th. On that day No.11 Group reported that the squadron would have six aircraft available for operations on the coming night.

10. Meanwhile the intelligence bearing on the operation was being studied. In consequence it was decided that the following groups of aerodromes should be allotted to No.23 Squadron:

/(a)

- (1) On December 12th the squadron had nine aircraft equipped with Mercury XV engines and ten with the Mercury VIII.

TC/S.22088  
incl.13A and  
18A - 31A

C/S.22088,  
incl.12A, 21A.  
inmate 19.

- (a) Group I: Lille (i.e. Lille-Nord and Lille/Vendeville  
Vitry-en-Artois; Cambrai (i.e. Cambrai/  
Epincy and Cambrai/Niergnies).
- (b) Group II: Amiens/Glisy; Poix;  
Beauvais/Tille; Montdidier;  
Rosieres-en-Santerre.
- (c) Group III: Evreux (i.e. Evreux/St.  
Martin and Evreux/Le Coudray); Dreux;  
St. Andre-de-L'Eure; Caen/Carpiquet.

11. These aerodromes represented only a fraction of those known to be used by the enemy; but many of the others lay outside what was considered the practical range of the operation; and it was contemplated that further names would be added to the list as the squadron gained experience.

iv. Patrols on night 21st/22nd Dec., 1940

12. Although No. 23 Squadron was ready to operate on the night December 18th/19th - and had, indeed, had aircraft standing by for offensive operations as early as December 10th - it was not until the night December 21st/22nd that the first "Intruder" patrols were flown. <sup>(1)</sup> On this night a heavy attack was made on Liverpool. When the evidence was examined on the following day, it was concluded that all the long-range bomber Geschwader of the Luftwaffe (except K.G. 76) had contributed aircraft to this attack and that they had operated from their usual bases.

13. On the evening itself, enemy aircraft were first detected approaching this country from the direction of the Somme soon after 1700 hours. The first of them reached Liverpool a little before 1840 hours. Activity from this direction continued until 2230 hours. Later, other aircraft

/were

(1) The enemy, however, had begun to fly similar patrols over our own aerodromes at least a week or two before this.

Signal  
X.502 d.  
22.12.41.  
(A.M.T.I.S.)

H.Q.F.C.  
Forms "Y"  
etc.

were detected approaching from west Normandy (1725 to 2230 hours); the Pas de Calais (rarely and intermittently from 1730 hours to midnight, then more frequently until 0130 hours); the Low Countries (1730 to 0230 hours) and Brittany (intermittently from 1800 hours until the early morning).

14. By 1800 hours, therefore, it was clear from the evidence of the radar chain alone that German aircraft, unless diverted because of changing weather or for tactical reasons, were likely to be returning at various times during the night to bases extending from Holland to the Atlantic. Of the three groups of aerodromes allotted to No.23 Squadron, the second and third promised to be most active. (1)

15. In these circumstances, six aircraft were despatched to these two groups of aerodromes. The first, piloted by F/O Willans, left Ford aerodrome at 2020 hours and returned four hours later. The pilot, who flew without a crew, reported that he had circled over the aerodrome at Poix for twenty minutes and dropped a bomb, whereupon the aerodrome lighting had been extinguished. He had also dropped bombs and flares near Montdidier and fired at a group of lights. Finally, he had dropped the balance of his bomb-load on a group of lights at Abbeville and fired at a searchlight, which had gone out. He did not report seeing any enemy aircraft.

16. The crew of a second aircraft sent to Poix reported that they had dropped a flare and two bombs on the aerodrome, which again had caused the lights to be extinguished. They saw an aircraft pass underneath them, burning navigation lights. They also attacked a railway junction and sheds close by.

/17.

(1) As soon as the German aircraft began to turn for home, this evidence would normally be supplemented by the wireless traffic intercepted by R.A.F. Station, Cheddle, decoded there, and passed by land-line to Headquarters, Fighter Command. Thence, information likely to be of operational value would be passed in turn to Headquarters, No.11 Group, where the executive orders for operation "Intruder" were given. It is, however, impossible to establish exactly what information of this kind was actually passed on the first few nights of the operation, or the extent to which use was made of it by the Group Controller.

Ibid.,  
and  
No.23  
Squadron  
Form 540;  
also  
statement by  
W/Cdr.  
G.M.Robinson,  
formerly of  
No.23 Sqdn.

17. A third aircraft visited Montdidier, where the crew reported that they had dropped a flare and a bomb on the aerodrome, and seen two enemy aircraft taking off. The crews of the other three aircraft reported that they had visited the aerodromes at Caen, Amiens/Glisy, Evreux and St. André, as well as an aerodrome at Lisieux. An aircraft with lights burning had been seen near Amiens.

18. To sum up the results of the night's operations, four aircraft (all almost undoubtedly hostile) had been seen, and three enemy aerodromes were believed <sup>(1)</sup> to have been bombed, one of them twice. In addition a variety of other objectives had been attacked, and - perhaps most important of all - the presence of our aircraft could hardly have failed to cause some disturbance to the enemy's arrangements for homing and landing his bombers. This in turn was likely to raise the enemy's accident rate and lower the subsequent serviceability of his forces.

v. Patrols on nights 22nd/23rd, 29th/30th December, 1940 and during January, 1941.

19. Operations continued on the following night, on the night December 29th/30th, and on seven nights in January. On several occasions bad weather prevented the crews from seeing their objectives, or forced them to curtail their patrols; on others, aircraft were forced to return by mechanical troubles of one sort or another. Nevertheless,

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(1) The possibility exists that on this and subsequent occasions our crews were sometimes deceived by dummies or decoys. (A dummy is an arrangement of lights or forms simulating an aerodrome; a decoy is a real aerodrome or landing ground temporarily used for purposes of deception). It has been pointed out that reconnaissance photographs taken at this stage of the war rarely showed any craters on genuine aerodromes in the areas visited by "Intruder" aircraft, while dummies and decoys were often cratered. This cannot, however, be considered conclusive, since the bombs carried by "Intruder" aircraft in the early attacks were too small to produce obvious craters. See, however, para. 49 and footnote, below.

on four of these nine nights aircraft were seen and on two of them combats took place; on each occasion an enemy aircraft was claimed as probably destroyed.<sup>(1)</sup> On the other side of the account, a Blenheim ran short of fuel and came down in the sea on the night December 22nd/23rd; the pilot was picked up safe, but his crew of two were drowned. On each of two nights in January a Blenheim failed to return from its patrol.

vi. Summary of Apparent Results to end of January, 1941

20. The position at the end of January, 1941, was, then, that in consequence of discussions between the Staffs of No.2 Group and Fighter Command, and of the formal decision of the Air Staff to place the responsibility for patrolling enemy bomber aerodromes in France and the Low Countries ultimately on Fighter Command, the whole of No.23 Squadron had been turned over to this duty and had, in effect, assumed responsibility for three groups of aerodromes in France. So far operations had been undertaken on ten nights and 37 sorties had been flown. On five nights aircraft which were almost certainly hostile had been seen either in the air or on their aerodromes, to a total of eighteen aircraft. Two of these had been attacked in the air and were claimed as probably destroyed. Twenty-six separate bombing attacks on aerodromes had been recorded - this figure not including repeated attacks on one aerodrome by the same aircraft in the course of a single sortie. Three of our aircraft had been lost in these operations, but the pilot of one of them - though not the other two members of the crew - had been saved.

vii. Decision to continue the Operation: Re-equipment of No.23 Squadron.

21. As soon as the first bout of "Intruder" patrols had ended, on the night January 17th/18th, it became possible to consider whether the operation should continue, and, if so,

/whether  
(1) The first claim to have probably destroyed an enemy aircraft in the course of an "Intruder" patrol was made by F/O Ensor (crew, Sgts. Roberts and Langley). On the night January 2nd/3rd he opened fire near Verneuil at an aircraft burning navigation lights and saw it go down steeply with pieces falling from it.

whether its scope should be extended.

S.7488,  
encl.10A.

22. The Air Officer Commanding-in-Chief, Fighter Command, gave his own answer to these questions on January 21st, when he told the Air Ministry that, in his opinion, the operation had been successful and ought not to be dropped. For the moment, however, he made no recommendation in respect of further "Intruder" squadrons, beyond proposing that Defiants should be made available for such work by being fitted with extra tanks. To enable No.23 Squadron to go on with its work he proposed that for the time being it should retain its Blenheims, from which the A.I. equipment had been removed, and not re-arm with Havocs equipped with A.I., as it was due to do. He suggested that the Havocs equipped with A.I. should go to No.85 Squadron, a Hurricane Squadron which had already begun to re-arm with Defiants, and that instead of completing this re-armament, No.85 Squadron should forgo its Defiants in favour of another Hurricane Squadron, No.96. Finally, he proposed that No.23 Squadron should eventually re-arm with Havocs not equipped with A.I.

S.7488,  
encl.16A.

No.23 Sqdn.  
Form 540.

23. These suggestions were approved. Consequently No.23 Squadron kept its Blenheim aircraft for some months more. The first operational patrol using a Havoc was flown on the night April 7th/8th, 1941. By the end of April this aircraft had become the standard equipment of the squadron; it remained so throughout the rest of 1941.

viii. The Application of Radar, Observer Corps, and "Y" Service information to the Operation

24. So far operation "Intruder" had been reasonably successful. It did not follow that the methods of conducting it could not be improved. On this subject various opinions were ventilated at different times in 1941.

25. Broadly speaking, there were two ways in which the operation could be carried out. One way was for the Group Controller at No.11 Group, who issued the executive orders for

S.7488. FC/  
S.22088 and  
FC/S.24470,  
passim

/the

the patrols, <sup>(1)</sup> to make up his mind before the night's activity had begun, or when it had reached an early stage, which enemy aerodromes were likely to be active, and order the "Intruder" aircraft to patrol corresponding "beats". This was similar to the method practised by No.2 Group. But No.2 Group's Blenheims were fitted with wireless telephony (W/T) and therefore, after they had departed for their stereotyped "beats", could be given supplementary orders in the light of subsequent information obtained from the "Y" Service, which was often able to report that certain bombers were on their way to specified bases and were likely to arrive there at a given time. Fighter Command's aircraft did not carry W/T. As the radio-telephony (R/T) with which they were equipped was not suitable for the purpose, they could not be given orders based on any information of this kind which might be received after they had left the ground. <sup>(2)</sup> Moreover, the Group Controller had had before him a constantly changing picture of the enemy's movements, in the form of the "display" on his Operations Table, based on information contributed by the radar chain and Observer Corps. This, too, was useless for the purpose of "Intruder" once the fighters had set out. Thus the Group Controller might well find on any given evening that by the time he had good evidence that enemy bombers were likely to arrive at certain aerodromes at a particular time, some of his aircraft were irrevocably committed to stereotyped "beats", and that even if the "beats" included the aerodromes in question, the "Intruder"

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(1) On behalf of the Air Officer Commanding and in consultation with the Officer Commanding No.23 Squadron. /aircraft

(2) R/T was unsuitable because the Blenheims, operating at fairly low altitudes, passed quickly out of range, and also because a secure speech-code was not feasible and there would therefore have been a risk of compromising the "Y" Service. Proposals that attempts should be made to communicate with the aircraft by R/T at least during the early part of its flight came to nothing for the latter reason.

aircraft were unlikely to reach them at the right time. (1)

26. The other possible method was to avoid despatching "Intruder" aircraft on stereotyped "beats", hold them back until adequate evidence from the "Y" Service and the Operations Table was available, and then despatch them so as to arrive at specified aerodromes at specified times. This method stood or fell by the ability of the "Y" Service and the Operations Table to provide a sufficient number of accurate and timely forecasts of the return of enemy bombers to particular bases.

27. The original instructions for operation "Intruder", issued by Fighter Command on December 12th and by No.11 Group on December 18th, 1940, provided for the patrolling of "beats", but stipulated that the "beats" should not be chosen until information about the enemy's activity had been collected "from all available sources", and that information of this nature received after the departure of the first aircraft and relating to any aerodrome included in the "beat" selected should be passed from Headquarters, Fighter Command to No.23 Squadron via Headquarters, No.11 Group, "so that subsequent patrols may be ordered to the active site". The instructions did not say, however, whether the Group Controller or the Officer Commanding No.23 Squadron was to be ultimately responsible for ordering these last-minute modifications; and no provision was made for sending aircraft to aerodromes not included in the "beats". Indeed, this was forbidden. (2)

28. At the end of December, 1940 and beginning of January, 1941, three Officers belonging to the Intelligence  
/Staff

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(1) Timing was important, because if the "Intruder" aircraft arrived too early at an aerodrome for which enemy bombers were bound, the enemy would probably divert the bombers elsewhere. On the other hand, to arrive when all the enemy aircraft had landed was obviously unsatisfactory.

(2) Doubtless to avoid the risk of aircraft from Nos.2 and 11 Groups visiting the same aerodrome and firing at each other. As there was constant liaison between the two Groups this might, however, have been avoided without imposing this restriction.

FC/S.22088,  
encl.12A and  
31A.

FC/S.22088  
encl.49a.

Staff at Headquarters, Fighter Command conducted an experiment designed to test the capacity of the Intelligence provided by the "Y" Service, when used in conjunction with that provided by the Operations Table and their own special knowledge, to furnish the kind of information that would be needed to conduct operation "Intruder" according to the second of the methods outlined above. Stationing themselves in the Command Operations Room on four nights, they passed to Nos.2 and 11 Groups a series of forecasts of the times at which enemy bombers returning from operations over this country would arrive at stated aerodromes. At the conclusion of the experiment they reported that, out of 60 forecasts given, 22 had proved accurate as to place and 22 as to both place and time; i.e., in these 22 cases they had been able to give what they considered to be an accurate "estimated time of arrival" of enemy bombers at an aerodrome in time for an aircraft of either No.2 Group or No.11 Group (as appropriate) to be despatched and arrive there simultaneously. They added that in each case they had also given the name of the "alternative aerodrome" to which the bombers were likely to be diverted if the approach of our own aircraft caused the enemy to modify his plans.

FC/S.22088, 29.  
minute 52.

The results of this experiment were noted with approval by the Air Officer Commanding-in-Chief, Fighter Command, but it was not thought necessary to make any change in the standing instructions for the operation. The Intelligence Staff at Headquarters, Fighter Command, continued to make their forecasts; and when the results of a further series were laid before the Operations Staff in the middle of January the Wing Commander in charge of Intelligence pointed out that approximately five times out of ten they had been sufficiently accurate for working purposes, but that little or no use had been made of them because by the time they were made the few aircraft available to No.11 Group for the operation had usually been despatched on their stereotyped "beats".

Ibid.  
minute 59.

30. This observation was received without comment, and again no change was made in the standing instructions given to No.11 Group, . Nevertheless approval of these instructions - or at least of the interpretation of them by No.11 Group - was by no means universal. It was widely felt that the selection of objectives was done in too rigid a manner, that insufficient use was made of the information obtainable from the "Y" Service and the Operations Table, and that in consequence sorties were wasted on unprofitable objectives. At its best the "beat" system lacked flexibility, and as the "beats" grew quickly out of date, there was a tendency for aerodromes to be included which the enemy had ceased to use.

S.7488 and  
FC/S.22088,  
passim.

31. This feeling was not confined to the Intelligence Staff at Headquarters, Fighter Command, but extended to officers of the Air Ministry on both the Operations and Intelligence Staffs. On December 21st, before the operation began, the Director of Home Operations had written officially to Fighter Command suggesting that in planning patrols advantage might be taken of the ability of the radar chain to detect enemy aircraft further back from the French coast than they were usually plotted in the Filter Room at Stanmore. He wrote again on February 7th, 1941, to ask whether his suggestion had been adopted. (1) In March a member of his successor's staff (2) examined various aspects of the operation and reported that:

S.7488,  
passim.

Ibid.,  
encl. 6A.

Ibid.,  
encl. 15A.

"On no occasion has one aerodrome been made the  
"specific object of attack as the result of  
"trenchant information supplied by A.I.1(e)." (3)

/32

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- (1) It was still being considered.
  - (2) The functions of the Director of Operations (Home) in relation to air defence had been taken over by the Director of Fighter Operations (Air Commodore J. Whitworth-Jones).
  - (3) The Section of the Air Ministry responsible for disseminating information from the "Y" Service.

32. He recommended that Fighter Command be directed to modify the "beat" system in favour of attacks on specific aerodromes revealed as active by "Y" Service information. (1)

S.7488,  
encl.26a

33. Accordingly, on March 24th the Director of Fighter Operations wrote officially to Fighter Command, enclosing a list of those aerodromes in northern France and the Low Countries and within 170 miles of home bases which, to the best of the Air Staff's belief, were being most used by the Germans. He suggested that the selection of objectives for operation "Intruder" should be made from this list and that (as critics of the "beat" system had long recommended)

"a proportion of the 'Intruder' sorties each night be held at readiness to exploit any last-minute 'Y' information which may become available".

FC/S.22088,  
encl.106a

34. When this letter was written, a fresh instruction governing operation "Intruder" had just been issued by No.11 Group and a copy sent to Headquarters, Fighter Command, though not, of course, to the Air Ministry. To this instruction was appended a list of enemy aerodromes which differed somewhat from the Air Ministry's. (2) For the rest, the instruction called for a continuation of the "beat" system, but contained references to patrolling over aerodromes "when our Intelligence indicates that such aerodromes are active" and to operating "partly on 'Y' Service messages".

/35.

(1) One of his suggestions was that urgent information should be passed directly from the "Y" Service centre at Cheadle to Headquarters, No.11 Group. A direct telephone-line connecting the two places had been ordered in the days when the imminent equipment of No.23 Squadron with W/T was contemplated. Its installation in the summer of 1941 introduced a complication, for there was now a risk that the Intelligence officers at Cheadle and Headquarters, Fighter Command respectively might give conflicting forecasts. The Air Officer Commanding No.11 Group was therefore instructed that those originating from Fighter Command were to be preferred, since they were based on a combination of the "Y" Service intelligence with the evidence of the Operations Table and other information.

(2) It covered a wider area, extending over the parts visited by No.2 Group as well. But in the areas common to both lists, there were two aerodromes in the Air Ministry's which were not in No.11 Group's, and a dozen or so in No.11 Group's which were not in the Air Ministry's.

S.7488,  
encl.31A.

35. Fighter Command's reply to the Air Ministry's letter of March 24th was to submit a copy of this instruction, accompanied by a letter recording the view that  
"from this instruction it will be seen that  
"the present procedure is almost identical in  
"detail with that suggested in your letter".

36. As it stood, this statement was hardly in accordance with the facts. Apart from the inclusion in No.11 Group's "beats" of aerodromes which the Air Staff did not recommend for selection, there was nothing in the instruction about holding part of the "Intruder" force at readiness to exploit information received at the last minute. In writing as they did, Fighter Command may, however, have been inspired by knowledge that in future more use would in fact be made of such information. Be this as it may, for the present the statement went unchallenged.

FC/S.22088,  
encl.137A.  
140A. 144A.

37. In April it was noted that recent moves of Luftwaffe units had left vacant some of the bases most frequently visited by "Intruder" aircraft. The Air Officer Commanding No.11 Group was therefore invited to say whether he considered any alteration of method or objectives necessary. In reply he recommended that no changes be made, since there were still active aerodromes within range of "Intruder" aircraft; but he acknowledged that, unless aircraft with greater range could be made available, the effectiveness of the operation would be greatly reduced. Fortunately, when the Havoc came into service it was found to have a longer endurance than had once seemed likely, so that aerodromes in Holland and near Paris were now within range. At about this time the interest of the Air Staff in operation "Intruder" was stimulated by the success of similar operations carried out by the Germans. (1) It seemed likely

Ibid.,  
encl.152A.

Ibid., encl.  
147A and  
150A

FC/S.22088  
encl.119A

Ibid.,  
encl. 150A.

(1) Between October 1st 1940 and 31st March 1941 Bomber Command recorded 50 attacks on their aircraft while flying over the United Kingdom. These resulted in the destruction of seven aircraft and damage to 20 more. Later they reported that "on many nights when the weather is reasonable, enemy 'Intruders' operate in the vicinity of bomber aerodromes and cause considerable trouble".

that the introduction of the Havoc would go part of the way to meet the consequent demand for a more effective "Intruder" effort by Fighter Command. Other measures, however, were introduced as well. (1)

38. From the correspondence which passed at this stage between the Air Officer Commanding-in-Chief, Fighter Command and the Air Officer Commanding No.11 Group, it is clear that the latter was now fully persuaded of the advantages of despatching aircraft in accordance with current "Y" service information rather than to pre-selected designations. Nevertheless, complaints that patrols were planned too rigidly continued to be made and suggestions for improvement were not lacking. For example, the old suggestion that "Intruder" aircraft should be fitted with W/T was revived in August, and it was now proposed by the Director of Fighter Operations that they should have I.F.F. as well and be directed by officers located in one or more selected radar stations towards areas in which enemy aircraft were detected. The latter proposal was rejected as impracticable by experts at both Fighter Command and the Air Ministry, and this part of the scheme was therefore dropped.

39. Another proposal, made towards the end of 1941 by the Commanding Officer of No.23 Squadron, Wing Commander R.H.A. Leigh, and a little earlier by a member of the Intelligence Staff at Headquarters, Fighter Command, was that a special unit should be created to co-ordinate the activities of the three Commands which undertook patrols of "Intruder" type, and issue executive orders based on an expert study of the situation from moment to moment. For the time being this scheme was not considered feasible. Historically it is interesting, however, not only in the light of developments in later years, but also because it brings into relief what lay behind many criticisms of existing methods - namely, the feeling that a Group Controller, with his many other responsibilities.

(1) These are discussed in paras. 48 and 54, below.

Ibid.,  
encl. 152A

FC/S.24470,  
encl.22A and  
S.7488, encl.  
70A, 71A

S.7488  
encl. 56A

Ibid., encl.  
67A and min.  
68

S.7488,  
encl. 76A

Ibid., encl.  
69A

Ibid., encl.  
76A

responsibilities, was not the proper man to undertake the executive direction of the operation. If no part of the "Intruder" effort was to be wasted, a complicated, changing pattern of circumstances must be kept under constant observation and its meaning correctly understood in the light of expert knowledge. A Group Controller, it was argued, could not be expected to do this. Here lay the crux of a problem which was to remain unsolved throughout the period covered by this account.

ix. Patrols and Further Policy Matters, Feb. to Dec. 1941.

40. Meanwhile the operation was producing good results, even though there was a feeling in some quarters that with different methods the results might have been still better. In May, 1941, for example, no less than eleven enemy aircraft were claimed as destroyed by "Intruder" aircraft. On the other hand changing conditions added new problems to that discussed in the foregoing paragraphs.
41. It will be remembered that when he recommended on January 21st, 1941 that operation "Intruder" be continued, the Air Officer Commanding-in-Chief, Fighter Command, made no recommendation in respect of a second twin-engined "Intruder" squadron. In accordance with his suggestions, No. 23 Squadron retained its Blenheims until re-armed with Havocs without A.I. in the Spring. (1)
42. At the end of 1940, the policy towards which the Air Staff had inclined was that Fighter Command should eventually have two "Intruder" squadrons and Bomber Command cease to devote any part of its first-line effort to the bombing of aerodromes, which, strictly speaking, represented a diversion of its striking power to a strategically defensive purpose.
43. It would, however, have been impossible to form enough twin-engined fighter squadrons during the early part of 1941 to give Fighter Command two twin-engined "Intruder" squadrons

S. 7488,  
encl. 1A  
and 2A,

(1) See paras, 22 - 23, above.

squadrons as well as an adequate defensive night-fighter force. Even with extra tanks the Defiant would not be able to visit the more distant enemy bases; and indeed, even if two twin-engined "Intruder" squadrons had been available, it is doubtful whether the Air Officer Commanding-in-Chief, Fighter Command would have thought it feasible to assume responsibility for all the aerodromes hitherto visited by Bomber Command's Blenheims, since he regarded it as important that the aircraft should be able to remain near their objectives for at least an hour.

Ibid., encl.  
93A

44. In practice, therefore, Fighter Command did not take over the entire commitment from Bomber Command, and aircraft from No.2 Group continued intermittently to fly "security patrols" when their other tasks permitted them to do so. In January, 1941 it was agreed in principle that Coastal Command should also make occasional attacks on aerodromes and that these attacks should be co-ordinated with the operations of Bomber and Fighter Commands. Coastal Command was, however, committed to the support of naval operations; and early in February the Deputy Chief of the Air Staff pointed out that for this reason it would be impolitic to use aircraft of that Command for "Intruder" operations. Later in the month it was found that minelaying by the enemy was imposing a heavy strain on naval sweeping facilities and Fighter Command were asked to fly "Intruder" patrols over the bases of the minelaying units. When they excused themselves on the ground of limited range and resources, it was perceived that this was a task of naval interest which Coastal Command might legitimately be asked to undertake. The claims of the Battle of the Atlantic meant that Coastal Command were not likely to have many aircraft available for this work; nevertheless Nos.16 and 19 Groups were ordered in March to undertake patrols over at least the nearer minelaying bases whenever opportunities might occur. Thus there were now three Commands interested in this type of operation; and this situation was likely to continue at any rate until Fighter Command could be given aircraft of such range that they could

Ibid., encl.  
53A

S.7488,  
encl. 17A.

Ibid., encl.  
33A.

assume the whole commitment.

45. In the meantime their resources were limited to one squadron of Blenheims. These flew eight sorties in February and 49 in March, when the squadron claimed the destruction of two enemy aircraft. <sup>(1)</sup> In January the Officer Commanding No.152 Squadron, Squadron Leader Robinson, made a verbal request that he should be allowed to fly in a Spitfire to the neighbourhood of enemy bases for the purpose of shooting down bombers returning from operations against the United Kingdom. His squadron was then based at Warmwell. It was calculated that the only really important enemy aerodrome within effective range from this base was Caen, and that even this was near the limit for a Spitfire. The suggestion was therefore not approved.

FC/S.22088,  
encl. 53A

Ibid.,  
encl. 70A.

46. In March, however, permission was given for two Hurricanes of No.87 Squadron to fly from Warmwell to Caen during the moon-period for the purpose of attacking enemy aircraft in the air or on the ground. This operation was carried out with satisfactory results on the night March 14th/15th. The two pilots saw about 20 twin-engined aircraft widely dispersed on the aerodrome at Caen/Carpiquet and set one of them on fire. Their patrol lasted two hours, measured from the time of take-off to the time of landing, but only a few minutes were spent over the objective. This brought the total number of "Intruder" sorties flown in March to 51 and the number of enemy aircraft claimed as destroyed to three.

Ibid.,  
encl. 102A

47. The introduction of the Havoc into No.23 Squadron in April had no immediate effect on the number of patrols flown or their success. Blenheims flew 33 sorties, Havocs sixteen, and the squadron claimed the destruction of two enemy aircraft. No.87 Squadron flew two sorties on the night

April

(1) A schedule of "Intruder" patrols from their commencement until the end of 1941 appears at appendix (vi)A, and a summary at appendix (vi)B.

April 9/10th and again attacked aircraft on the ground at Caen/  
Carpiquet, although this time they did not claim any as  
destroyed. Defiants of No.141 Squadron flew six "Intruder"  
sorties, operating for the first time in this capacity on the  
night April 7/8th.

48. Ibid., encl.  
147A and  
150A

Early in May the Air Staff, having observed the effects  
of the patrols flown by German long-range nightfighters over  
aerodromes in England, called for an increased "Intruder" effort.  
No.23 Squadron, having taken the measure of their new aircraft,  
responded by flying 57 sorties and claimed the destruction of six  
enemy aircraft. No.87 Squadron flew eight sorties on three  
nights; on two of these nights the weather was so bad as to  
preclude success, and on the third they claimed the destruction  
of one aircraft. No.601 Squadron, also with Hurricanes, flew  
single sorties on three nights, but beyond seeing one enemy air-  
craft had no success. No.141 Squadron, having moved from No.11  
to No.13 Group, were not available for "Intruder" operations, but  
No.264 Squadron, also equipped with Defiants, flew nine sorties  
and claimed destruction of four enemy aircraft and damage to three  
more. Altogether 77 "Intruder" sorties were flown in May, the  
number of enemy aircraft reported as sighted was 128, eleven of  
these were claimed as destroyed, and 38 distinct bombing attacks  
on enemy aerodromes were recorded.

49. This was the zenith of achievement in the "Intruder"  
field during 1941. The monthly total of sorties for May was  
exceeded in July, but the relative smallness of the enemy's  
bomber effort against the United Kingdom during the last seven  
months of the year greatly reduced the chances of shooting down  
enemy aircraft. Between June 1st and December 31st only 112  
were reported as sighted, against 242 during the previous five  
months; and only five were claimed as destroyed, against  
sixteen. It may be argued that bombing attacks on aerodromes  
could still be made; and in fact nearly as many of these  
attacks were made in July as in the previous two months put

/together

FC/S.24470,  
encl. 22A and  
minutes 18-20.

together; but often aerodromes could not be seen unless they were lit, and they were not likely to be lit unless they were being used. Moreover, although the occasional bombing of aerodromes irrespective of the activity of the Luftwaffe was sanctioned by Headquarters, Fighter Command as a means of exercising No.23 Squadron when the enemy bomber effort fell away, (1) it was really a departure from the principles governing operation "Intruder", whose purpose was to assist in the night defence of the United Kingdom by destroying enemy night raiders and interfering with the arrangements for landing them. Except for training purposes, such bombing attacks on pre-determined objectives were therefore unsound in principle, and were calculated to expose those who ordered them to criticisms of the kind already noted.

50. The Air Officers Commanding Nos. 10 and 11 Groups were therefore reminded in July of the proper aim of operation "Intruder" and were directed to adjust their practice accordingly. At the same time it was recognized that enemy aircraft and aerodromes at which they were landing would not always be available for attack. In the absence of enemy aircraft, they were authorized to attack "night flying aerodrome facilities in their order of importance", or, if these could not be located, alternative targets such as the enemy's transportation system or, failing this, important dock areas. They were left in no doubt, however, that attacks on alternative objectives would be regarded with disfavour if carried out on nights when active operations by the enemy gave them a reasonable chance of attacking primary objectives.

51. In these circumstances, and with declining weather, the "Intruder" effort fell away markedly towards the end of the year, until in November and December it averaged less than one

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/sortie

(1) For this purpose they were allowed to carry heavier bombs than usual.

sortie a night.

52. This did not mean that the operation was regarded as dying. In the first place, no one could be sure that at some future time the bulk of the German bomber force would not return to the west. Secondly, so long as the enemy maintained even a small effort at night, operation "Intruder" would remain in at least a potentially effective means of countering it, provided fighter aircraft could be found which would reach the bases from which it was being conducted.

53. The decline of the enemy night offensive after May, 1941, therefore did not imply the abandonment of the Air Staff's view that the eventual creation of a second twin-engined "Intruder" squadron was desirable. The supply of aircraft and aircrew made it impossible, however, to contemplate forming it before the autumn, and in practice the new squadron - No.418 (R.C.A.F.) Squadron - did not begin to form until the middle of November and was not ready to operate until 1942.

S.3553,  
encl.90A  
and passim

Ibid., encl.  
96A

54. In the meantime, when the success of German operations against our bomber aerodromes stimulated interest in operation "Intruder", early in May, the Air Staff proposed that one Hurricane II aircraft fitted with an additional tank which would increase the range to something up to 1,000 miles, should be added to the establishment of each of six existing Hurricane squadrons and that these aircraft should be used for operation "Intruder".<sup>(1)</sup> This scheme was, however, abandoned early in June, as all the long-range Hurricanes available were needed as reinforcements for the Middle East.

S.7488,  
encl.35A

Ibid.,  
encl.46A

The Night Offensive, 1940-41: Recapitulation and Summary.

55. To sum up. Operation "Intruder" was begun in December, 1940 as a tactically offensive but strategically defensive measure in order to release aircraft of No.2 Group for

/strategically

(1) The squadrons selected were Nos.1, 87, 242, 247, 257 and 258.

strategically offensive tasks. The operation was at least outwardly successful, but limitations of range and the smallness of the force available prevented it from replacing altogether the "security" patrols undertaken by No.2 Group. Therefore, although the introduction of the Havoc fighter in April extended the range of operation "Intruder", No.2 Group continued intermittently to fly "security" patrols and the co-operation of Coastal Command was sought as well.

56. It was originally intended that two twin-engined fighter squadrons should be devoted to operation "Intruder" and this plan was not abandoned, although shortage of aircraft and pilots made it impossible to introduce a second squadron in 1941. In the meantime it was proposed that long-range Hurricanes should supplement the effort of the single squadron permanently available for the operation; but limitations in the supply of these aircraft and the prior claim of the Middle East Command led to the abandonment of this plan. Defiants fitted with additional tanks made occasional "Intruder" patrols and Hurricanes (not "long-range") also made a few sorties, but were unable to remain long over their objectives.

57. The system by which the last-minute planning of the patrols was largely done, and the executive orders for them were issued, but duty officers with many other responsibilities, was subjected to a good deal of criticism from inside and outside Fighter Command. A more centralized arrangement was advocated at different times by two different officers, one of them commanding the squadron principally concerned. This problem remained unsolved at the end of 1941.

58. During the period of just over twelve months covered by this account, the operation was executed on 145 nights and 573 sorties were flown - 502 of them by the squadron regularly engaged on this task (No.23) and the rest by Defiants and Hurricanes. The sighting of aircraft, known or believed to be hostile, was reported on 60 nights, and altogether the

Records of  
5th Abteilung  
(Q.M.G.)  
German Air  
Ministry

number reported as seen in the air or on the ground amounted to about 360. No.23 Squadron claimed the destruction of fourteen and the "irregular" squadrons of seven. German records show that the destruction of at least six and possibly as many as nineteen bombers can be attributed to the activities of "Intruder" aircraft. (1) Nearly 300 bombing attacks on aerodromes were recorded; there is evidence that the operation often caused the enemy to divert his homing aircraft to aerodromes other than their bases and that his accident-rate increased in consequence. No.23 Squadron lost eight aircraft on operations, six of them during the first four months; the "irregular" squadrons lost two aircraft. The rate of destruction of enemy aircraft claimed was therefore very high - in comparison with that achieved in other fighter operations - in proportion to the number of sorties flown and was satisfactory in proportion to the number of our own aircraft lost. (2)

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- (1) In thirteen cases it is not clear whether the damage which led to the destruction of the German aircraft was inflicted over France by "Intruder" aircraft or over England or the channel by defensive fighters.
  - (2) The total of 502 "Intruder" sorties cited above as flown by No.23 Squadron includes a few which were scarcely true "Intruder" sorties inasmuch as they were directed against pre-determined objectives selected without regard to the character of the enemy's operations on the night when they were made. Conversely, there were one or two minor offensive operations at night, by aircraft of squadrons other than No.23, which were not "Intruder" patrols in any sense and have not been included in the figures or judged worthy of special comment.

G.R.

APPENDICES



# PROPOSED GROUP AND SECTOR LAYOUT OF FIGHTER COMMAND FOR SPRING OF 1941 .

**NOTE**

Brackets denote sectors not actually formed in 1941. Additional sectors were formed in Wales and Ulster. Sumburgh became a sub sector.



APPENDIX (I) B

ORDER OF BATTLE OF FIGHTER COMMAND

AT 0900 HOURS, 3RD NOVEMBER 1940

(Note. The names in brackets are those by which the sectors became known later)

NO. 10 GROUP

| <u>Sector</u>                | <u>Squadron</u> | <u>Equipment</u> | <u>Aerodrome</u>     | <u>Remarks</u> |
|------------------------------|-----------------|------------------|----------------------|----------------|
| Pembrey<br>(Fairwood Common) | 79              | Hurricane        | Pembrey              | Day            |
| St. Eval<br>(Portreath)      | 234             | Spitfire         | St. Eval             | Day            |
| "                            | 247             | Gladiator        | Roborough            | Day            |
| Filton<br>(Colerne)          | 504             | Hurricane        | Filton               | Day            |
| "                            | 87              | Hurricane        | Exeter and<br>Bibury | Day            |
| "                            | 601             | Hurricane        | Exeter               | Day            |
| Middle Wallop                | 609             | Spitfire         | Middle Wallop        | Day            |
| "                            | 152             | Spitfire         | Warmwell             | Day            |
| "                            | 56              | Hurricane        | Boscome Down         | Day            |
| "                            | 238             | Hurricane        | Chilbolton           | Day            |
| "                            | 604             | Blenheim         | Middle Wallop        | Night          |

Summary: Day squadrons 10, S.E. night squadrons nil,  
T.E. night squadron 1

NO. 11 GROUP

| <u>Sector</u> | <u>Squadron</u> | <u>Equipment</u>            | <u>Aerodrome</u> | <u>Remarks</u> |
|---------------|-----------------|-----------------------------|------------------|----------------|
| Tangmere      | 145             | Hurricane                   | Tangmere         | Day            |
| "             | 213             | Hurricane                   | Tangmere         | Day            |
| "             | 602             | Spitfire                    | Westhampnett     | Day            |
| "             | 23              | Blenheim                    | Ford             | Night          |
| "             | F.I.U.          | Blenheim &<br>Beaufighter   | Tangmere         | Night          |
| Kenley        | 501             | Hurricane                   | Kenley           | Day            |
| "             | 253             | Hurricane                   | Kenley           | Day            |
| "             | 605             | Hurricane                   | Croydon          | Day            |
| "             | 219             | Blenheim &<br>Beaufighter   | Redhill          | Night          |
| Biggin Hill   | 92              | Spitfire                    | Biggin Hill      | Day            |
| "             | 74              | Spitfire                    | Biggin Hill      | Day            |
| "             | 66              | Spitfire                    | West Malling     | Day            |
| "             | 421 Flt.        | Spitfire                    | West Malling     | Day (Spotters) |
| "             | 141             | Defiant                     | Gatwick          | Night          |
| Hornchurch    | 41              | Spitfire                    | Hornchurch       | Day            |
| "             | 603             | Spitfire                    | Hornchurch       | Day            |
| "             | 222             | Spitfire                    | Hornchurch       | Day            |
| "             | 264             | Defiant                     | Rochford         | Night          |
| North Weald   | 249             | Hurricane                   | North Weald      | Day            |
| "             | 257             | Hurricane                   | North Weald      | Day            |
| "             | 17              | Hurricane                   | Martlesham       | Day            |
| "             | 46              | Hurricane                   | Stapleford       | Day            |
| Debden        | 73              | Hurricane                   | Castle Camps     | Night          |
| "             | 25              | Blenheim and<br>Beaufighter | Debden           | Night          |
| Northolt      | 615             | Hurricane                   | Northolt         | Day            |
| "             | 302             | Hurricane                   | Northolt         | Day            |
| "             | (Polish)<br>229 | Hurricane                   | Heath Row        | Day            |

Summary: Day squadrons 19½, S.E. night squadrons 3,  
T.E. night squadrons 3 (+ F.I.U.)

NO. 12 GROUP

| <u>Sector</u>         | <u>Squadron</u> | <u>Equipment</u> | <u>Aerodrome</u>                     | <u>Remarks</u> |
|-----------------------|-----------------|------------------|--------------------------------------|----------------|
| Duxford               | 242             | Hurricane        | Duxford                              | Day            |
| "                     | 19              | Spitfire         | Duxford                              | Day            |
| "                     | 310<br>(Czech)  | Hurricane        | Duxford                              | Day            |
| Coltishall            | 64              | Spitfire         | Coltishall                           | Day            |
| "                     | 72              | Spitfire         | Coltishall                           | Day            |
| Wittering             | 266             | Spitfire         | Wittering                            | Day            |
| "                     | 1               | Hurricane        | Wittering                            | Day            |
| Digby                 | 611             | Spitfire         | Digby and<br>Ternhill                | Day            |
| "                     | 151             | Hurricane        | Digby                                | Night          |
| "                     | 29              | Blenheim         | Digby and<br>Wittering               | Night          |
| Kirton-in-<br>Lindsey | 616             | Spitfire         | Kirton-in-<br>Lindsey                | Day            |
| "                     | 312<br>(Czech)  | Hurricane        | Speke                                | Day            |
| "                     | 85              | Hurricane        | Kirton-in-<br>Lindsey and<br>Caistor | Night          |
| Church Fenton         | 303<br>(Polish) | Hurricane        | Leconfield                           | Day            |

Summary: Day squadrons 11, S.E. night squadrons 2,  
T.E. night squadrons 1

NO. 13 GROUP

| <u>Sector</u>                | <u>Squadron</u> | <u>Equipment</u> | <u>Aerodrome</u>      | <u>Remarks</u>        |
|------------------------------|-----------------|------------------|-----------------------|-----------------------|
| Catterick                    | 54              | Spitfire         | Catterick             | Day                   |
| "                            | 600             | Blenheim         | Catterick<br>and Drem | Night                 |
| Usworth<br>(Ouston)          | 43              | Hurricane        | Usworth               | Day                   |
| "                            | 610             | Spitfire         | Acklington            | Day                   |
| "                            | 32              | Hurricane        | Acklington            | Day                   |
| Turnhouse                    | 607             | Hurricane        | Turnhouse             | Day                   |
| "                            | 65              | Spitfire         | Turnhouse             | Day                   |
| "                            | 263             | Hurricane        | Drem                  | Day; one<br>Flt. only |
| "                            | 232             | Hurricane        | Drem                  | Day                   |
| "                            | 1<br>(Canadian) | Hurricane        | Prestwick             | Day                   |
| Aldergrove<br>(Ballyhalbert) | 245             | Hurricane        | Aldergrove            | Day                   |

Summary: Day squadrons 9½ S.E. night squadrons nil,  
T.E. night squadron 1

NO. 14 GROUP

| <u>Sector</u>       | <u>Squadron</u> | <u>Equipment</u> | <u>Aerodrome</u>     | <u>Remarks</u> |
|---------------------|-----------------|------------------|----------------------|----------------|
| Dyce<br>(Peterhead) | 111             | Hurricane        | Dyce and<br>Montrose | Day            |
| Kirkwall            | 3               | Hurricane        | Castle town          | Day            |

Summary: Day squadrons 2, night squadrons nil

NON-OPERATIONAL

| <u>Sector</u>      | <u>Squadron</u> | <u>Equipment</u> | <u>Aerodrome</u>  | <u>Remarks</u>        |
|--------------------|-----------------|------------------|-------------------|-----------------------|
| Biggin Hill        | 422 Flt.        | Hurricane        | Gravesend         | Night                 |
| Church Fenton      | 306<br>(Polish) | Hurricane        | Church Fenton     | Day-forming           |
| "                  | 71<br>(Eagle)   | Buffalo          | Church Fenton     | Day-forming           |
| Kirton-in-Lindsey  | 307<br>(Polish) | Defiant          | Kirton-in-Lindsey | Night-forming         |
| Baginton (Honiley) | 308<br>(Polish) | Hurricane        | Baginton          | Day-forming           |
| Turnhouse          | 263             | Whirlwind        | Drem              | Day; one Flt. forming |

Summary: Day squadrons formed nil, day squadrons forming  $3\frac{1}{2}$ , S.E. night squadrons formed  $\frac{1}{2}$ , S.E. night squadron forming 1, T.E. night squadrons nil.

SUMMARY FOR WHOLE COMMAND

|                                     | <u>Day Squadrons</u> |               | <u>Night Squadrons</u> |             | <u>Total</u>    |
|-------------------------------------|----------------------|---------------|------------------------|-------------|-----------------|
|                                     | <u>S.E.</u>          | <u>T.E.</u>   | <u>S.E.</u>            | <u>T.E.</u> |                 |
| No.10 Group                         | 10                   | -             | -                      | 1           | 11              |
| No.11 Group<br>(excluding F.I.U.)   | $19\frac{1}{2}$      | -             | 3                      | 3           | $25\frac{1}{2}$ |
| No.12 Group                         | 11                   | -             | 2                      | 1           | 14              |
| No.13 Group                         | $9\frac{1}{2}$       | -             | -                      | 1           | $10\frac{1}{2}$ |
| No.14 Group                         | 2                    | -             | -                      | -           | 2               |
| <hr/>                               |                      |               |                        |             |                 |
| Total of squadrons formed           | 52                   | -             | 5                      | 6           | 63              |
| Squadrons forming                   | 3                    | $\frac{1}{2}$ | 1                      | -           | $4\frac{1}{2}$  |
| <hr/>                               |                      |               |                        |             |                 |
| Total of squadrons formed & forming | 55                   | $\frac{1}{2}$ | 6                      | 6           | $67\frac{1}{2}$ |

Note: F.I.U. and No.422 Flight have been excluded from the above summary as officially non-operational units (although the former frequently took part in active operations). No.420 Flight (later No.93 Squadron) does not appear in the official order of battle issued by Fighter Command for this date (although it had been formed), and is therefore omitted from both the order of battle and the summary. At the time its equipment consisted only of three Harrow aircraft.

ORDER OF BATTLE OF FIGHTER COMMAND

AT 0900 HOURS 6TH APRIL 1941

(Note. The names in brackets are those by which the Sectors became known later.)

NO. 9 GROUP

| Sector                | Squadron        | Equipment                | Aerodrome                | Remarks |
|-----------------------|-----------------|--------------------------|--------------------------|---------|
| Jurby<br>(Andreas)    | 258             | Hurricane                | Jurby                    | Day     |
| Speke<br>(Woodvale)   | 315<br>(Polish) | Hurricane                | Speke                    | Day     |
| "                     | 229             | Hurricane                | Speke                    | Day     |
| "                     | 96              | Hurricane<br>and Defiant | Crnage                   | Night   |
| "                     | 256             | Defiant                  | Squire's Gate            | Night   |
| Rhosneigr<br>(Valley) | 312<br>(Czech)  | Hurricane                | Rhosneigr<br>and Penrose | Day     |
| Ternhill<br>(Atcham)  | 605             | Hurricane                | Ternhill                 | Day     |
| Baginton<br>(Honiley) | 308<br>(Polish) | Hurricane                | Baginton                 | Day     |

Summary: Day squadrons 6, S.E. night squadrons 2,  
T.E. night squadrons nil.

NO. 10 GROUP

| Sector                       | Squadron        | Equipment    | Aerodrome                     | Remarks |
|------------------------------|-----------------|--------------|-------------------------------|---------|
| Pembrey<br>(Fairwood Common) | 238             | Hurricane II | Pembrey and<br>Carew Cheriton | Day     |
| "                            | 316<br>(Polish) | Hurricane    | Pembrey                       | Day     |
| "                            | 79              | Hurricane    | Pembrey                       | Day     |
| Portreath                    | 247             | Hurricane    | Roborough and<br>St. Eval     | Day     |
| "                            | 263             | Whirlwind    | Portreath                     | Day     |
| Filton<br>(Colerne)          | 118             | Spitfire     | Filton                        | Day     |
| "                            | 501             | Hurricane    | Filton                        | Day     |
| "                            | 87              | Hurricane    | Charmy Down                   | Night   |
| "                            | 307<br>(Polish) | Defiant      | Colerne                       | Night   |
| Exeter                       | 504             | Hurricane    | Exeter                        | Day     |
| "                            | 66              | Spitfire II  | Exeter                        | Day     |
| Middle Wallop                | 604             | Beaufighter  | Middle Wallop                 | Night   |
| "                            | 93              | Havoc et al  | Middle Wallop                 | Mining  |
| "                            | 32              | Hurricane II | Ibsley                        | Day     |
| "                            | 152             | Spitfire II  | Warmwell                      | Day     |
| "                            | 234             | Spitfire II  | Warmwell                      | Day     |

Summary: S.E. day squadrons 11, T.E. day squadron 1,  
S.E. night squadrons 2, T.E. night squadron 1,  
aerial mining squadron 1.

NO. 11 GROUP

| Sector   | Squadron        | Equipment    | Aerodrome    | Remarks |
|----------|-----------------|--------------|--------------|---------|
| Tangmere | 145             | Spitfire II  | Tangmere     | Day     |
| "        | 616             | Spitfire II  | Tangmere     | Day     |
| "        | 610             | Spitfire II  | Westhampnett | Day     |
| "        | 302<br>(Polish) | Hurricane II | Westhampnett | Day     |

NO. 11 GROUP - Continued

| <u>Sector</u> | <u>Squadron</u> | <u>Equipment</u>    | <u>Aerodrome</u> | <u>Remarks</u> |
|---------------|-----------------|---------------------|------------------|----------------|
| Tangmere      | 219             | Beaufighter         | Tangmere         | Night          |
| "             | 23              | Blenheim and Havoc  | Ford             | Night          |
| "             | F.I.U.          | Mixed               | Ford             | Night          |
| Kenley        | 1               | Hurricane II        | Kenley           | Day            |
| "             | 615             | Hurricane II        | Kenley           | Day            |
| "             | 264             | Defiant             | Biggin Hill      | Night          |
| Biggin Hill   | 609             | Spitfire II         | Biggin Hill      | Day            |
| "             | 92              | Spitfire V          | Biggin Hill      | Day            |
| "             | 74              | Spitfire II         | Manston          | Day            |
| "             | 91              | Spitfire II         | Hawkinge         | Day            |
| "             | 141             | Defiant             | Gravesend        | Night          |
| Hornchurch    | 64              | Spitfire II         | Hornchurch       | Day            |
| "             | 611             | Spitfire II         | Hornchurch       | Day            |
| "             | 54              | Spitfire II         | Southend         | Day            |
| North Weald   | 249             | Hurricane II        | North Weald      | Day            |
| "             | 56              | Hurricane II        | North Weald      | Day            |
| Debden        | 85              | Hurricane and Havoc | Debden           | Night          |
| "             | 242             | Hurricane II        | Martlesham       | Day            |
| Northolt      | 601             | Hurricane II        | Northolt         | Day            |
| "             | 303             | Spitfire II         | Northolt         | Day            |
|               | (Polish)        |                     |                  |                |

Summary: Day squadrons 18, S.E. night squadrons 2 $\frac{1}{2}$   
T.E. night squadrons 2 $\frac{1}{2}$  (+ F.I.U.) (including one "Intruder" squadron)

NO. 12 GROUP

| <u>Sector</u>     | <u>Squadron</u> | <u>Equipment</u>         | <u>Aerodrome</u>                      | <u>Remarks</u> |
|-------------------|-----------------|--------------------------|---------------------------------------|----------------|
| Duxford           | 19              | Spitfire II              | Fowlmere                              | Day            |
| "                 | 310             | Hurricane II             | Duxford                               | Day            |
|                   | (Czech)         |                          |                                       |                |
| Coltishall        | 222             | Spitfire II              | Coltishall                            | Day            |
| "                 | 257             | Hurricane                | Coltishall                            | Day            |
| Wittering         | 266             | Spitfire II              | Wittering                             | Day            |
| "                 | 151             | Defiant and Hurricane    | Wittering                             | Night          |
| "                 | 25              | Beaufighter              | Wittering                             | Night          |
| Digby             | 401             | Hurricane                | Digby                                 | Day            |
|                   | (Canadian)      |                          |                                       |                |
| "                 | 402             | Hurricane                | Digby                                 | Day            |
| "                 | (Canadian)      |                          |                                       |                |
| "                 | 29              | Beaufighter and Blenheim | Wellingore                            | Night          |
| Kirton-in-Lindsey | 65              | Spitfire II              | Kirton-in-Lindsey                     | Day            |
| "                 | 71              | Hurricane                | Kirton-in-Lindsey                     | Day            |
| "                 | (Eagle)         |                          |                                       |                |
| "                 | 255             | Defiant                  | Kirton-in-Lindsey                     | Night          |
| Church Fenton     | 46              | Hurricane                | Church Fenton and Sherburn - in-Elmet | Day            |

Summary: Day squadrons 10, S.E. night squadrons 2, T.E. night squadrons 2

NO. 13 GROUP

| <u>Sector</u>                | <u>Squadron</u> | <u>Equipment</u>          | <u>Aerodrome</u>      | <u>Remarks</u>          |
|------------------------------|-----------------|---------------------------|-----------------------|-------------------------|
| Catterick                    | 41              | Spitfire                  | Catterick             | Day                     |
| Ouston                       | 72              | Spitfire                  | Acklington            | Day                     |
| "                            | 317<br>(Polish) | Hurricane                 | Acklington            | Day; one<br>Flight only |
| Turnhouse                    | 603             | Spitfire II               | Turnhouse             | Day                     |
| "                            | 602             | Spitfire                  | Prestwick             | Day                     |
| "                            | 43              | Hurricane                 | Drem                  | Day                     |
| "                            | 607             | Hurricane                 | Drem                  | Day                     |
| "                            | 600             | Blenheim &<br>Beaufighter | Drem and<br>Prestwick | Night.                  |
| Aldergrove<br>(Ballyhalbert) | 245             | Hurricane                 | Aldergrove            | Day                     |

Summary: Day squadrons 7 $\frac{1}{2}$ , S.E. night squadrons nil  
T.E. night squadrons 1

NO. 14 GROUP

| <u>Sector</u>       | <u>Squadron</u> | <u>Equipment</u> | <u>Aerodrome</u>           | <u>Remarks</u> |
|---------------------|-----------------|------------------|----------------------------|----------------|
| Dyce<br>(Peterhead) | 111             | Hurricane        | Dyce                       | Day            |
| "                   | 232             | Hurricane        | Elgin and<br>Montrose      | Day            |
| Kirkwell            | 17              | Hurricane        | Castletown                 | Day            |
| "                   | 213             | Hurricane        | Castletown<br>and Sunbrugh | Day            |
| "                   | 260             | Hurricane        | Skitten                    | Day            |
| "                   | 253             | Hurricane        | Skeabrae                   | Day            |

Summary: Day squadrons 6, night squadrons nil

NON-OPERATIONAL SQUADRONS

| <u>Sector</u>         | <u>Squadron</u>   | <u>Equipment</u> | <u>Aerodrome</u> | <u>Remarks</u>                |
|-----------------------|-------------------|------------------|------------------|-------------------------------|
| Baginton<br>(Honiley) | 403<br>(Canadian) | Tomahawk         | Baginton         | Day; forming                  |
| Debden                | 3                 | Hurricane II     | Martlesham       | Day                           |
| Northolt              | 306<br>(Polish)   | Hurricane II     | Northolt         | Day                           |
| Church Fenton         | 485<br>(N.Z.)     | Spitfire         | Driffield        | Day; forming                  |
| Ouston                | 317<br>(Polish)   | Hurricane        | Acklington       | Day; one<br>Flight<br>forming |
| Catterick             | 68                | Blenheim         | Catterick        | Night;<br>forming             |

Summary: Day squadrons formed 2, day squadrons forming 2 $\frac{1}{2}$ ,  
T.E. night squadron forming 1

SUMMARY FOR WHOLE COMMAND

|  | <u>Day Squadrons</u> |             | <u>Night Squadrons</u> |             |                                     | <u>Total</u> |
|--|----------------------|-------------|------------------------|-------------|-------------------------------------|--------------|
|  | <u>S.E.</u>          | <u>T.E.</u> | <u>S.E.</u>            | <u>T.E.</u> | <u>Aerial Mining and "Intruder"</u> |              |
| No. 9 Group                            | 6                    | -           | 2                      | -           | -                                   | 8            |
| No.10 Group                            | 11                   | 1           | 2                      | 1           | 1                                   | 16           |
| No.11 Group<br>(excluding<br>F.I.U.)   | 18                   | -           | 2½                     | 1½          | 1                                   | 23           |
| No.12 Group                            | 10                   | -           | 2                      | 2           | -                                   | 14           |
| No.13 Group                            | 7½                   | -           | -                      | 1           | -                                   | 8½           |
| No.14 Group                            | 6                    | -           | -                      | -           | -                                   | 6            |
| Non-operational<br>(formed)            | 2                    | -           | -                      | -           | -                                   | 2            |
| <hr/>                                  |                      |             |                        |             |                                     |              |
| Total of<br>squadrons formed           | 60½                  | 1           | 8½                     | 5½          | 2                                   | 77½          |
| Squadrons<br>forming                   | 2½                   | -           | -                      | 1           | -                                   | 3½           |
| <hr/>                                  |                      |             |                        |             |                                     |              |
| Total of squadrons<br>formed & forming | 63                   | 1           | 8½                     | 6½          | 1                                   | 81           |
| <hr/> <hr/>                            |                      |             |                        |             |                                     |              |

Note: The figures in the above summary include No.93 (Aerial Mining) Squadrons, but not F.I.U.

APPENDIX (I) D

ORDER OF BATTLE OF FIGHTER COMMAND

AT 0900 HOURS, 15th JUNE, 1941

(Note: The names in brackets are those by which the Sectors became known later)

NO. 9 GROUP

| <u>Sector</u>         | <u>Squadron</u>        | <u>Equipment</u>           | <u>Aerodrome</u> | <u>Remarks</u>          |
|-----------------------|------------------------|----------------------------|------------------|-------------------------|
| Ramsey<br>(Andreas)   | 302<br>(Polish)        | Hurricane I                | Jurby            | Day                     |
| Speke<br>(Woodvale)   | 315<br>(Polish)        | Hurricane I                | Speke            | Day                     |
| "                     | 96                     | Defiant and<br>Hurricane I | Cranage          | Night                   |
| "                     | 256                    | Defiant and<br>Hurricane I | Squire's Gate    | Night                   |
| Valley                | 615                    | Hurricane I                | Valley           | Day                     |
| "                     | 219<br>(one<br>flight) | Beaufighter I              | Valley           | Night;<br>one<br>flight |
| Ternhill<br>(Atcham)  | 403<br>(R.C.A.F.)      | Spitfire I                 | Ternhill         | Day                     |
| "                     | 68                     | Beaufighter I              | Hill ErCALL      | Night                   |
| Baginton<br>(Honiley) | 605                    | Hurricane II A             | Baginton         | Day                     |

Summary: Day squadrons 5, S.E. night squadrons 2,  
T.E. night squadron 1½,

NO. 10 GROUP

| <u>Sector</u>                | <u>Squadron</u> | <u>Equipment</u>      | <u>Aerodrome</u> | <u>Remarks</u> |
|------------------------------|-----------------|-----------------------|------------------|----------------|
| Pembrey<br>(Fairwood Common) | 32              | Hurricane II A<br>& B | Angle            | Day            |
| "                            | 316<br>(Polish) | Hurricane I           | Pembrey          | Day            |
| "                            | 79              | Hurricane II A        | Fairwood Common  | Day            |
| Portreath                    | 152             | Spitfire II A         | Portreath        | Day            |
| "                            | 247             | Hurricane I &<br>I A  | Portreath        | Day            |
| "                            | 66              | Spitfire II A         | Perranporth      | Day            |
| Colerne                      | 501             | Spitfire I &<br>IIA   | Colerne          | Day            |
| "                            | 600             | Beaufighter I<br>& II | Colerne          | Night          |
| "                            | 263             | Whirlwind             | Filton           | Day            |
| "                            | 87              | Hurricane I           | Charmy Down      | Night          |
| Exeter                       | 307             | Defiant               | Exeter           | Night          |
| "                            | 504             | Hurricane I           | Exeter           | Day            |
| Middle Wallop                | 604             | Beaufighter I         | Middle Wallop    | Night          |
| "                            | 93              | Havoc                 | Middle Wallop    | Mining         |
| "                            | 118             | Spitfire IIA          | Ibsley           | Day            |
| "                            | 234             | Spitfire II A         | Warmwell         | Day            |
| "                            | 308<br>(Polish) | Spitfire II A         | Chilbolton       | Day            |

Summary: S.E. day squadrons 11, T.E. day squadron 1,  
S.E. night squadrons 2, T.E. night squadrons 2,  
Aerial mining squadron 1.

## NO. 11 GROUP

| Sector      | Squadron          | Equipment      | Aerodrome    | Remarks    |
|-------------|-------------------|----------------|--------------|------------|
| Tangmere    | 145               | Spitfire III B | Merston      | Day        |
| "           | 616               | Sptifire II A  | Westhampnett | Day        |
| "           | 219               | Beaufighter I  | Tangmere     | Night;     |
| "           | (less one flight) |                |              | one flight |
| "           | 23                | Havoc          | Ford         | Night      |
| "           | F.I.U.            | Mixed          | Ford         | (Intruder) |
| "           | 610               | Spitfire II A  | Westhampnett | Night      |
|             |                   | & B            |              | Day        |
| Kenley      | 312               | Hurricane II A | Kenley       | Day        |
| "           | (Czech)           | & B            |              |            |
| "           | 258               | Hurricane II B | Kenley       | Day        |
| "           | 1                 | Hurricane II B | Redhill      | Day        |
| Biggin Hill | 609               | Spitfire V B   | Biggin Hill  | Day        |
| "           | 92                | Spitfire V B   | Biggin Hill  | Day        |
| "           | 601               | Hutticane II B | Manston      | Day        |
| "           | 91                | Spitfire V B   | Hawkinge     | Day        |
| "           | 74                | Spitfire V B   | Gravesend    | Day        |
| "           | 264               | Defiant        | West Malling | Night      |
| "           | 29                | Beaufighter I  | West Malling | Night      |
| Hornchurch  | 603               | Spitfire V A   | Southend     | Day        |
| "           | 54                | Spitfire V A   | Hornchurch   | Day        |
| "           | 611               | Spitfire V A   | Hornchurch   | Day        |
| North Weald | 56                | Hurricane II B | North Weald  | Day        |
| "           | 242               | Hurricane II B | Hunsdon      | Day        |
| "           | 85                | Havoc          | Hunsdon      | Night      |
| Debden      | 3                 | Hurricane II B | Martlesham   | Day        |
| "           |                   | & C            |              |            |
| "           | 71                | Hurricane II B | Martlesham   | Day        |
|             |                   | (Eagle)        |              |            |
| Northolt    | 303               | Spitfire II B  | Northolt     | Day        |
| "           | (Polish)          |                |              |            |
| "           | 306               | Hurricane II B | Northolt     | Day        |
| "           | (Polish)          |                |              |            |

Summary: Day squadrons 20, S.E. night squadron 1, T.E. night squadrons 2½ (+ 1 Intruder and F.I.U.)

## NO. 12 GROUP

| Sector            | Squadron     | Equipment      | Aerodrome         | Remarks |
|-------------------|--------------|----------------|-------------------|---------|
| Duxford           | 19           | Spitfire II A  | Fowlmere          | Day     |
| "                 | 310          | Hurricane II A | Duxford           | Day     |
|                   | (Czech)      |                |                   |         |
| Coltishall        | 222          | Spitfire II B  | Matlask           | Day     |
| "                 | 257          | Hurricane II B | Coltishall        | Day     |
|                   |              | & C            |                   |         |
| Wittering         | 25           | Beaufighter I  | Wittering         | Night   |
| "                 | 151          | Defiant and    | Wittering         | Night   |
|                   |              | Hurricane I    |                   |         |
| "                 | 266          | Spitfire II A  | Collyweston       | Day     |
| Digby             | 401          | Hurricane II A | Wellingore        | Day     |
|                   | (R.C.A.F.)   |                |                   |         |
| "                 | 402          | Hurricane II A | Coleby Grange     | Day     |
|                   | (R.C.A.F.)   |                |                   |         |
| Kirton-in-Lindsey | 65           | Spitfire II A  | Kirton-in-Lindsey | Day     |
| "                 | 255          | Defiant and    | Hibaldstow        | Night   |
|                   |              | Hurricane I    |                   |         |
| "                 | 452          | Spitfire II A  | Kirton-in-Lindsey | Day     |
|                   | (R.A.F.)     |                |                   |         |
| Church Fenton     | 485          | Spitfire II A  | Leconfield        | Day     |
|                   | (R.N.Z.A.F.) |                |                   |         |

Summary: Day squadrons 10, S.E. night squadrons 2, T.E. night squadron 1.

NO. 13 GROUP

| <u>Sector</u> | <u>Squadron</u> | <u>Equipment</u>      | <u>Aerodrome</u>      | <u>Remarks</u>      |
|---------------|-----------------|-----------------------|-----------------------|---------------------|
| Catterick     | 313<br>(Czech)  | Spitfire I            | Catterick             | Day; one flight op. |
| "             | 41              | Spitfire II A         | Catterick             | Day                 |
| Ouston        | 72              | Spitfire II A         | Acklington            | Day                 |
| "             | 317<br>(Polish) | Hurricane I           | Ouston                | Day                 |
| Turnhouse     | 122             | Spitfire I            | Turnhouse             | Day; one flight op. |
| "             | 123             | Spitfire I            | Turnhouse             | Day; one flight op. |
| "             | 64              | Spitfire II A         | Drem                  | Day                 |
| "             | 43              | Hurricane II A<br>& B | Drem                  | Day                 |
| Ayr           | 602             | Spitfire I &<br>II A  | Ayr                   | Day                 |
| "             | 141             | Defiant               | Ayr and<br>Acklington | Night               |
| Aldergrove    | 245             | Hurricane I           | Aldergrove            | Day                 |

Summary: Day squadrons 8 $\frac{1}{2}$ . S.E. night squadron 1.

NO. 14 GROUP

| <u>Sector</u> | <u>Squadron</u> | <u>Equipment</u> | <u>Aerodrome</u>        | <u>Remarks</u>      |
|---------------|-----------------|------------------|-------------------------|---------------------|
| Dyce          | 111             | Spitfire II A    | Dyce and<br>Montrose    | Day                 |
| Kirkwall      | 17              | Hurricane I      | Castletown<br>and Elgin | Day                 |
| "             | 607             | Hurricane I      | Skitten                 | Day                 |
| "             | 253             | Hurricane I      | Skeabrae                | Day                 |
| "             | 124             | Spitfire I       | Castletown              | Day; one flight op. |

Summary: Day squadrons 4 $\frac{1}{2}$ . night squadrons nil

NON-OPERATIONAL SQUADRONS

| <u>Sector</u>     | <u>Squadron</u>   | <u>Equipment</u> | <u>Aerodrome</u>  | <u>Remarks</u>           |
|-------------------|-------------------|------------------|-------------------|--------------------------|
| Kirton-in-Lindsey | 121<br>(Eagle)    | Hurricane I      | Kirton-in-Lindsey | Day; training            |
| Catterick         | 313<br>(Czech)    | Spitfire I       | Catterick         | Day; one flight training |
| Ouston            | 406<br>(R.C.A.F.) | Blenheim         | Acklington        | Night; Forming           |
| Turnhouse         | 122               | Spitfire I       | Turnhouse         | Day; one flight forming  |
| Turnhouse         | 123               | Spitfire I       | Turnhouse         | Day; one flight forming  |
| Kirkwall          | 124               | Spitfire I       | Castletown        | Day; one flight training |

Summary: Day squadrons 3, T.E. night squadron 1.

SUMMARY FOR WHOLE COMMAND

|                                       | <u>Day</u>  |             | <u>Night</u> |             | <u>Int-<br/>ruder</u> | <u>Aerial<br/>Mining</u> | <u>Total</u> |
|---------------------------------------|-------------|-------------|--------------|-------------|-----------------------|--------------------------|--------------|
|                                       | <u>S.E.</u> | <u>T.E.</u> | <u>S.E.</u>  | <u>T.E.</u> |                       |                          |              |
| No. 9 Group                           | 5           | -           | 2            | 1½          | -                     | -                        | 8½           |
| No. 10 Group                          | 11          | 1           | 2            | 2           | -                     | 1                        | 17           |
| No. 11 Group<br>(excluding<br>F.I.U.) | 20          | -           | 1            | 2½          | 1                     | -                        | 24½          |
| No. 12 Group                          | 10          | -           | 2            | 1           | -                     | -                        | 13           |
| No. 13 Group                          | 8½          | -           | 1            | -           | -                     | -                        | 9½           |
| No. 14 Group                          | 4½          | -           | -            | -           | -                     | -                        | 4½           |
|                                       | 59          | 1           | 8            | 7           | 1                     | 1                        | 77           |
| Non-operational                       | 3           | -           | -            | 1           | -                     | -                        | 4            |
|                                       | 62          | 1           | 8            | 8           | 1                     | 1                        | 81           |

ANALYSIS BY FUNCTIONS

(figures on 6.4.41 in brackets)

|                                  |        |        |
|----------------------------------|--------|--------|
| S.E. day squadrons               | 62(63) |        |
| T.E. day squadrons               | 1(1)   |        |
| Total of day squadrons           |        | 63(64) |
| S.E. night squadrons             | 8(8½)  |        |
| T.E. night squadrons             | 8(6½)  |        |
| True defensive night squadrons   |        | 16(15) |
| Intruder squadron                |        | 1(1)   |
| Aerial mining squadron           |        | 1(1)   |
| Total of night squadrons         |        | 18(17) |
| Total of day and night squadrons |        | 81(81) |

## ORDER OF BATTLE OF FIGHTER COMMAND

AT 2200 HOURS, 25TH DECEMBER, 1941

## NO. 9 GROUP

| <u>Sector</u> | <u>Squadron</u>   | <u>Equipment</u>           | <u>Aerodrome</u> | <u>Remarks</u>           |
|---------------|-------------------|----------------------------|------------------|--------------------------|
| Andreas       | 457<br>(R.A.A.F.) | Spitfire VB                | Andreas          | Day                      |
| Woodvale      | 308<br>(Polish)   | Spitfire IIA               | Woodvale         | Day                      |
| "             | 256               | Defiant I and<br>Hurricane | Squire's Gate    | Night                    |
| Valley        | 350<br>(Belgian)  | Spitfire IIA               | Valley           | Day; one<br>flight op.   |
| "             | 456<br>(R.A.A.F.) | Beaufighter II             | Valley           | Night; one<br>flight op. |
| "             | 74                | Spitfire VB                | Llanbedr         | Day                      |
| Atcham        | 131               | Spitfire VB                | Atcham           | Day                      |
| "             | 96                | Defiant I and<br>Hurricane | Wrexham          | Night                    |
| "             | 68                | Beaufighter I              | High Erccall     | Night                    |
| Honiley       | 257               | Hurricane II B             | Honiley          | Day                      |

Summary: Day squadrons 5½, S.E. night squadrons 2,  
T.E. night squadrons 1½.

## NO. 10 GROUP

| <u>Sector</u>      | <u>Squadron</u>       | <u>Equipment</u>               | <u>Aerodrome</u>        | <u>Remarks</u>    |
|--------------------|-----------------------|--------------------------------|-------------------------|-------------------|
| Fairwood<br>Common | 79                    | Hurricane II B<br>(Long Range) | Fairwood Common         | Day               |
| "                  | 125<br>(Newfoundland) | Defiant I                      | Fairwood Common         | Night             |
| "                  | 615                   | Hurricane II B                 | Angle                   | Day               |
| Portreath          | 66                    | Spitfire II A<br>(long range)  | Portreath               | Day               |
| "                  | 247                   | Hurricane II C                 | Predannack              | Night             |
| "                  | 1457 Flight           | Havoc (Turbin-<br>lite)        | Predannack              | Night<br>(Flight) |
| "                  | 600                   | Beaufighter II                 | Predannack              | Night             |
| "                  | 130                   | Spitfire VA & B                | Perranporth             | Day               |
| "                  | 310<br>(Czech)        | Spitfire VB                    | Perranporth             | Day               |
| Colerne            | 87                    | Hurricane II C                 | Colerne and<br>Scillies | Night             |
| "                  | 1454 Flight           | Havoc (Turbin-<br>lite)        | Colerne                 | Night<br>(Flight) |
| "                  | 263                   | Whirlwind                      | Charmy Down             | Day               |
| Exeter             | 307<br>(Polish)       | Beaufighter II                 | Exeter                  | Night             |
| "                  | 317<br>(Polish)       | Spitfire V B                   | Exeter                  | Day               |
| "                  | 306<br>(Polish)       | Spitfire V B                   | Church Stanton          | Day               |
| "                  | 302<br>(Polish)       | Spitfire V B                   | Harrowbeer              | Day               |
| Middle<br>Wallop   | 604                   | Beaufighter I                  | Middle Wallop           | Night             |
| "                  | 1458 Flight           | Havoc (Turbin-<br>lite)        | Middle Wallop           | Night<br>(Flight) |

NO. 10 GROUP - Cont'd

| <u>Sector</u> | <u>Squadron</u>   | <u>Equipment</u>                    | <u>Aerodrome</u> | <u>Remarks</u> |
|---------------|-------------------|-------------------------------------|------------------|----------------|
| Middle Wallop | 245               | Hurricane II B & C                  | Middle Wallop    | Day            |
| "             | 118               | Spitfire V B                        | Ibsley           | Day            |
| "             | 501               | Spitfire V B                        | Ibsley           | Day            |
| "             | 234               | Spitfire V B                        | Ibsley           | Day            |
| "             | 402<br>(R.C.A.F.) | Hurricane II B<br>(Fighter-bombers) | Warmwell         | Day<br>(F.B.)  |

Summary: S.E. day squadrons 12 (+1 F.B.), T.E. day squadron 1, S.E. night squadrons 3, T.E. night squadrons 3 (+ equivalent of 1½ Turbinlite squadrons)

NO. 11 GROUP

|             |                     |                                     |              |                     |
|-------------|---------------------|-------------------------------------|--------------|---------------------|
| Tangmere    | 1                   | Hurricane II C                      | Tangmere     | Day                 |
| "           | 219                 | Beaufighter I                       | Tangmere     | Night               |
| "           | 1455 Flight         | Havoc (Turbinlite)                  | Tangmere     | Night<br>(Flight)   |
| "           | 41                  | Spitfire V B                        | Westhampnett | Day                 |
| "           | 129                 | Spitfire V B                        | Westhampnett | Day                 |
| "           | 23                  | Havoc I and Boston III              | Ford         | Night<br>(Intruder) |
| "           | F.I.U.              | Mixed                               | Ford         | (Night)             |
| Kenley      | 452<br>(R.A.A.F.)   | Spitfire V B                        | Redhill      | Day                 |
| "           | 602                 | Spitfire V B                        | Kenley       | Day                 |
| "           | 485<br>(R.N.Z.A.F.) | Spitfire V B                        | Kenley       | Day                 |
| Biggin Hill | 72                  | Spitfire V B                        | Gravesend    | Day                 |
| "           | 124                 | Spitfire V B                        | Biggin Hill  | Day                 |
| "           | 91                  | Spitfire V B                        | Hawkinge     | Day                 |
| "           | 401<br>(R.C.A.F.)   | Spitfire V B                        | Biggin Hill  | Day                 |
| "           | 264                 | Defiant II                          | West Malling | Night               |
| "           | 29                  | Beaufighter I                       | West Malling | Night               |
| "           | 1452 Flight         | Havoc (Turbinlite)                  | West Malling | Night<br>(Flight)   |
| Hornchurch  | 64                  | Spitfire V B                        | Hornchurch   | Day                 |
| "           | 411<br>(R.C.A.F.)   | Spitfire V B                        | Hornchurch   | Day                 |
| "           | 313<br>(Czech)      | Spitfire V B                        | Hornchurch   | Day                 |
| "           | 32                  | Hurricane II B & C                  | Manston      | Day                 |
| "           | 607                 | Hurricane II B<br>(Fighter-bombers) | Manston      | Day<br>(F.B.)       |
| North Weald | 222                 | Spitfire V B                        | North Weald  | Day                 |
| " "         | 403<br>(R.C.A.F.)   | Spitfire V B                        | North Weald  | Day                 |
| " "         | 121<br>(Eagle)      | Spitfire V B                        | North Weald  | Day                 |
| " "         | 3                   | Hurricane II C                      | Hunsdon      | Day                 |
| " "         | 1451 Flight         | Havoc (Turbinlite)                  | Hunsdon      | Night<br>(Flight)   |
| " "         | 85                  | Havoc II                            | Hunsdon      | Night               |
| Debden      | 71<br>(Eagle)       | Spitfire V B                        | Martlesham   | Day                 |
| "           | 65                  | Spitfire V B                        | Debden       | Day                 |
| "           | 111                 | Spitfire V B                        | Debden       | Day                 |
| Northolt    | 315<br>(Polish)     | Spitfire V B                        | Northolt     | Day                 |

NO. 11 GROUP (Cont'd.)

| <u>Sector</u> | <u>Squadron</u> | <u>Equipment</u> | <u>Aerodrome</u> | <u>Remarks</u> |
|---------------|-----------------|------------------|------------------|----------------|
| Northolt      | 316<br>(Polish) | Spitfire V B     | Northolt         | Day            |
| "             | 303<br>(Polish) | Spitfire V B     | Northolt         | Day            |

Summary: Day Squadrons 24 (+ 1 F.B.). S.E. Night Squadron 1, T.E. Night Squadrons 3 (+ 1 Intruder, equivalent of 1½ Turbinlite Squadrons and F.I.U.)

NO. 12 GROUP

| <u>Sector</u>         | <u>Squadron</u>   | <u>Equipment</u>                 | <u>Aerodrome</u>            | <u>Remarks</u>                  |
|-----------------------|-------------------|----------------------------------|-----------------------------|---------------------------------|
| Duxford               | 601               | Airacobra                        | Duxford                     | Day                             |
| "                     | 56                | Hurricane II B                   | Duxford                     | Day: re-equipping with Typhoon. |
| Coltishall            | 255               | Beaufighter II                   | Coltishall                  | Night                           |
| "                     | 152               | Spitfire II A<br>(long range)    | Coltishall                  | Day                             |
| "                     | 137               | Whirlwind                        | Matlask                     | Day: one flight op.             |
| "                     | 19                | Spitfire V B                     | Ludham                      | Day                             |
| Wittering             | 25                | Beaufighter I                    | Wittering                   | Night                           |
| "                     | 151               | Defiant II and<br>Hurricane II C | Wittering and<br>Coltishall | Night                           |
| "                     | 266               | Spitfire V B                     | Kingscliffe                 | Day                             |
| "                     | 1453 Flight       | Havoc (Turbin-<br>lite)          | Wittering                   | Night<br>(Flight)               |
| Digby                 | 92                | Spitfire V B                     | Digby                       | Day                             |
| "                     | 609               | Spitfire V B                     | Digby                       | Day                             |
| "                     | 409               | Beaufighter II                   | Coleby Grange               | Night                           |
| "                     | (R.C.A.F.)<br>412 | Spitfire V B                     | Wellingore                  | Day                             |
| "                     | (R.C.A.F.)<br>616 | Spitfire V B                     | Kirton-in-<br>Lindsey       | Day                             |
| Kirton-in-<br>Lindsey | 1459 Flight       | Havoc (Turbin-<br>lite)          | Hibaldstow                  | Night<br>(Flight)               |
| "                     | 253               | Hurricane II B                   | Hibaldstow                  | Day                             |
| Church<br>Fenton      | 610               | Spitfire V B                     | Leconfield                  | Day                             |

Summary: S.E. day squadrons 11, T.E. day squadrons ½, S.E. night squadrons 1, T.E. night squadrons 3 (+ equivalent of 1 Turbinlite squadron).

NO. 13 GROUP

| <u>Sector</u> | <u>Squadron</u>   | <u>Equipment</u>      | <u>Aerodrome</u> | <u>Remarks</u> |
|---------------|-------------------|-----------------------|------------------|----------------|
| Catterick     | 145               | Spitfire V B          | Catterick        | Day            |
| "             | 122               | Spitfire V B          | Scorton          | Day            |
| Ouston        | 406               | Beaufighter II        | Acklington       | Night          |
| "             | (R.C.A.F.)<br>43  | Hurricane II A<br>& B | Acklington       | Day            |
| Turnhouse     | 410               | Defiant I             | Drem and Ouston  | Night          |
| "             | (R.C.A.F.)<br>611 | Spitfire II A<br>& B  | Drem             | Day            |

NO. 13 GROUP (Cont'd.)

| <u>Sector</u> | <u>Squadron</u> | <u>Equipment</u> | <u>Aerodrome</u> | <u>Remarks</u>      |
|---------------|-----------------|------------------|------------------|---------------------|
| Turnhouse     | 340<br>(F.F.)   | Spitfire II A    | Drem             | Day; one flight Op. |
| Ayr           | 141             | Beaufighter I    | Ayr              | Night               |
| "             | 312<br>(Czech)  | Spitfire V B     | Ayr              | Day                 |

Summary: Day squadrons 5 $\frac{1}{2}$ , S.E. night squadron 1, T.E. night squadrons 2.

NO. 14 GROUP

| <u>Sector</u> | <u>Squadron</u>    | <u>Equipment</u> | <u>Aerodrome</u>     | <u>Remarks</u> |
|---------------|--------------------|------------------|----------------------|----------------|
| Dyce          | 603                | Spitfire V B     | Dyce                 | Day            |
| "             | 132                | Spitfire II B    | Peterhead & Montrose | Day            |
| Tain          | -                  | -                | -                    | See below      |
| Kirkwall      | 54                 | Spitfire II B    | Castletown           | Day            |
| "             | 331<br>(Norwegian) | Spitfire II A    | Skeabrae & Sumburgh  | Day            |
| "             | 123                | Spitfire II A    | Castletown & Tain    | Day            |

Summary: Day squadrons 5.

NO. 82 GROUP

| <u>Sector</u> | <u>Squadron</u> | <u>Equipment</u> | <u>Aerodrome</u>          | <u>Remarks</u>                          |
|---------------|-----------------|------------------|---------------------------|---|
| St. Angelo    | -               | -                | -                         | See below                               |
| Ballyhalbert  | 504             | Spitfire II A    | Ballyhalbert & St. Angelo | Day                                     |
| "             | 153             | Defiant I        | Ballyhalbert              | Night; re-equipping with Beau-fighter I |
| Eglinton      | 133<br>(Eagle)  | Spitfire II A    | Eglinton                  | Day                                     |

Summary: Day squadrons 2, S.E. night squadron 1.

NON-OPERATIONAL SQUADRONS

| <u>Sector</u> | <u>Squadron</u>   | <u>Equipment</u>    | <u>Aerodrome</u> | <u>Remarks</u>    |
|---------------|-------------------|---------------------|------------------|-------------------|
| Valley        | 350<br>(Belgian)  | Spitfire II A       | Valley           | Day; one flight   |
| "             | 456<br>(R.A.A.F.) | Beaufighter II      | Valley           | Night; one flight |
| Honiley       | 1456 Flight       | Havoc (Turbin-lite) | Honiley          | Night; flight     |
| Colerne       | 417<br>(R.C.A.F.) | Spitfire II A       | Charmy Down      | Day               |
| Debden        | 418<br>(R.C.A.F.) | Boston III          | Debden           | Night (Intruder)  |
| "             | 157               | Mosquito            | Castle Camps     | Night             |
| Duxford       | 154               | Spitfire II A       | Fowlmere         | Day               |
| Coltishall    | 137               | Whirlwind           | Matlask          | Day; one flight   |
| Catterick     | 134               | Spitfire V A        | Catterick        | Day               |
| Ouston        | 1460 Flight       | Havoc (Turbin-lite) | Acklington       | Night; flight     |

NON-OPERATIONAL SQUADRONS (Cont'd.).

| <u>Sector</u> | <u>Squadron</u>   | <u>Equipment</u> | <u>Aerodrome</u> | <u>Remarks</u>  |
|---------------|-------------------|------------------|------------------|-----------------|
| Turnhouse     | 81                | Spitfire V A     | Turnhouse        | Day             |
| "             | 340<br>(F.F.)     | Spitfire II A    | Drem             | Day; one flight |
| Dyce          | 416<br>(R.C.A.F.) | Spitfire II A    | Peterhead        | Day             |

Summary: S.E. day squadrons 6, T.E. day squadron  $\frac{1}{2}$ , T.E. night squadrons  $1\frac{1}{2}$  (+ 1 Intruder and equivalent of 1 Turbinlite squadron).

SUMMARY FOR WHOLE COMMAND

|                                    | <u>Day Squadrons</u> |                                  |             | <u>Night Squadrons</u> |                                   |                  |                   | <u>Total</u>    |
|------------------------------------|----------------------|----------------------------------|-------------|------------------------|-----------------------------------|------------------|-------------------|-----------------|
|                                    | <u>S.E.</u>          | <u>T.E.</u>                      | <u>F.B.</u> | <u>S.E.</u>            | <u>T.E.</u>                       | <u>Int-ruder</u> | <u>Turbinlite</u> |                 |
| No. 9 Group                        | $5\frac{1}{2}$       | -                                | -           | 2                      | $1\frac{1}{2}$                    | -                | -                 | 9               |
| No. 10 Group                       | 12                   | 1                                | 1           | 3                      | 3                                 | -                | $1\frac{1}{2}$    | $21\frac{1}{2}$ |
| No. 11 Group<br>(excluding F.I.U.) | 24                   | -                                | 1           | 1                      | 3                                 | 1                | $1\frac{1}{2}$    | $31\frac{1}{2}$ |
| No. 12 Group                       | 11                   | $\frac{1}{2}$                    | -           | 1                      | 3                                 | -                | 1                 | $16\frac{1}{2}$ |
| No. 13 Group                       | $5\frac{1}{2}$       | -                                | -           | 1                      | 2                                 | -                | -                 | $8\frac{1}{2}$  |
| No. 14 Group                       | 5                    | -                                | -           | -                      | -                                 | -                | -                 | 5               |
| No. 82 Group                       | 2                    | -                                | -           | 1                      | -                                 | -                | -                 | 3               |
| <b>Total operational</b>           | <b>65</b>            | <b><math>1\frac{1}{2}</math></b> | <b>2</b>    | <b>9</b>               | <b><math>12\frac{1}{2}</math></b> | <b>1</b>         | <b>4</b>          | <b>95</b>       |
| <b>Non-operational</b>             | <b>6</b>             | <b><math>\frac{1}{2}</math></b>  | <b>-</b>    | <b>-</b>               | <b><math>1\frac{1}{2}</math></b>  | <b>1</b>         | <b>1</b>          | <b>10</b>       |
|                                    | <b>71</b>            | <b>2</b>                         | <b>2</b>    | <b>9</b>               | <b>14</b>                         | <b>2</b>         | <b>5</b>          | <b>105</b>      |

ANALYSIS BY FUNCTIONS

|   |            |
|---|------------|
| S.E. day squadrons                            | 71         |
| T.E. day squadrons                            | <u>2</u>   |
| Total of defensive day squadrons              | 73         |
| Fighter-bomber squadrons                      | <u>2</u>   |
| Total of day squadrons                        | <u>75</u>  |
| S.E. night squadrons                          | 9          |
| T.E. night squadrons (defensive)              | <u>14</u>  |
| Total of defensive night squadrons            | 23         |
| Intruder squadrons                            | <u>2</u>   |
| Total of true night squadrons                 | <u>25</u>  |
| Total of true squadrons                       | 100        |
| Equivalent in squadrons of Turbinlite flights | <u>5</u>   |
| Grand total                                   | <u>105</u> |

BALLOON BARRAGES: FLYING QUOTAS AND BALLOONSFLYING AT 2100 HOURS, 1st NOVEMBER, 1940.

(Note: The "flying quota" of a barrage was the number of balloons it was authorized by Headquarters, Balloon Command to fly. This number was sometimes more and sometimes less than its theoretical establishment.)

|                     |               | <u>Flying Quota</u> |      | <u>Balloons Flying</u> |      |
|---------------------|---------------|---------------------|------|------------------------|------|
| <u>No. 30 Group</u> | London        | 415                 |      | 385                    |      |
|                     | Thames        | 24                  |      | 23                     |      |
|                     | Channel       | 8                   |      | 6                      |      |
|                     | Dover         | 24                  |      | 15                     |      |
|                     | Langley       | 24                  |      | 24                     |      |
|                     | Harwich       | 27                  |      | 20                     |      |
|                     | Weybridge     | 24                  | 546  | 23                     | 496  |
| <u>No. 31 Group</u> | Birmingham    | 125                 |      | 86                     |      |
|                     | Coventry      | 56                  |      | 37                     |      |
|                     | Derby         | 32                  |      | 32                     |      |
|                     | Liverpool     | 72                  |      | 71                     |      |
|                     | Runcorn       | 47                  |      | 47                     |      |
|                     | Crewe         | 32                  |      | 31                     |      |
|                     | Manchester    | 55                  |      | 56                     |      |
|                     | Milford Haven | 24                  |      | 18                     |      |
|                     | Cardiff       | 35                  |      | 36                     |      |
|                     | Barry         | 16                  |      | 13                     |      |
|                     | Swansea       | 31                  |      | 9                      |      |
|                     | Port Talbot   | 16                  |      | 8                      |      |
|                     | Newport       | 32                  | 573  | 31                     | 475  |
| <u>No. 32 Group</u> | Avonmouth     | 32                  |      | 32                     |      |
|                     | Filton        | 24                  |      | 23                     |      |
|                     | Bristol       | 32                  |      | 31                     |      |
|                     | Brockworth    | 24                  |      | 24                     |      |
|                     | Yeovil        | 24                  |      | 23                     |      |
|                     | Portsmouth    | 56                  |      | 54                     |      |
|                     | Southampton   | 74                  |      | 66                     |      |
|                     | Plymouth      | 42                  |      | 43                     |      |
|                     | Falmouth      | 24                  | 332  | 17                     | 313  |
| <u>No. 33 Group</u> | Sheffield     | 68                  |      | 68                     |      |
|                     | Hull          | 74                  |      | 70                     |      |
|                     | Newcastle     | 64                  |      | 64                     |      |
|                     | Blyth         | 8                   |      | 8                      |      |
|                     | Billingham    | 48                  | 262  | 48                     | 258  |
| <u>No. 34 Group</u> | Glasgow       | 81                  |      | 80                     |      |
|                     | Forth         | 48                  |      | 47                     |      |
|                     | Scapa         | 48                  |      | 14                     |      |
|                     | Ardeer        | 24                  |      | 24                     |      |
|                     | Belfast       | 28                  |      | 20                     |      |
|                     | Londonderry   | 16                  | 245  | 14                     | 199  |
|                     | Totals        |                     | 1958 |                        | 1741 |

These balloons included 809 with the D.P.L. device and 1515 with ripping-links.

APPENDIX (I) G

BALLOON BARRAGES: FLYING QUOTAS AND BALLOONS

FLYING AT 2100, HOURS 1ST APRIL 1941

|  | <u>Flying Quota</u> | <u>Balloons Flying</u> |
|--|---------------------|------------------------|
| <u>No. 30 Group</u>  |                     |                        |
| London   | 400                 | 397                    |
| Thames   | 17                  | 17                     |
| Channel  | 8                   | 8                      |
| Dover  | 24                  | 22                     |
| Langley  | 24                  | 24                     |
| Harwich  | 27                  | 24                     |
| Weybridge (including<br>the small Mark V1<br>balloon)            | <u>38</u> 538       | <u>38</u> 530          |
| <u>No. 31 Group</u>  |                     |                        |
| Birmingham   | 168                 | 164                    |
| Coventry   | 72                  | 71                     |
| Derby  | 32                  | 32                     |
| Milford Haven  | 24                  | 12                     |
| Cardiff (including Mk V1)  | 28                  | 32                     |
| Barry  | 16                  | 16                     |
| Swansea  | 32                  | 20                     |
| Port Talbot  | 16                  | 15                     |
| Newport  | <u>32</u> 420       | <u>33</u> 395          |
| (Liverpool, Runcorn,<br>Crewe and Manchester<br>to No. 33 Group) |                     |                        |
| <u>No. 32 Group</u>  |                     |                        |
| Avonmouth  | 32                  | 32                     |
| Filton   | 24                  | 24                     |
| Bristol  | 32                  | 32                     |
| Brockworth   | 24                  | 24                     |
| Yeovil   | 24                  | 24                     |
| Portsmouth   | 56                  | 61                     |
| Southampton  | 74                  | 72                     |
| (Plymouth (including Mk V1)                                      | 53                  | 47                     |
| Falmouth   | <u>24</u> 343       | <u>3</u> 319           |
| <u>No. 33 Group</u>  |                     |                        |
| Liverpool  | 110                 | 108                    |
| Runcorn  | 64                  | 64                     |
| Crewe  | 32                  | 32                     |
| Manchester   | 80                  | 90                     |
| Sheffield  | 72                  | 72                     |
| Hull   | 74                  | 71                     |
| Accrington   | <u>24</u> 456       | <u>22</u> 459          |
| (Newcastle, Blyth<br>and Billingham to<br>No. 34 Group)          |                     |                        |
| <u>No. 34 Group</u>  |                     |                        |
| Newcastle  | 64                  | 66                     |
| Blyth  | 8                   | 8                      |
| Billingham   | 48                  | 47                     |
| Glasgow  | 112                 | 110                    |
| Forth  | 48                  | 48                     |
| Scapa  | 48                  | 45                     |
| Ardeer   | 24                  | 23                     |
| Belfast  | 40                  | 38                     |
| Londonderry  | 16                  | 15                     |
| Methil   | 8                   | 5                      |
| Clyde (including Mk V1)  | <u>18</u> 434       | <u>7</u> 412           |
| Totals (including 43 and 22<br>Mark V1 respectively)             | <u>2191</u>         | <u>2115</u>            |

These balloons included 1162 with the D.P.L. device and 1913 with ripping-links

THE ATTACK AND DEFENCE OF COASTWISE SHIPPING,  
NOVEMBER 1940 TO DECEMBER 1941

Appendix (II)A

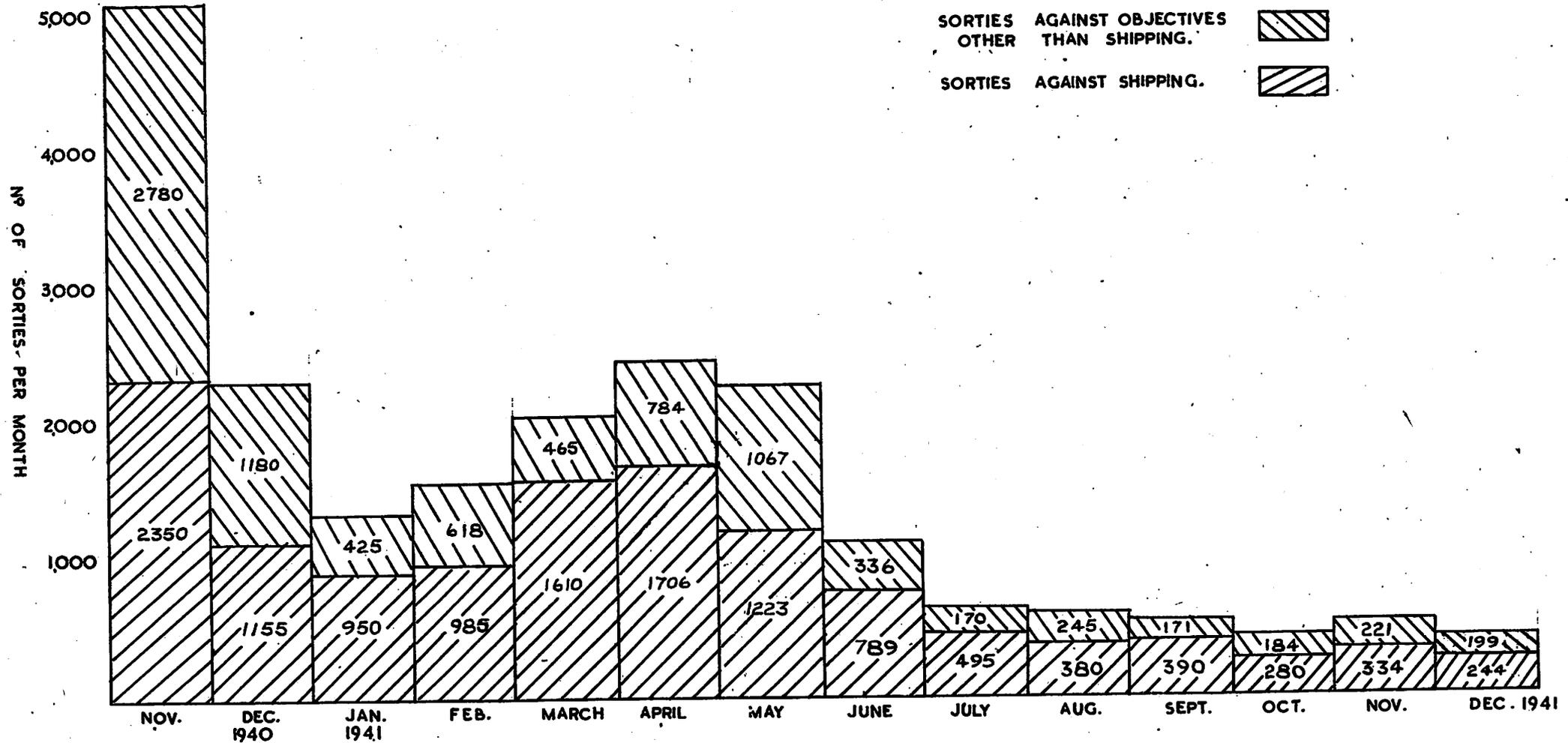
| MONTH     | 1. G.A.F. DAYLIGHT OFFENSIVE SORTIES |                  |                          | 2. ATTACKS BY G.A.F. ON MERCHANT VESSELS WITHIN 40 MILES OF COAST AND AN R.A.F. AERODROME |       |                |     |                  |     |        | 3. F.C. DAYLIGHT DEFENSIVE SORTIES |                             |         |                     |                          |     |
|-----------|--------------------------------------|------------------|--------------------------|---|-------|----------------|-----|------------------|-----|--------|------------------------------------|-----------------------------|---------|---------------------|--------------------------|-----|
|           | (a)                                  | (b)              | (c)                      | (a)   |       | (b)            |     | (c)              |     | (d)    |                                    | (e)                         | (a)     | (b)                 | (c)                      |     |
|           | Total                                | Against Shipping | Proportion of (b) to (a) | Vessel Sunk   |       | Vessel Damaged |     | Vessel Undamaged |     | Totals |                                    | Proportion of Night Attacks | Total   | To protect Shipping | Proportion of (b) to (a) |     |
|           |                                      |                  | Day                      | Night   | Day   | Night          | Day | Night            | Day | Night  | Day                                | Night                       |         |                     |                          |     |
| 1940      |                                      |                  |                          |   |       |                |     |                  |     |        |                                    |                             |         |                     |                          |     |
| November  | 5130                                 | 2350             | 46%                      | 3   | 11 8  |                | 17  |                  | 64  |        | 81                                 | 11                          | 12%     | 14154               | 402                      | 3%  |
| December  | 2335                                 | 1155             | 49%                      | <del>4</del>  | - 1   |                | 11  | -                | 18  | -      | 33                                 | -                           | -       | 6843                | 504                      | 7%  |
| 1941      |                                      |                  |                          |   |       |                |     |                  |     |        |                                    |                             |         |                     |                          |     |
| January   | 1375                                 | 950              | 69%                      | 2   | -     |                | 9   | 1                | 20  | 4      | 31                                 | 5                           | 14%     | 3836                | 350                      | 9%  |
| February  | 1603                                 | 985              | 61%                      | 7 2   | 31-4  |                | 13  | 2                | 21  | 11     | 41                                 | 16                          | 28%     | 5736                | 443                      | 8%  |
| March     | 2075                                 | 1610             | 78%                      | 21 2  | 39-4  |                | 32  | 12               | 36  | 4      | 89                                 | 19                          | 18%     | 11672               | 2103                     | 18% |
| April     | 2490                                 | 1706             | 69%                      | 10 4  | 110-1 |                | 29  | 28               | 85  | 33     | 124                                | 72                          | 37%     | 16102               | 7876                     | 49% |
| May       | 2290                                 | 1223             | 53%                      | 7 -   | 110-1 |                | 8   | 15               | 26  | 34     | 41                                 | 60                          | 59%     | 15812               | 8287                     | 52% |
| June      | 1125                                 | 789              | 70%                      | 3 2   | 20 5- |                | 12  | 25               | 25  | 34     | 40                                 | 79                          | 66%     | 12635               | 7331                     | 58% |
| July      | 665                                  | 495              | 74%                      | 1 -   | 7 5-3 |                | 1   | 20               | 9   | 41     | 11                                 | 68                          | 86%     | 9924                | 6475                     | 65% |
| August    | 625                                  | 380              | 61%                      | 4   | 2 2   |                | 6   | 14               | 10  | 18     | 17                                 | 34                          | 67%     | 8282                | 5685                     | 69% |
| September | 561                                  | 390              | 70%                      | - 2   | 6 5   |                | 2   | 17               | 14  | 24     | 16                                 | 47                          | 75%     | 6444                | 4416                     | 69% |
| October   | 464                                  | 280              | 60%                      | 1 1   | 4 5   |                | 2   | 9                | 5   | 20     | 8                                  | 33                          | 80%     | 6682                | 4072                     | 61% |
| November  | 555                                  | 334              | 60%                      | 4 -   | 8 5   |                | 5   | 17               | 17  | 13     | 23                                 | 38                          | 62%     | 6631                | 3952                     | 60% |
| December  | 443                                  | 244              | 55%                      | 4 -   | 2 1   |                | 1   | 11               | 4   | 14     | 6                                  | 27                          | 82%     | 5594                | 3591                     | 64% |
| TOTALS    | 21,736                               | 12,891           | 59%                      | 147   |       | 319            |     | 604              |     | 561    | 509                                | 48%                         | 130,347 | 54,787              | 42%                      |     |

- NOTES (1). Figures throughout Col.1 are based on contemporary estimates.  
(2). "Night" includes civil twilight throughout Col.2.  
(3). Col.2(b) includes vessels structurally undamaged but in which crews suffered casualties.

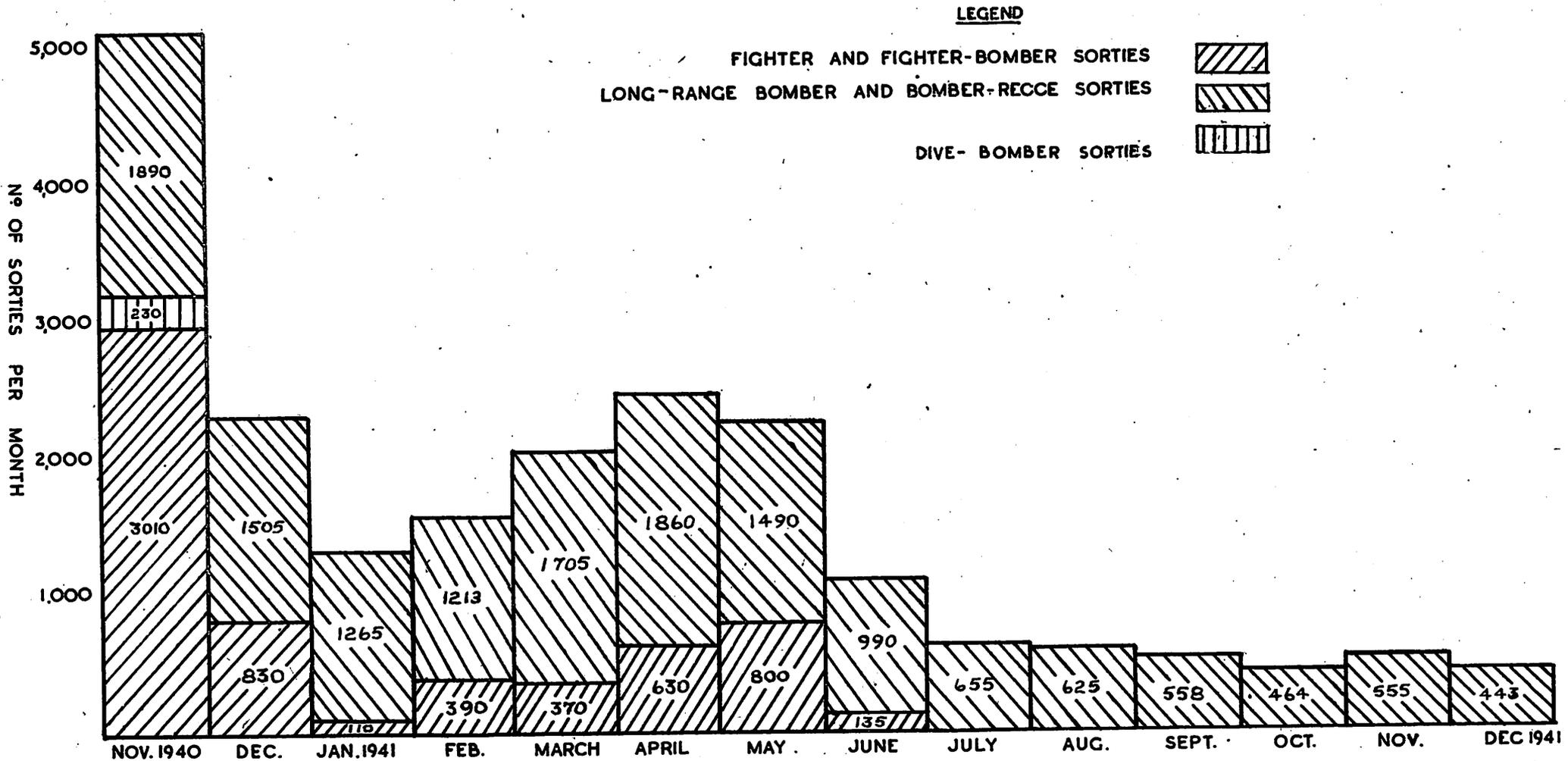
HISTOGRAM SHOWING MONTHLY DISTRIBUTION OF DAYLIGHT EFFORT BY  
LUFTWAFFE BETWEEN SHIPPING AND OTHER OBJECTIVES.

LEGEND

- SORTIES AGAINST OBJECTIVES OTHER THAN SHIPPING. 
- SORTIES AGAINST SHIPPING. 

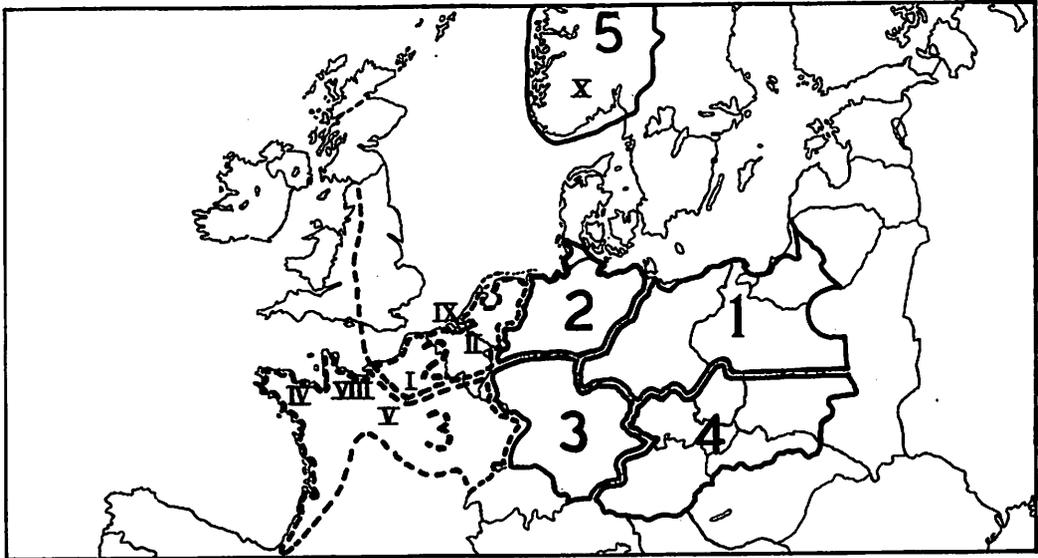


**HISTOGRAM SHOWING MONTHLY DAYLIGHT EFFORT BY LUFTWAFFE  
AGAINST UNITED KINGDOM AND SHIPPING IN HOME WATERS.**

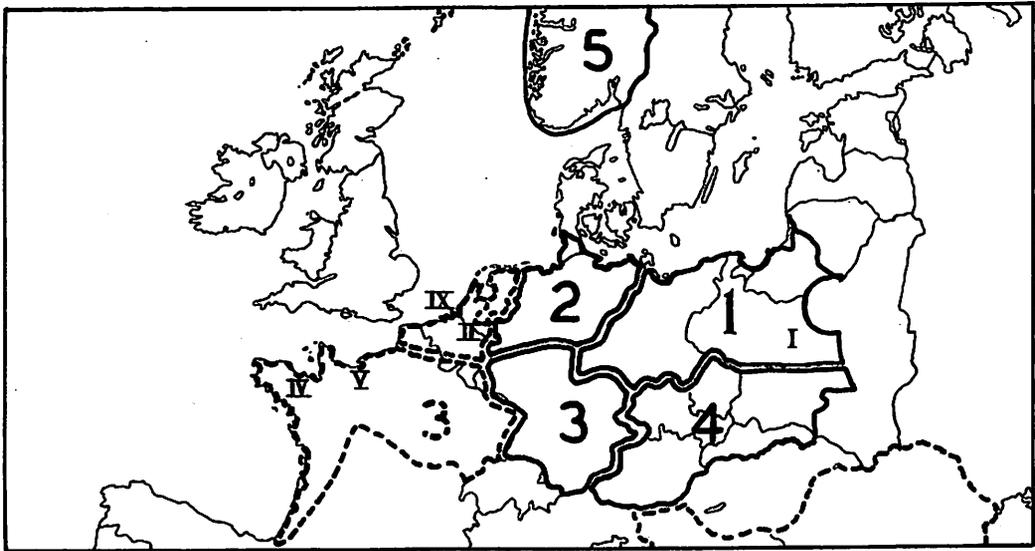


# OPERATIONAL AREAS OF LUFTWAFFE COMMANDS.

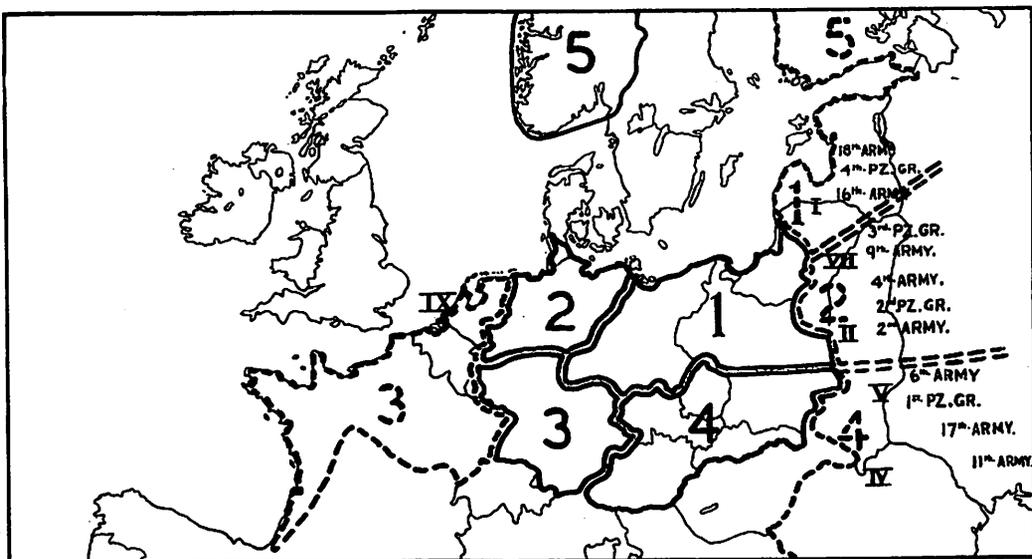
## 1. DURING BATTLE OF BRITAIN (AUGUST, 1940.)



## 2. AT END OF BALKAN CAMPAIGN (MAY, 1941.)



## 3. AT BEGINNING OF RUSSIAN CAMPAIGN (JUNE, 1941.)



KEY.

- BASIC LUFTFLOTTE BOUNDARIES.
- - - EXTENDED
- 2 LUFTFLOTTE.
- V FLIEGERKORPS.

COPY OF ORIGINAL INSTRUCTION ISSUED BY  
NO. 11 GROUP FOR "MOSQUITO" (LATER CALLED "RHUBARB")  
OPERATIONS.

MOST SECRET

To:- R.A.F. Station,  
TANMERE, KENLEY,  
BIGGIN HILL, HORNCHURCH,  
NORTH WEALD, NORTHOLF,  
DEBDEN.

Date:- 21st December, 1940.

Ref:- 11G/S. 500/39/0ps.

OFFENSIVE ACTION - "MOSQUITO" OPERATIONS

It would appear that the life of the Germans on the FRENCH and BELGIAN coasts is at present by day a comparatively easy one. They are seldom molested by offensive action on our part, and their aircraft are free to fly at will.

2. It is considered desirable to harass the Germans by daily "tip and run" operations, to make them feel that flying over NORTHERN FRANCE or BELGIUM is unsafe and so force them to some system of Readiness in order to protect themselves. If this is achieved, it will materially affect the morale of the German Air Force.

3. To achieve this object two types of operation are to be carried out:-

- (i) Offensive sweeps by large fighter forces, the fighters operating either alone or in company with one or more Bomber squadrons.
- (ii) "Mosquito" raids made by single fighters or by a number of fighters in company up to flight strength.

Instructions for large scale offensive sweeps are being issued separately, the following orders apply to the conduct of "Mosquito" raids only:-

4. On suitable days a selected flight in one Sector is to be "Released" for Mosquito raids. This flight is to be selected whenever possible from an Available Squadron. Each Sector is allotted in rotation one day per week on which they are, when the weather is suitable, to Release a flight for this purpose; a roster shewing the allocation of days in the week is attached. Should it be impossible due to weather or any other reason for a flight to operate on their selected day, their opportunity to do so will be lost for that week and the next named Sector will take over on the day following in accordance with the roster. In these circumstances a flight is not to be released, and the normal requisite state is to be maintained.

5. "Mosquito" raids are only to be undertaken when weather is suitable, that is when cloud cover is available to enable our fighters to fly in or above clouds, dart out from the clouds to attack hostile aircraft and return immediately into the clouds. These raids are not to be made when the cloud base is below 2,000 feet. If conditions are found to be unsuitable on approaching the FRENCH coast, the task is to be abandoned and aircraft are to return to Base.

6. When it is intended to carry out raids, the release of a flight is to be notified immediately to Group. In addition the Sector is to inform Group of:-

- (i) the area to be covered by the raid;
- (ii) the time of despatch;
- (iii) E.T.A. at the Coast on the outward journey;
- (iv) E.T.A. at the Coast on the return flight.

7. Should "Mosquito" raids fail to locate enemy aircraft in flight they may in favourable circumstances attack suitable ground objectives, but in no circumstances must other than GERMAN Military objectives be attacked.

8. The Squadron Commander of the Squadron which is to carry out a raid is to decide on the number of aircraft to be employed and on the detailed method of carrying out the operation. Only experienced pilots are to be detailed. They are not to take unnecessary risks and they are to be told that the object of these raids is to inflict the maximum casualties on the enemy without loss to themselves.

9. Strict R/T silence is to be maintained during the outward flight and whilst over occupied territory by aircraft engaged in these operations.

10. When returning from a sortie aircraft are to recross the English coast below 2,000 feet to facilitate recognition.

11. Should the weather become unfit to continue "Mosquito" raids at any time, raids are to be discontinued and the released flight is to revert to Normal State.

12. Intelligence concerning enemy activities, dispositions and A.A. defences in occupied Territory, will be notified periodically to Sectors so that the most suitable areas for raids can be selected.

(Signed) T. LEIGH-MALLORY,  
Air Vice-Marshal,  
Commanding, No.11 Group.

Copy to:- Headquarters, Fighter Command.

ROSTER FOR "MOSQUITO" OPERATIONS

(11G/S. 500/39/Ops. dated 21.12.40 refers)

| <u>SECTOR</u> | <u>DATE</u> |
|---------------|-------------|
| NORTH WEALD   | 22.12.40.   |
| TANGMERE      | 23.12.40.   |
| HORNCHURCH    | 24.12.40.   |
| NORTHOLT      | 25.12.40.   |
| DEBDEN        | 26.12.40.   |
| BIGGIN HILL   | 27.12.40.   |
| KENLEY        | 28.12.40.   |
| NORTH WEALD   | 29.12.40.   |
| TANGMERE      | 30.12.40.   |
| HORNCHURCH    | 31.12.40.   |
| NORTHOLT      | 1. 1.41.    |
| DEBDEN        | 2. 1.41.    |
| BIGGIN HILL   | 3. 1.41.    |
| KENLEY        | 4. 1.41.    |
| NORTH WEALD   | 5. 1.41.    |
| TANGMERE      | 6. 1.41.    |
| HORNCHURCH    | 7. 1.41.    |
| NORTHOLT      | 8. 1.41.    |
| DEBDEN        | 9. 1.41.    |
| BIGGIN HILL   | 10. 1.41.   |
| KENLEY        | 11. 1.41.   |
| NORTH WEALD   | 12. 1.41.   |

and continue in this sequence.

SECRET

Appendix (IV)B

COPY OF ORIGINAL INSTRUCTION ISSUED BY  
NO. 11 GROUP FOR "CIRCUS" OPERATIONS.

OPERATION INSTRUCTION NO. 1.

COPY NO. 49

DATE: 24th December, 1940.

FILE REF: 11G/S.500/13/Ops.

MAP REFERENCE: Aviation Map of Great Britain, Sheet 8,  
scale 1:500,000.  
Aviation Map of France, Sheet NM 30 SE,  
scale 1:500,000.

OFFENSIVE SWEEPS - "CIRCUS" OPERATIONS

INFORMATION

1. For some time past the German Air Forces in occupied territory have day by day been comparatively undisturbed by offensive action on our part.
2. The initiative has been entirely theirs, to be active as and when they pleased. We have been forced continuously to stand on the defensive prepared at any moment to meet attacks of the enemy's choosing.
3. The German Air Force has so far been defeated in major daylight engagements against this Country, but their morale has held because it has had opportunity to recuperate at rest in their bases, where it has been unnecessary for them to be constantly on the alert against possible counter attack.
4. Although there may not be many targets in occupied territory which are vital to the enemy, there are military establishments, concentration of supplies, and a number of aerodromes or landing grounds suitable for attack.

INTENTION

5. To take offensive action which will harass the enemy, force him to adopt defensive preparedness and enable our patrols to meet him in the air with the tactical advantages of height and surprise.

EXECUTION

6. Normally not less than six Fighter Squadrons will be employed with or without the co-operation of a small bomber force. Periodically, to carry out offensive sweeps over occupied territory with large fighter forces, the fighters operating on occasions in company with one or more Bomber Squadrons.

Role of Forces

7. The role of the Units in the combined force will be as follows:-

BOMBER FORCES

- (i) To bomb objectives which it is calculated the enemy will despatch aircraft to protect.

/HURRICANE

- (ii) HURRICANE WING  
To attack enemy aircraft sent up to drive off our attacking force. Should no enemy aircraft be encountered, the HURRICANES may, on occasions, come down low to attack targets on the ground.

- (iii) SPITFIRE WING  
To provide above cover for the remainder of the force.

#### Assembly of the Forces

8. Sectors will be detailed in turn to provide Wings to take part in these operations. Normally the whole of, or at least the leaders of the Bomber Force will arrive at the parent Station of the leading Wing before the force is due for despatch and will leave for the operation in visual contact with the Fighters.

The remainder of the force will join up in the air by pre-arranged rendezvous.

#### Detailed Plans for Offensive Sweep

9. Details of dispositions, methods of attack, and discussion regarding the best means of undertaking each individual operation will be considered at a conference which will be held before a sweep takes place.

#### Selection of Targets

10. A.O.C. No.11 Group in consultation with any Bomber or Coastal Command formations concerned, will select the targets after considering all the Intelligence information available.

#### Approach to the Target Area

11. The direction and method of approach will be decided at the conference referred to in para.9 above. Every endeavour will be made to achieve surprise by approaching down Sun and by taking practical advantage of the prevailing weather, and by varying the time of each operation.

#### Withdrawal after Attack

12. Additional cover for the withdrawal and return of our forces after the attack will be provided by forward fighter patrols in support.

13. A wing will be ordered to patrol mid-channel during the time an offensive sweep is in progress and until our forces have withdrawn.

#### COMMUNICATIONS

14. (i) All Squadrons in Debden, North Weald, Hornchurch and Biggin Hill Sectors are fitted with crystals of Group Guard 1 Frequency.

(ii) All Squadrons in Northolt, Kenley and Tangmere Sectors are fitted with crystals of Group Guard 11 Frequency.

(iii) The Squadrons forming a Circus will normally all be selected from the same Group of Stations and are to operate on their appropriate Group Guard Frequency.

(iv) All Stations concerned are to keep listening watch on their Group Guard Frequency and are also to be prepared to home aircraft on their Sector Homing Frequency as necessary. Pilots are to be instructed to change to the local homing frequency should they require homing facilities. Calls for assistance may be made on Group Guard Frequency in emergency only.

(v) Normally complete R/T silence is to be maintained on the Group Guard Frequency until immediately before the attack when the Wing Leader may issue any necessary instructions for the attack, get away, and dispersal.

(vi) One Sector Station will be detailed to act as a guard station.

(vii) Any orders which it may be necessary to pass to a Circus when airborne, from Group Controller, will be passed through the Guard Station.

(viii) Supporting formations to cover the withdrawal of the Wing will operate under normal Sector Control after being ordered off the ground by the Group Controller.

#### ADMINISTRATIVE

15. Previous orders for Offensive Sweeps issued under this Headquarters reference 11G/S. 500/13/Ops.1., dated 8th December, 1940, are hereby cancelled.

16. In future, Offensive Sweeps and other operations over enemy occupied territory, in which more than one Wing of Fighters is engaged are to be known as "CIRCUS" operations, and numbered consecutively, i.e., Circus 1., Circus 2.

17. Acknowledge.

(Signed) T. LEIGH-MALLORY  
Air Vice-Marshal, Commanding,  
No.11 Group, Royal Air Force.

#### DISTRIBUTION LIST ATTACHED

|                                   |          |
|-----------------------------------|----------|
| O.C., R.A.F. Station, Tangmere    | 6 copies |
| O.C., R.A.F. Station, Biggin Hill | 5 copies |
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| File                              | 1 copy   |
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Operation "Rhubarb": Summary of Patrols and Results,  
20th December 1940 to 13th June 1941

| Month            | No. of Patrols | No. of Sorties | No. of Patrols Abortive (1) | No. of times e/a seen in air | No. of e/a seen in air | No. of times e/a engaged in air (2) | No. of attacks on surface objectives (3) | No. of e/a claimed as destroyed * | No. of our Pilots lost # |
|------------------|----------------|----------------|-----------------------------|------------------------------|------------------------|-------------------------------------|--|-----------------------------------|--------------------------|
| 1940<br>December | 4              | 8              | 1                           | -                            | -                      | -                                   | 6  | -                                 | -                        |
| 1941<br>January  | 15             | 44             | 5                           | 3                            | 8                      | 1                                   | 21                                       | -                                 | 2                        |
| February         | 16             | 29             | 8                           | 2                            | 10                     | 1                                   | 12                                       | -                                 | 2                        |
| March            | 12             | 25             | 5                           | 1                            | 1                      | 1                                   | 4  | -                                 | -                        |
| April            | 41             | 95             | 8                           | 11                           | 32                     | 7                                   | 41                                       | 3                                 | 3                        |
| May              | 38             | 92             | 12                          | 7                            | 24                     | 6                                   | 20                                       | 3                                 | -                        |
| June (1st-13th)  | 23             | 43             | 6                           | 2                            | 2                      | 2                                   | 12                                       | 1                                 | 1                        |
|                  | 149            | 336            | 45                          | 26                           | 77                     | 18                                  | 116                                      | 7                                 | 8                        |

\* Figures based on "assessed" claims and losses as finally amended by H.Q.F.C.

Analysis of Attacks on Surface Objectives  
during this period

|                            | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | Total |
|----------------------------|------|------|------|------|------|-----|------|-------|
| Enemy a/c on ground        | -    | 1    | 4    | 1    | 6    | 3   | 2    | 17    |
| Aerodrome buildings etc.   | 3    | 2    | 3    | -    | 5    | 3   | -    | 16    |
| Gun and S/L posts          | -    | 3    | 3    | -    | 7    | 3   | 1    | 17    |
| Ships                      | -    | 7    | 2    | 2    | 4    | 6   | 4    | 25    |
| Troops, camps etc.         | 1    | 3    | -    | 1    | 7    | 3   | 1    | 16    |
| Road Vehicles              | 2    | 4    | -    | -    | 7    | 1   | 4    | 18    |
| Trains and railway system  | -    | 1    | -    | -    | 1    | -   | -    | 2     |
| Barges and canal system    | -    | -    | -    | -    | 2    | -   | -    | 2     |
| Electrical and gas systems | -    | -    | -    | -    | 1    | -   | -    | 1     |
| Factories, docks, storage  | -    | -    | -    | -    | 1    | 1   | -    | 2     |
| Totals                     | 6    | 21   | 12   | 4    | 41   | 20  | 12   | 116   |

(1) An abortive patrol was one in which the aircraft left the ground but were prevented by the weather or other circumstances from carrying out a "Rhubarb" patrol.

(2) For this purpose, firing by either side constitutes "engagement".

(3) Attacks on the same objective by two or more aircraft flying together have been treated as one attack.

COPY OF ORDER ISSUED BY NO. 11 GROUP  
FOR FIRST "CIRCUS" OPERATION

SECRET

OPERATION ORDER NO. 17.

COPY NO. 24

DATE: 26th December, 1940.

FILE REF: 11G/S. 500/13/Ops.

MAP REFERENCE:- Aviation Map of Great Britain,  
Sheet 8, scale 1:500,000

OPERATION ORDER FOR CIRCUS 1.

INFORMATION

1. There are known to be a number of enemy fighter squadrons operating from aerodromes behind the French Channel Ports. It is also probable that some of these are based at landing grounds around the FORET DE GUISE (50° 50' N, 1° 52' E). In addition the Germans have stored war material within the FORET DE GUISE where it is hidden by the trees.

INTENTION

2. To harass the enemy on the ground by bombing the FORET DE GUISE, to destroy enemy aircraft in the air or, should insufficient or no enemy aircraft be seen, to ground strafe ST. INGLEVERT aerodromes, with particular attention to aircraft grounded and petrol tankers.

EXECUTION

3. (i) The following Squadrons are detailed for operation Circus 1 to be carried out on Zero Day, which will be decided upon and communicated to all units taking part the evening before. Squadrons taking part are to be at "Readiness" at 0800 hours.

(ii) Zero Time is the time all Squadrons (except the Biggin Hill Squadrons detailed to cover the withdrawal of the offensive sweep) are to rendezvous over SOUTHEND PIER at 6,000 feet and set course for objectiveness.

(iii) Zero Time is to be notified by Group Controller to Sectors concerned (HORNCHURCH, NORTH WEALD, DEBDEN and BIGGIN HILL) at 0800 hours on Zero Day or such later time as weather conditions dictate.

(iv) Squadrons taking part in Circus 1 are to cross the French Coast between CALAIS and DUNKIRK at the following heights clouds permitting:-

Nos. 242 and 249 Squadrons - 10/11,000 feet.

No. 114 (BLENHELM) Squadron - 12,000 feet.

No. 56 Squadron - 12,500 feet.

Nos. 64, 611 and 41 Squadrons - Stepped up and back from 13,000 to 15,000 feet.

(v) The Blenheims of No. 114 Squadron are to arrive at HORNCHURCH on the afternoon of Zero minus one day, and remain there over night.

/ROLE

## ROLE OF SQUADRONS TAKING PART

### 4. (i) No.114 Squadron (BLENHEIMS)

Are to attack dispersal pens, stores and explosive dumps amongst the trees in the FORET DE GUISSNE as detailed and as shown in photographs already supplied to the Squadron Commander.

### (ii) No.56 Squadron

Are to act as close escort to No.114 Squadron (Blenheims) flying at 500 to 1,000 feet above the Blenheim Squadron throughout the attack and the subsequent withdrawal.

### (iii) Nos.242 and 249 Squadrons

Are to engage enemy aircraft in the air in the vicinity of ST. INGLEVERT aerodrome, or should insufficient or no enemy aircraft be seen, they are to ground straff ST. INGLEVERT aerodromes, paying particular attention to aircraft grounded and petrol tankers.

### (iv) Nos.64, 611 and 41 Squadrons

Are to act as Fighter Cover for the attacking Squadrons throughout, maintaining their heights between 10,000 and 15,000 feet, or at such other heights as ordered by the Wing Leader in accordance with the tactical situation. Squadrons are to be stepped up and back, No.41 Squadron on top, No.611 Squadron in the middle and No.64 Squadron, the leading Squadron, at the bottom. Nos.64 and 611 Squadrons are permitted to reduce height to attack enemy aircraft in the air, but No.41 Squadron is to act as above guard to the other Squadrons and only fight if forced to do so for the protection of the remainder.

### (v) Nos.74, 92 and 66 Squadrons

Are to maintain a patrol as a Wing off CAP GRIS NEZ from Zero Time plus 30 minutes to cover the withdrawal of the attacking Squadrons. The disposition of the Wing on patrol is to be as pre-arranged and detailed by the Wing Leader., (S.L. MALAN).

## COMMUNICATIONS

5. All Squadrons taking part in Circus 1, and in addition Hornchurch, North Weald and Debden Sector Operations Rooms, are to maintain listening watch on Group Guard Frequency No.1 (Channel C in aircraft) until after the initial attack has been delivered. Strict R/T silence is to be maintained throughout the assembly and approach. Contractor fixing is not to be used until after the attack. In emergency the Wing Leader may issue essential orders on Channel C before or during the initial attack, except to No.56 Squadron who are fitted with H/F. Should any change of plan require orders to be passed to the Wing, they are to be passed via Hornchurch, who will transmit them on Channel C to the Wing, except to No.56 Squadron who are fitted with H/F R/T. North Weald is to maintain a listening watch on No.56 Squadron frequency.

After recrossing the British Coast Squadrons are to revert to Channel A for operational messages and Channel B for homing. The Biggin Hill covering Squadrons are to operate on Channel A throughout under Sector Control. Manston is to maintain D/F watch on Group Guard Frequency (Channel C) for the purpose of providing emergency V.H.F. homing facilities if required.

WEATHER

WEATHER

6. (i) The Circus 1 is only to take place under favourable weather conditions of good visibility and cloud base not below 12,000 feet.

(ii) The Group Controller is to obtain from aerodromes concerned (HORNCHURCH, ROCHFORD, BIGGIN HILL, NORTH WEALD, and MARTLESHAM) an accurate weather report at 0700 hours and, thereafter, hourly on Zero Day.

TRAINING

7. The Officers Commanding Hornchurch and North Weald are to ensure that no opportunity is lost in carrying out whatever training they consider necessary prior to this operation. Squadrons must be conversant with operating in Wing formation and carrying out offensive tactics in large formations. In addition, the Hurricane Squadrons are to study and, if possible, practice attacks on ground targets. Similarly Spitfire Squadrons are to study and practice their duties as an escort.

ADMINISTRATIVE

8. No.11 Group Operation Order No.16 is hereby cancelled.

9. Acknowledge.

(Signed) T. LEIGH-MALLORY,  
Air Vice-Marshal, Commanding,  
No.11 Group, Royal Air Force.

Method of Issue and Time:-

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"CIRCUS" OPERATIONS, 10TH JANUARY TO 13TH JUNE, 1941.

| Circus No. | Date      | No. of A/C. | Squadron & Group Nos.       | Bombing Height. (Feet) | Target for Bombers.      | No. of Squadrons. | Squadron Nos. and Role.   | E/A Dest. (Claimed) * | Our Pilots Lost | Remarks   |
|------------|-----------|-------------|-----------------------------|------------------------|--------------------------|-------------------|---|-----------------------|-----------------|---|
| I          | 10.1.41   | 6           | 114 (2)                     | 6,800                  | Forêt de Guines          | 9                 | 56, 242, 249, 41, 64, 611 escort and cover; 66, 74, 92 supporting sweep.  | 2                     | -               | -   |
| -          | 2.2.41    | 5           | 139 (2)                     | 13,000                 | Boulogne Docks           | 6                 | 1, 303, 601, 66, 74, 92 escort and cover.   | 3                     | 1               | -   |
| II         | 5.2.41    | 12          | 114 (2)<br>139 (2)          | 7,000                  | Aerodrome, St. Omer/L.   | 9                 | 601, 302, 610, 65, 1, 615 escort and cover; 41, 64, 611 supporting sweep.   | 2                     | 6               | Misunderstanding  |
|            |           |             |                             |                        |                          | 5                 | 56, 249, 310, 257, 19 "mopping up"  | -                     | 1               | at rendezvous.  |
| III        | 10.2.41   | 6           | 139 (2)                     | 7/8,000                | Dunkirk Docks            | 3                 | 17, 56, 249 escort;   | 2                     | 1               | -   |
| IV         | 10.2.41   | 6           | 59 (16)                     | "                      | Boulogne Docks           | 2 $\frac{1}{2}$   | 1, 615, 605 "B" Flight escort;  | -                     | -               | -   |
|            |           |             |                             |                        |                          | 6                 | 66, 74, 92, 41, 611, 64, "mopping up" for III and IV  | -                     | -               | -   |
| V          | 10.2.41   | 6           | 59 (16)                     | 7/8,000                | Calais Docks             | 4                 | 303, 601, 46, 266 escort;   | -                     | 2               | -   |
|            |           |             |                             |                        |                          | (3)               | 41, 611, 64 to cover withdrawal   | -                     | -               | No sweep: insufficient e/a.   |
| VI         | 26.2.41   | 12          | 139 (2)                     | 17,000                 | Calais Docks             | 8                 | 1, 601, 303 escort; 74, 609, 92 high cover; 54, 64 "mopping up";  | -                     | 1               | -   |
|            |           |             |                             |                        |                          | 2                 | 249, 56 additional sweep  | -                     | -               | -   |
| VII        | 5.3.41    | 6           | 139 (2)                     | 16,500                 | Boulogne Docks           | 9                 | 601, 303 escort; 610, 616, 145 high cover; 54, 611, 92, 609 offensive sweep.  | 1                     | 4               | Rendezvous partially unsuccessful. Squadrons lost touch.                          |
| VIII       | 13.3.41   | 6           | 139 (2)                     | 15,000                 | Aerodrome, Calais/Marck  | 9                 | 56, 249, 303 escort; 54, 64, 611 sweep; 610, 145, 616 sweep.  | 1                     | 1               | Different timing  |
| IX         | 16.4.41   | 6           | 21 (2)                      | 10,000                 | Aerodrome, Berck-sur-Mer | 3                 | 306 close escort; 601, 303 escort   | 1                     | 2               | Escort squadrons persistently attacked going home.                                |
|            |           |             |                             |                        |                          | 2                 | 1, 615 sweep.   | -                     | -               |   |
| X          | 21.5.41   | 18          | 21 (2)<br>82 (2)<br>110 (2) | 12,000                 | Refinery, Gosnay         | 16                | 1, 258, 302 escort<br>56, 242, 609 diversion<br>303, 306, 145 diversion<br>92 high "Sphere";<br>54, 303, 611, 19, 310, 266 support. | 4                     | 6               | In addition, one Blenheim lost and one Me.109 claimed as destroyed by a Blenheim. |
| XI         | (21.5.41) | -           | -                           | -                      | -                        | -                 | -   | -                     | -               | Cancelled.  |
| TOTALS     |           | 89          |                             |                        |                          | 93 $\frac{1}{2}$  |   | 16                    | 25              |   |

\* Figures based on "assessed" claims and losses as finally amended by H.Q.F.C.

OPERATIONS WITH BOMBERS, OTHER THAN "CIRCUS":  
5th FEBRUARY to 13th JUNE, 1941.

| Class and Number | Bomber Force. |                     | Target                 | Fighter Force.       |                                       | E/A dest.<br>(claims) ✕ | Pilots<br>Lost ✕ |
|------------------|---------------|---------------------|------------------------|----------------------|---------------------------------------|-------------------------|------------------|
|                  | Date          | No. of<br>Aircraft. |                        | No. of<br>Squadrons. | Squadron Nos.                         |                         |                  |
| -                | 5.2.41.       | 5                   | Destroyers off Belgium | 3                    | 41, 64, 611.                          | -                       | -                |
| "Roadstead I"    | 25.2.41.      | 6                   | Ships off Dunkirk      | 8                    | 1, 303, 615, 54, 64, 611,<br>19, 310. | 3                       | 1                |
| "Roadstead II"   | 31.3.41.      | 6                   | Ships off Gris Nez     | 7                    | 56, 249, 1, 615, 303,<br>257, 266.    | -                       | -                |
| "Blot I"         | 17.4.41.      | 18                  | Cherbourg Docks        | 6                    | 145, 616, 610, 66, 234,<br>501.       | -                       | -                |
| "Blot II"        | 21.4.41.      | 17                  | Le Havre               | 3                    | 145, 616, 610.                        | -                       | 1                |
| "Roadstead"      | 28.4.41.      | 3                   | Small craft off Calais | $\frac{1}{2}$        | 74                                    | -                       | -                |
| "Roadstead"      | 29.4.41.      | 3                   | Ships off Ostend       | $1\frac{1}{2}$       | 74, 609.                              | -                       | 1                |
| "Roadstead"      | 3.5.41.       | 6                   | Ships off Gravelines   | 1                    | 74.                                   | -                       | -                |
| "Roadstead"      | 3.5.41.       | 6                   | Ships off Le Touquet   | 1                    | 74.                                   | -                       | -                |
| "Roadstead"      | 6.5.41.       | 3                   | Ships off Mardyck      | 1                    | 74.                                   | -                       | 2                |
| "Roadstead"      | 7.5.41.       | 5                   | Ships off Mardyck      | 3                    | 54, 611, 64.                          | 1                       | 1                |
| "Roadstead"      | 4.6.41.       | 6                   | Ships off Boulogne     | 6                    | 1, 92, 609, 54, 611, 303.             | 2                       | 1                |
| "Roadstead"      | 4.6.41.       | 6                   | Ships off Boulogne     | 2                    | 242, 91.                              | -                       | -                |
| "Roadstead"      | 5.6.41.       | 3                   | Ships off Ostend       | 3                    | 54, 611, 242.                         | -                       | -                |
| "Roadstead"      | 11.6.41.      | 5                   | Tanker off Dunkirk     | 3                    | 74, 609, 1.                           | -                       | 1                |
| "Roadstead"      | 12.6.41.      | 3                   | Ship off Gravelines    | 3                    | 74, 92, 611.                          | 1                       | -                |
| TOTALS           |               | 101                 |                        | 52                   |                                       | 7                       | 8                |

✕ Figures based on "assessed claims and losses as finally amended by H. Q. F. C.

Appendix (IV)G

Fighters Sweeps without Bombers, including Operation "Sphere":  
Summary of Patrols and Claims, 9th January to 13th June 1941.

| Month           | Patrols other than "Sphere" |                  | Operation "Sphere" |                  | Total No. of Patrols. | No. of times e/a seen. | No. of times e/a engaged. | No. of e/a claimed as destroyed. ✕ | No. of our pilots lost. ✕ |
|-----------------|-----------------------------|------------------|--------------------|------------------|-----------------------|------------------------|---------------------------|------------------------------------|---------------------------|
|                 | No. of Patrols.             | No. of Squadron. | No. of Patrols.    | No. of Aircraft. |                       |                        |                           |                                    |                           |
| 1941<br>January | 3                           | 7                | -                  | -                | 3                     | -                      | -                         | -                                  | -                         |
| February        | 8                           | 17               | 3                  | 14               | 11                    | 3                      | 2                         | -                                  | 2                         |
| March           | 8                           | 21½              | -                  | -                | 8                     | 4                      | 1                         | 3                                  | 1                         |
| April           | 10                          | 16               | 19                 | 110              | 29                    | 12                     | 8                         | 4                                  | 5                         |
| May             | 10                          | 13½              | 15                 | 84               | 25                    | 8                      | 6                         | 2                                  | -                         |
| June (1st-13th) | 3                           | 6                | 7                  | 52               | 10                    | 1                      | 1                         | -                                  | 1                         |
| Totals          | 42.                         | 81               | 44                 | 260              | 86                    | 28                     | 18                        | 9                                  | 9                         |

✕ Figures based on "assessed" claims and losses as finally amended by H. Q. F. C.

Day Offensive Operations not included in categories  
"Circus", "Roadstead", "Blot", "Sphere", "Rhubarb"  
or "Fighter Sweep" in which Combat Casualties  
were suffered or inflicted  
(same period)

| Date     | No. of Aircraft | Squadron Nos. | Description of Operation. | No. of e/a claimed as destroyed ✕ | No. of our Pilots lost. ✕ |
|----------|-----------------|---------------|---------------------------|-----------------------------------|---------------------------|
| 31.3.41. | 2               | 91            | Reconnaissance            | 1                                 | -                         |
| 11.4.41. | 11              | 91, 92        | Attack on seaplane        | 1                                 | 1                         |
| 21.4.41. | 2               | 91            | Reconnaissance            | 1                                 | -                         |
| 5.5.41.  | 1               | 145           | Reconnaissance            | 1                                 | -                         |
| 2.6.41.  | 2               | 601           | Reconnaissance            | 1                                 | -                         |
|          | 18              |               |                           | 5                                 | 1                         |

## SCHEDULE OF "CIRCUIS" OPERATIONS, 14th JUNE to 31st DECEMBER, 1941

| Circus No. | Date    | Bomber Force |         |                       | Target for Bombers                                     | No. of Sqdns. | Fighter Force  |     | E/A Dest. (Claimed) * | Our Pilots Lost #  | Remarks |
|------------|---------|--------------|---------|-----------------------|--|---------------|--|-----|-----------------------|--|---------|
|            |         | No. of A/C   | Gp. No. | Bombing Height (Feet) |  |               | Sq. Nos. and Role  |     |                       |  |         |
| XII        | 14.6.41 | 12           | 2       | 12,500                | Aerodrome, St. Omer/L.                                 | 8             | 1, 312, 303 escort wing; 54, 603 offensive patrol; 74, 92 offensive patrol; 145, 610, 616 (12 a/c) offensive patrol  | 3   | -                     | One Blenheim lost  |         |
| XIV        | 16.6.41 | 6            | 16      | Below 7,000           | Gas Works, Boulogne                                    | 8             | 258, 303, 306, escort wing; 54 high cover; 74, 92 offensive sweep; 603, 611 offensive sweep.   | 7   | 1                     | Blenheims split up; two lost   |         |
|            |         |              |         |                       |  | 1             | 1 and 91 (16 a/c) escort and cover to Air/Sea Rescue Lysander  | 4   | 2                     |  |         |
| XIII       | 17.6.41 | 18           | 2       | 10,500                | Chemical works and power station, Chocques nr. Béthune | 22            | 306, 56, 242 escort wing; 74, 609, 92 high cover; 603, 611, 54, 91, 303 forward echelon; 1, 258, 312 rear echelon; 145, 610, 616 flank; 308, 501 support wing; 19, 65, 266 support wing. | 15  | 9                     | Enemy fighters provided substantial opposition                             |         |
| XV         | 18.6.41 | 6            | 2       | 12,000                | Camp near Calais                                       | 16            | 1, 312, 258 escort wing; 303, 145, 616, 610 escort cover wing; 54, 611, 603 offensive sweep; 601 offensive patrol; 92, 609 support; 257, 310, 401 offensive patrol.                      | 10  | 4                     | -  |         |
| XVI        | 21.6.41 | 6            | 2       | 12,000                | Aerodromes, St. Omer                                   | 15            | 242, 306, 303 escort wing; 54, 603, 611 target support; 145, 610, 616 target support; 19, 65, 266, forward support   | 12  | -                     | Change of tactics; one Blenheim lost                                       |         |
|            |         |              |         |                       |  | 2             | 74, 92, 609 rear support; 312, 258 Channel patrol  | -   | -                     |  |         |
| XVII       | 21.6.41 | 6            | 2       | 12,000                | Aerodrome, Desvres                                     | 14            | 312, 1, 258 escort wing; 74, 609, 92 target support; 145, 610, 616 target support; 603, 611, 54 forward support; 56, 242 rear support;   | 15  | 2                     | Repeated morning's tactics   |         |
|            |         |              |         |                       |  | 3             | 266, 65, 19 Channel patrol   |     |                       |  |         |
| XVIII      | 22.6.41 | 12           | 2       | 12,000                | Marshalling yd., Hazebrouck                            | 16            | 56, 242, 303 escort wing; 603, 54, 611 target support; 616, 145, 610 target support; 92, 609, 74 forward support; 312, 258, 1, rear support; 601 rear support                            | 29  | 1                     | Blenheims destroyed an additional two e/a. Enemy seemed reluctant to fight |         |
| XIX        | 23.6.41 | 24           | 2       | 12,000                | Chemical Works and power station, Chocques             | 18            | 1, 258, 312, 303 escort wing; 616, 145, 610 target support; 74, 609, 92 target support; 611, 603, 54 forward support; 266, 19, 485 forward support; 71, 306 rear support                 | 7   | 2                     | -  |         |
|            | c/f     | 90           |         |                       |  | 123           |  | 102 | 21                    |  |         |

| Circus No.              | Date    | Bomber Force        |         |                       | Target for Bombers                              | Fighter Force |  | E/A Dest. (Claimed) # | Our Pilots Lost # | Remarks  |
|-------------------------|---------|---------------------|---------|-----------------------|---|---------------|--|-----------------------|-------------------|--|
|                         |         | No. of A/C          | Gp. No. | Bombing Height (Feet) |   | No. of Sqdns. | Sq. Nos. and Role  |                       |                   |  |
| B/F XX                  | 23.6.41 | 90<br>6             | 2       | -                     | Aerodrome, Mardyck (not reached)                | 123<br>14     | 242, 303 escort wing;<br>74, 609, 92 target support;<br>610, 616, 145 target support;<br>611, 54, 603 target support;<br>312, 258, 1 rear support  | 102<br>12             | 21<br>-           | Bomber formation was attacked and broken up; two Blenheims lost. |
| XXI                     | 24.6.41 | 17                  | 2       | 10,000                | Power Station, Comines near Lille               | 19            | 71, 308, 306, 303 escort wing;<br>54, 603, 611 cover;<br>616, 610, 145 target support;<br>74, 92, 609 target support;<br>19, 65, 222, 1, 258, 312 forward and rear diversion and cover                     | 9                     | 2                 | -  |
| XXII                    | 25.6.41 | 12                  | 2       | 7,000                 | Marshalling yd. Hazebrouck                      | 16            | 1, 258, 312 escort wing;<br>303 high cover;<br>74, 92, 609 extra high cover;<br>54, 603, 611 target support;<br>616, 610, 145 forward support;<br>3, 242, 71 rear support;                                 | 7                     | 2                 | -  |
| XXIII                   | 25.6.41 | 12                  | 2       | 6,000                 | Aerodrome, St. Omer/L.                          | 19            | 3, 71, 242 escort wing;<br>303 high cover;<br>54, 603, 611 extra high cover;<br>145, 610, 616 target support;<br>74, 92, 609 target support;<br>19, 266, 485 forward support;<br>1, 258, 312 rear support. | 6                     | 4                 | One Blenheim lost (Flak)   |
| XXIV                    | 26.6.41 | 23                  | 2       | -                     | Power Station, Comines near Lille (Not reached) | 19            | 308, 3, 303, 306 escort wing;<br>54, 603, 611 cover;<br>145, 610, 616 target support;<br>74, 92, 609 target support;<br>65, 222, 485, 1, 258, 312 forward and rear diversion and cover                     | 9                     | 3                 | Cloudy; bombers turned back                                      |
| XXV                     | 27.6.41 | 24                  | 2       | 12,000                | Fives-Lille Steel Works, Lille                  | 19            | 71, 306, 303, 308 escort wing;<br>74, 609 cover;<br>92 extra high cover;<br>603, 54, 611 target support;<br>145, 610, 616 target support;<br>19, 65, 286, 41, 258, 1 forward and rear diversion and cover  | 4                     | 4                 | Few engagements  |
| XXVI                    | 28.6.41 | 23                  | 2       | 7,000 to 8,000        | Power Station, Comines near Lille               | 19            | 3, 303, 306, 308 escort wing;<br>145, 610, 616 cover;<br>54, 603, 611 target support;<br>74, 92, 609 target support;<br>19, 222, 485, 1, 258, 312 forward and rear diversion and cover                     | 6                     | 2                 | Few engagements. Figures include one a/c destroyed on ground     |
| XXVII                   | 30.6.41 | 18                  | 2       | 6,000                 | Power Station, Pont-à-Vendin near Lens          | 19            | 303, 306, 308, 242 escort wing;<br>54, 603, 611, 74, 92, 609 target support;<br>1, 258, 312, 145, 610, 616, 65, 266, 485 diversion and rear support  | 6                     | 1                 | "Nibbling" tactics by enemy                                      |
| Totals 14th - 30th June |         | 225 (16 operations) |         |                       |   | 267           |  | 164                   | 39                |  |

| Circus No. | Date   | Bomber Force |         | Bombing Height (Feet) | Target for Bombers  | Fighter Force |  | E/A Dest. (Claimed) * | Our Pilots Lost * | Remarks   |
|------------|--------|--------------|---------|-----------------------|---|---------------|--|-----------------------|-------------------|---|
|            |        | No. of A/C   | Gp. No. |                       |   | No. of Sqdns. | Sq. Nos. and Role  |                       |                   |   |
| XXVIII     | 1.7.41 | 12           | 2       | -                     | Chemical Works and Power Station, Chocques (not reached)  | 12            | 303, 306, 308 escort wing; 54, 611, 603 target support; 145, 610, 616 target support; 1, 258, 312 rear support   | -                     | -                 | Fog and haze up to 10,000 feet  |
| XXIX       | 2.7.41 | 12           | 2       | -                     | Power Station, Lille (not attacked)   | 12            | 71, 303, 308 escort wing; 74, 92, 609 cover; 145, 610, 616 target support; 242, 258, 312 rear support  | 19                    | 8                 | Haze. Heavy fighter opposition. Two Blenheims lost; two e/s claimed as destroyed by Blenheims |
| XXX        | 3.7.41 | 6            | 2       | -                     | Marshalling yd., Hazebrouck (not attacked)  | 16            | 303, 306, 308, 71 escort wing; 145, 610, 616 cover; 54, 603, 611 target support; 74, 92, 609 target support; 258, 312, 485 rear support                              | 5                     | 3                 | Sun-glare hid target landmark. One Blenheim lost.   |
| XXXI       | 3.7.41 | 6            | 2       | 10,000                | Marshalling yd., Hazebrouck   | 17            | 258, 312, 485 escort wing; 54, 603, 611 cover; 145, 610, 616 target support; 74, 92, 609 target support; 257, 266, 401 rear support; 303, 308 independent            | 7                     | 3                 | -   |
| XXXII      | 4.7.41 | 12<br>12     | 2<br>16 | 8,000                 | Chemical Works and Power Station Chocques and Marshalling yard, Abbeville (latter not attacked) | 18            | 71, 242, 74, 92, 609 escort Chocques; 258, 312, 485, 308 escort Abbeville; 54, 603, 611, 145, 610, 616 target support; 56, 65, 601 rear support                      | 15                    | 3                 | Bombers for Abbeville did not find escort. One Blenheim lost                                  |
| XXXIII     | 5.7.41 | 3<br>1       | 3<br>3  | 12,000<br>8,000       | Fives-Lille Steel Works, Lille and Marshalling yard, Abbeville                                  | 19            | 258, 312, 485, 308 escort Lille; 242, 71, 222 escort Abbeville (diversion); 74, 92, 609, 145, 610, 616 target support; 19, 257, 401 rear support; 54, 603, 611 cover | 2                     | 2                 | First use of Stirlings  |
| XXXIV      | 6.7.41 | 3            | 3       | 8,000                 | Shipyard, Le Trait and Power Station nearby at Yainville (both near Rouen)                      | 6             | 258, 312, 485, 303 escort wing; 145, 616 rear support  | -                     | -                 | Same formation of Stirlings attacked both targets. Little opposition                          |
| XXXV       | 6.7.41 | 6            | 3       | 14,000                | Fives-Lille Steel Works, Lille  | 18            | 222, 71, 242, 306 escort wing; 92, 609, 74 cover; 54, 603, 611, 145, 610, 616, 303, 308 target support; 56, 65, 601 rear support                                     | 11                    | 6                 | Stirlings   |
| XXXVI      | 7.7.41 | 1            | 3       | 8,000                 | Marshalling yard, Hazebrouck  | 11            | 71, 242, 222 escort wing; 303, 308 cover; 54, 603, 611 target support; 19, 257, 401 rear support   | 2                     | -                 | Diversion for "Circus XXXVII"; drew enemy fighters to Lille area                              |
| XXXVII     | 7.7.41 | 4            | 3       | 8,000                 | Aircraft factory, Meaulte   | 9             | 258, 312, 485 escort wing; 74, 92, 609 cover; 145, 610, 616 target support   | 2                     | -                 | -   |
| XXXVIII    | 7.7.41 | 3            | 3       | 9,600                 | Chemical Works and Power Station Chocques   | 14            | 258, 312, 485 escort wing; 145, 610, 616 cover; 303, 308, 74, 92, 609 target support; 54, 603, 611 mopping up  | 4                     | 1                 | -   |
| c/f        |        | 81           |         |                       |   | 152           |  | 67                    | 26                |   |

| Circus No. | Date    | Bomber Force |         | Bombing Height (Feet)   | Target for Bombers  | Fighter Force |   | E/A Dest. (Claimed) * | Our Pilots Lost * | Remarks  |
|------------|---------|--------------|---------|-------------------------|---|---------------|---|-----------------------|-------------------|--|
|            |         | No. of A/C   | GP. No. |                         |   | No. of Sqdns. | Sq. Nos. and Role   |                       |                   |  |
| B/F XXXIX  | 8.7.41  | 81<br>3      | 3       | 7,800                   | Industrial plants<br>Lens and<br>Mazingarbe   | 152<br>13     | 258, 312, 485 escort wing;<br>92, 609 cover;<br>54, 603, 611, 145, 610, 616<br>target support;<br>222, 306 rear support   | 67<br>8               | 26<br>3           | One Stirling lost  |
| XL         | 8.7.41  | 3            | 3       | 14,000                  | Chemical Works and<br>Power Station,<br>Chocques and Power<br>Station, Lille                      | 19            | 71, 242, 222 escort wing;<br>303, 308 cover;<br>54, 603, 611, 145, 610, 616<br>target support;<br>56, 65, 601 diversion;<br>258, 312, 485 rear support;<br>92, 609 mopping up | 12                    | 7                 | -  |
| XLI        | 9.7.41  | 3            | 3       | 12,900                  | Industrial Plant,<br>Mazingarbe (not<br>attacked; attack on<br>Power Station,<br>Béthune)         | 16            | 258, 312, 485 escort wing;<br>145, 610, 616 cover;<br>54, 603, 611, 92, 609, 303<br>308 target support;<br>71, 242, 306 rear support  | 11                    | 7                 | Another e/a claimed by<br>a Stirling and yet<br>another by Air/Sea<br>Rescue escort. E/a<br>seen patrolling very<br>high |
| XLII       | 10.7.41 | 3            | 3       | 12,300<br>and<br>14,000 | Chemical Works and<br>Power Station,<br>Chocques  | 17            | 71, 242, 222 escort wing;<br>303, 308 cover;<br>72, 92, 609 high cover;<br>54, 611, 603, 145, 610, 616<br>target support;<br>312, 485, 306 rear support                       | 11                    | 7                 | One Stirling lost<br>(Flak)  |
| XLIII      | 11.7.41 | 3            | 3       | 10,000                  | Shipyard, Le Trait<br>and Power Station,<br>Yainville   | 6             | 312, 602, 485, 303 escort<br>wing;<br>610, 616 rear support   | -                     | -                 | Only a few e/a seen  |
| XLIV       | 11.7.41 | 1            | 60      | -                       | (Biggin Hill to<br>Manston)   | 8             | 72, 92, 609, 485, 602, 65,<br>266, 452 fighter sweeps   | 7                     | 3                 | Diversion prior to<br>"Circus XLV";<br>Blenheim used<br>"broad I.F.F." to<br>draw up e/a                                 |
| XLV        | 11.7.41 | 3            | 3       | 13,000                  | Fives-Lille Steel<br>Works, Lille (not<br>attacked; attack on<br>Marshalling Yard,<br>Hazebrouck) | 13            | 71, 242, 306 escort wing;<br>303, 308 cover;<br>54, 611, 603 target support;<br>145, 610, 616 target support;<br>222, 310 rear support  | 3                     | 2                 | Little opposition  |
| XLVI       | 12.7.41 | 3            | 3       | 12,000                  | Ship lift, Arques<br>near St. Omer  | 16            | 312, 485, 602 escort wing;<br>54, 603, 611 cover;<br>303, 308, 145, 610, 616<br>target support;<br>19, 56, 257 forward support;<br>306, 242 rear support                      | 5                     | 2                 |  |
| XLVII      | 12.7.41 | 1            | 60      | -                       | (Southend to<br>N. Foreland)  | 7             | 485, 602, 303, 308, 72, 92,<br>609 fighter sweeps   | 1                     | -                 | Independent<br>"diversion";<br>Blenheim used<br>"broad I.F.F."   |
| XLVIII     | 14.7.41 | 6            | 2       | 10,000                  | Marshalling yard,<br>Hazebrouck   | 16            | 71, 242, 222 escort wing;<br>54, 603, 611 cover;<br>72, 92, 609, 145, 610, 616<br>target support;<br>485, 602 forward support;<br>258, 312 rear support                       | 5                     | 4                 | Blenheims  |
| XLIX       | -       | -            | -       | -                       | -   | -             | -   | -                     | -                 | Cancelled  |
| L          | -       | -            | -       | -                       | -   | -             | -   | -                     | -                 | Cancelled  |
| LI         | 19.7.41 | 3            | 3       | 14,000                  | Power Station,<br>Lille (not<br>attacked; attack<br>on docks, Dunkirk)                            | 17            | 3, 71, 222 escort wing;<br>54, 603, 611 cover;<br>72, 92, 609, 145, 610, 616,<br>306, 308 target support;<br>485, 602 forward support;<br>312 rear support                    | 3                     | 2                 | Cloudy. One Stirling<br>lost (prob. Flak)  |
| C/F        |         | 113          |         |                         |   | 300           |   | 133                   | 63                |  |

| Circus No.                    | Date    | Bomber Force |                 | Bombing Height (Feet) | Target for Bombers   | Fighter Force |  | E/A Dest. (Claimed) * | Our Pilots Lost * | Remarks                                     |
|-------------------------------|---------|--------------|-----------------|-----------------------|--|---------------|--|-----------------------|-------------------|---|
|                               |         | No. of A/C   | Gp. No.         |                       |  | No. of Sqdns. | Sq. Nos. and Role  |                       |                   |   |
| B/F LII                       | 20.7.41 | 113<br>3     | 3               | -                     | Marshalling yd. Hazebrouck (not attacked)                        | 300<br>15     | 485, 602, 71 escort wing; 72, 92, 609 cover; 54, 603, 611, 145, 610, 616 target support; 306, 308 forward support; 3 rear support                            | 133<br>1              | 63<br>-           | Cloudy, Bombs jettisoned in sea             |
| LIII                          | -       | -            | -               | -                     | -  | -             | -  | -                     | -                 | Cancelled                                   |
| LIV                           | 21.7.41 | 3            | 3               | 15,000                | Accumulator Factory, Lille                                       | 15            | 485, 602, 71 escort wing; 72, 92, 609 cover; 54, 603, 611, 145, 610, 616 target support; 306, 308 forward support; 3 rear support                            | 8                     | 3                 | -   |
| LV                            | 21.7.41 | 3            | 3               | -                     | Industrial plant, Mazingarbe (not attacked)                      | 15            | 71, 111, 306 escort wing; 54, 603, 611 cover; 72, 92, 609, 145, 610, 616 target support; 19, 65, 266 forward support;  | 1                     | 3                 | Cloudy. No bombing                          |
| LVI                           | -       | -            | -               | -                     | -  | -             | -  | -                     | -                 | Cancelled                                   |
| LVII                          | 22.7.41 | 6            | 2               | 10,000                | Shipyard, Le Trait   | 6             | 610, 616, 145 escort wing; 602, 485, 452 target support  | -                     | -                 | No e/a seen                                 |
| LVIII                         | 22.7.41 | -            | -               | -                     | -  | 8             | 72, 92, 609, 54, 603, 611, 306, 308 fighter sweeps   | 4                     | 3                 | Diversion for "Circus LVII". Wings split up |
| LIX                           | 23.7.41 | 6            | 2               | 12,000                | Ammo. dumps, Forêt d'Eperlecques                                 | 14            | 71, 111, 222 escort wing; 609, 92, 72 cover; 452, 485, 602, 306, 308, 603, 611, 54 target support  | 3                     | 4                 | -   |
| LX                            | 23.7.41 | 6            | 2               | 12,000                | Industrial Plant Mazingarbe                                      | 17            | 71, 111, 222 escort wing; 54, 603, 611 cover; 145, 610, 616, 72, 92, 609 target support; 266, 601, 401 forward support; 452, 485 rear support                | 6                     | 4                 | One Blenheim crash-landed; crew unhurt      |
| LXI                           | 24.7.41 | 9            | 16              | 12,000                | Marshalling yard, Hazebrouck                                     | 14            | 71, 111, 222 escort wing; 306, 308 cover; 54, 603, 611, 72, 92, 609, 65, 257, 401 target support   | 5                     | 4                 | Diversion for "Sunrise"                     |
| Totals July                   |         | 149          | (30 operations) |                       |  | 404           |  | 161                   | 84                |   |
| Totals 14th June to 31st July |         | 374          | (46 operations) |                       |  | 671           |  | 322                   | 123               |   |
| LXIII                         | -       | -            | -               | -                     | -  | -             | -  | -                     | -                 | Cancelled                                   |
| LXIV                          | -       | -            | -               | -                     | -  | -             | -  | -                     | -                 | Cancelled                                   |
| LXV                           | 5.8.41  | 6            | 2               | -                     | Aerodrome, St. Omer/L. (not attacked)                            | 9             | 452, 485, 602 escort wing; 72, 92, 609 cover; 403, 603, 611 target support   | -                     | 1                 | Cloudy                                      |
| LXVI                          | -       | -            | -               | -                     | -  | -             | -  | -                     | -                 | Cancelled                                   |
| -                             | 6.8.41  | 6            | 2               | -                     | Aerodrome, Berck (not attacked)                                  | 5             | 72, 609, 92 escort wing; 452, 485 withdrawal cover   | -                     | -                 | Bad weather                                 |
| LXVII                         | 7.8.41  | 6            | 2               | 13,000                | Aerodrome, St. Omer/L  | 12            | 452, 485, 602 escort wing; 72, 92, 609 cover; 403, 603, 611 target support; 306, 308, 315 mopping up   | 3                     | 4                 | -   |
| LXII                          | 7.8.41  | 6            | 2               | 12,000                | Power Station, Lille (not attacked; attack on canal, Gravelines) | 20            | 71, 111, 222 escort wing; 452, 485, 602 cover; 72, 92, 609, 403, 603, 611, 41, 610, 616 target support; 306, 308 forward support; 19, 257, 401 rear support; | 3                     | 6                 | -   |
| LXVIII                        | 9.8.41  | 5            | 2               | -                     | Power Station, Gosney near Bethune (not found)                   | 15            | 71, 222, 111 escort wing; 403, 603, 611 cover; 485, 602, 452, 610, 616, 41 target support; 306, 308, 315 support;  | 11                    | 5                 | Cloudy                                      |
| c/f                           |         | 29           |                 |                       |  | 61            |  | 17                    | 16                |   |

| Circus No. | Bomber Force |            |         | Bombing Height (Feet) | Target for Bombers   | No. of Sqdns | Fighter Force   |         | E/A Dest. (Claimed) * | Our Pilots Lost *   | Remarks |
|------------|--------------|------------|---------|-----------------------|--|--------------|---|---------|-----------------------|---|---------|
|            | Date         | No. of A/C | Gp. No. |                       |  |              | Sq. Nos. and Role   |         |                       |   |         |
| B/F LXXIX  | 12.8.41      | 29<br>6    | 5       | 11,000                | Aerodrome, St. Omer/L. (not attacked; attack on railway)                     | 61<br>7      | 71, 111 escort wing;<br>54, 222 cover;<br>403, 603, 611 target support  | 17<br>3 | 16<br>1               | Hampdens. Cloudy. Diversion for op. against Cologne ("Operation 77")                  |         |
| LXX        | 12.8.41      | 6          | 5       | 14,500                | Power Station, Gosnay  | 12           | 306, 308, 315 escort wing;<br>72, 92, 609 cover;<br>452, 485, 602, 41, 610, 616 Target support.   | -       | 2                     | Hampdens. Diversion for op. against Cologne   |         |
| LXXI       | 12.8.41      | 6          | 2       | 7,000                 | Shipyard, Le Trait   | 5            | 452, 485, 602 escort wing;<br>41, 616 cover.  | 1       | 1                     | -   |         |
| LXXII      | 14.8.41      | 12         | 2       | 12,000                | "E" boats at Boulogne  | 12           | 452, 485, 602 escort wing;<br>72, 92, 609 cover;<br>403, 603, 611, 41, 610, 616 support   | 2       | 2                     | -   |         |
| LXXIII     | 14.8.41      | 6          | 2       | -                     | Shell factory, Marquise (not attacked)                                       | 12           | 71, 111, 222 escort wing;<br>403, 603, 611 cover;<br>306, 308, 315, 72, 92, 609 support   | 14      | 4                     | Cloudy. Strong enemy reaction   |         |
| LXXIV      | 16.8.41      | 6          | 2       | 10,000                | Shell factory, Marquise  | 15           | 71, 111, 222 escort wing;<br>403, 603, 611 cover;<br>306, 308, 315, 72, 92, 609 support;<br>452, 602, 485 mopping up  | 6       | 2                     | -   |         |
| LXXV       | 16.8.41      | 6          | 2       | 12,000                | Aerodrome, St. Omer/L.   | 15           | 452, 485, 602 escort wing;<br>72, 92, 609 cover;<br>41, 610, 616, 306, 308, 315 target support;<br>403, 603, 611 forward support                              | 11      | 1                     | Perfect weather   |         |
| LXXVI      | 17.8.41      | 6          | 2       | -                     | Docks, Le Havre (not reached)  | 5            | 41, 610, 616 escort wing;<br>308, 315 cover   | -       | -                     | Op. not completed   |         |
| LXXVII     | -            | -          | -       | -                     | -  | -            | -   | -       | -                     | Cancelled   |         |
| LXXVIII    | 18.8.41      | 9          | 2       | 8,000                 | Fives-Lille Steel Works, Lille   | 18           | 71, 111, 222 escort wing;<br>403, 603, 611 cover;<br>72, 92, 609, 41, 616, 610 target support;<br>452, 485, 602 withdrawal cover;<br>56, 65, 121 rear support | 1       | 3                     | -   |         |
| LXXIX      | -            | -          | -       | -                     | -  | -            | -   | -       | -                     | Cancelled   |         |
| LXXX       | 18.8.41      | 5          | 2       | 10,000                | Shell factory, Marquise  | 12           | 306, 308, 315 escort wing;<br>485, 602, 452 cover;<br>603, 611, 403 target support;<br>609, 72, 92 rear support   | 2       | -                     | -   |         |
| LXXXI      | 19.8.41      | 6          | 2       | -                     | Power Station, Gosnay (not attacked)   | 15           | 41, 610, 616 escort wing;<br>452, 485, 602 cover;<br>306, 308, 315, 403, 603, 611 target support;<br>72, 92, 609 rear support                                 | 11      | 4                     | Artificial leg for W/Cdr. Bader dropped by parachute. Weather deteriorated, no attack |         |
| LXXXII     | 19.8.41      | 6          | 2       | 12,000                | Marshalling yard, Hazebrouck   | 15           | 71, 111, 222 escort wing;<br>306, 308, 315 cover;<br>41, 610, 616, 403, 603, 611 target support;<br>72, 92, 609 rear support                                  | 8       | 6                     | -   |         |
| LXXXIII    | 21.8.41      | 6          | 2       | 12,500                | Chemical Works and Power Station, Chocques (not attacked; attack on railway) | 17           | 71, 602, 485 escort wing;<br>72, 92, 609 cover;<br>403, 603, 611, 41, 610, 616, 111, 222 target support;<br>306, 308, 315 rear support                        | -       | 3                     | Cloudy. Six e/a claimed as probably destroyed.  |         |
| LXXXIV     | 21.8.41      | 6          | 2       | 13,000                | Chemical Works and Power Station, Chocques                                   | 18           | 71, 111, 222 escort wing;<br>403, 603, 611 cover;<br>72, 92, 609, 41, 610, 616, 306, 308, 315 target support;<br>121, 401, 65 rear support                    | 2       | 8                     | Several e/a claimed as probably destroyed   |         |
| C/F        |              | 121        |         |                       |  | 239          |   | 78      | 53                    |   |         |

| Circus No.                      | Bomber Force |                     |         | Bombing Height (Feet) | Target for Bombers   | Fighter Force |  | E/A Dest. (Claimed) ✕ | Our Pilots Lost ✕ | Remarks  |
|---------------------------------|--------------|---------------------|---------|-----------------------|--|---------------|--|-----------------------|-------------------|--|
|                                 | Date         | No. of A/C          | Gp. No. |                       |  | No. of Sqdns. | Sq. Nos. and Role  |                       |                   |  |
| B/F LXXXVII                     | 26.8.41      | 121<br>6            | 2       | 12,000                | Aerodrome, St. Omer/L.                                     | 239<br>16     | 452, 485, 602 escort wing; 72, 92, 609 cover; 41, 610, 616, 54, 603, 611 target support; 306, 315 forward support; 71, 222 rear support                              | 78<br>3               | 53<br>2           | -  |
| LXXXV                           | 27.8.41      | 5                   | 2       | -                     | Aerodrome, St. Omer/L. (not attacked)                      | 12            | 306, 308, 315 escort wing; 452, 485, 602 cover; 41, 610, 616, 72, 92, 609 target support   | 6                     | 6                 | Diversion for "Circus LXXXVI" an hour later. Rendezvous missed; fighters swept without bombers                               |
| LXXXVI                          | 27.8.41      | 12                  | 2       | -                     | Power Station, Lille (not attacked)                        | 11            | 71, 111, 222, 402 escort wing; 54, 403, 603, 611 cover; 65, 121, 257 rear support  | 4                     | 4                 | Bombers failed to make landfall where planned and did not locate target  |
| LXXXVIII                        | 29.8.41      | 6                   | 2       | 13,000                | Marshalling yard, Hazebrouck (attacked with one bomb only) | 16            | 452, 485, 602 escort wing; 306, 308, 315 cover; 54, 603, 611, 72, 92, 609 71, 111, 222 support; 402 rear support   | 8                     | 5                 | All bombs except one dropped prematurely because of damage to leading a/c.   |
| LXXXIX                          | -            | -                   | -       | -                     | -  | -             | -  | -                     | -                 | -  |
| XC                              | 31.8.41      | 6                   | 2       | 12,000                | Aerodrome, St. Omer/L. (not attacked)                      | 12            | As for LXXXV, but without 610 and with addition of 242 covering withdrawal   | 1                     | -                 | Repetition of LXXXV. Target again not attacked, this time because of haze  |
| XCI                             | 31.8.41      | 12                  | 2       | 14,000                | Power Station, Lille                                       | 10            | 71, 111, 222 escort wing; 54, 603, 611 cover; 56, 65, 121 rear support   | -                     | 1                 | -  |
| XCII                            | 31.8.41      | 6                   | 2       | 8,500                 | Shipyard, Le Trait   | 5             | 41, 129, 616 escort wing; 452, 602 rear support  | -                     | 1                 | -  |
| TOTALS, Aug.                    |              | 174 (26 operations) |         |                       |  | 21            |  | 100                   | 72                |  |
| TOTALS 14th June to 31st August |              | 548 (72 operations) |         |                       |  | 392           |  | 422                   | 195               |  |
| XCIII                           | 4.9.41       | 12                  | 2       | 13,000                | Power Station, Mazingarbe                                  | 19            | 71, 111, 222, 402 escort wing; 72, 92, 609 cover; 485, 452, 602, 622, 54, 603 target support; 315, 306, 308 forward support; 41, 129, 616 rear support               | 8                     | 6                 | -  |
| XCIV                            | -            | -                   | -       | -                     | -  | -             | -  | -                     | -                 | Cancelled  |
| XCv                             | 17.9.41      | 23                  | 2       | 12,000                | Power Station, Mazingarbe                                  | 22            | 402, 71, 111, 222 escort wing; 306, 308, 315, 72, 92, 609 cover; 452, 485, 602, 54, 603, 611 target support; 41, 129, 616 forward support 56, 266, 601 rear support. | 8                     | 8                 | Also 2 e/a destroyed on A/S Rescue Op.   |
|                                 |              | 1                   | 2       |                       | (Blenheim flashing I.F.F.)                                 | 3             | 615, 403, 607 diversion  | -                     | -                 | Successful   |
| XCVI                            | 17.9.41      | 6                   | 5       | -                     | Shell factory, Marquise (not attacked)                     | 18            | 71, 111, 222 escort wing; 54, 603, 611 and 452, 485, 602, 123 (36 a/c) cover; 72, 92, 609, 41, 129, 616 target support; 601, 56, 266 sweep                           | 2                     | 1                 | Hampdens. Target not found   |
| XCvII                           | 18.9.41      | 6                   | 5       | -                     | Marshalling yard, Abbeville (not attacked)                 | 17            | 402, 607, 41, 129, 616 escort wing; 306, 308, 315 cover; 111, 71, 222, 611, 54, 603 target support; 266, 56, 601 forward support                                     | 2                     | 1                 | Hampdens. Escort cover wing and part of escort wing mistakenly went with Blenheims on "Circus XCIX". Hampdens abandoned task |
| XCvIII                          | -            | -                   | -       | -                     | -  | -             | -  | -                     | -                 | Cancelled  |
| C/F                             |              | 48                  |         |                       |  | 79            |  | 20                    | 16                |  |

| Circus No.                        | Bomber Force |                     |         | Bombing Height (Feet) | Target for Bombers  | Fighter Force |  | E/A Dest. (Claimed) # | Our Pilots Lost # | Remarks   |
|-----------------------------------|--------------|---------------------|---------|-----------------------|---|---------------|--|-----------------------|-------------------|---|
|                                   | Date         | No. of A/C          | Gp. No. |                       |   | No. of Sqdns. | Sq. Nos. and Roles   |                       |                   |   |
| B/F<br>XCIX                       | 18.9.41      | 48<br>11            | 2       | 10,000                | Power Station, Rouen  | 79<br>6       | 452, 485, 602 escort wing;<br>72, 92, 609 cover  | 20<br>5               | 16<br>5           | Some confusion with "Circus XCVII"  |
| 100A                              | 20.9.41      | 3                   | 2       | 14,000                | Marshalling yard, Hazebrouck  | 9             | 611, 54, 603 escort wing;<br>71, 111, 222 cover;<br>266, 411, 401 support  | 1                     | 3                 | Strong fighter opposition   |
| (Arabic numbering adopted)        |              |                     |         |                       |   |               |  |                       |                   |   |
| 100B                              | 20.9.41      | 6                   | 5       | 14,000                | Marshalling yard, Abbeville   | 7             | 72, 609, 92, 607 escort wing;<br>452, 602, 485 cover   | 7                     | 4                 | Co-ordinated with 100 A and C   |
| 100C                              | 20.9.41      | 12                  | 2       | 14,000                | Shipyard, Rouen   | 7             | 41, 129, 616, 402 escort wing;<br>306, 308, 315 cover  | 6                     | -                 | Half bomber force missed rendezvous and turned back followed by No.402 Squadron. Op. co-ordinated with 100A and B |
| 101                               | 21.9.41      | 12                  | 2       | 14,000                | Power Station Gosnay  | 14            | 41, 129, 616, 402, 607 escort wing;<br>452, 602, 485, 306, 308, 315 cover;<br>411, 412, 266 forward support  | 21                    | 9                 | -   |
| 102                               | 21.9.41      | 6                   | 5       | 14,000                | Railway repair Ships, Lille   | 10            | 71, 111, 222, 403 escort wing;<br>54, 603, 611, 72, 92, 609 cover  | 2                     | 2                 | Persistent attacks by enemy fighters  |
| 103A                              | 27.9.41      | 11                  | 2       | 14,000                | Marshalling yard, Amiens  | 9             | 452, 485, 602 escort wing;<br>41, 129, 616 cover;<br>306, 308, 315 high cover  | 7                     | 3                 | "Radial-engined fighters" reported  |
| 103B                              | 27.9.41      | 11                  | 2       | 15,000                | Power Station, Mazingarbe (not attacked; railway station bombed in error) | 11            | 54, 603, 611, 402, 403 escort wing;<br>71, 111, 222 cover;<br>72, 609, 92 high cover;<br>411, 412, 266 forward support                                       | 14                    | 7                 | Rendezvous late. Enemy fighters made determined attacks   |
| TOTALS: Sept:                     |              | 120 (12 operations) |         |                       |   | 152           |  | 83                    | 49                |   |
| TOTALS: 14th June - 30th Sept;    |              | 668 (84 operations) |         |                       |   | 1144          |  | 505                   | 244               |   |
| 104                               | 2.10.41      | 6                   | 2       | -                     | Power Station, Le Havre (not attacked)                                    | 8<br>9        | 41, 129, 616 escort wing;<br>452, 603 cover;<br>306, 308, 315 support;<br>222, 111, 71, 603, 54, 611<br>92, 72, 609 diversion                                | 5                     | 3                 | Rendezvous not made; diversion became main operation  |
| 105                               | 3.10.41      | 6                   | 2       | 10,000                | Power Station, Ostend   | 14            | 71, 111, 222 escort wing;<br>72, 609, 92 cover;<br>485, 602, 308, 315, 306 forward support;<br>54, 603, 611 rear support                                     | 1                     | 3                 | No.92 Squadron mistook enemy for No.609   |
| 106                               | -            | -                   | -       | -                     | -   | -             | -  | -                     | -                 | Cancelled   |
| 107                               | 12.10.41     | 24                  | 2       | 13,000                | Docks, Boulogne   | 19            | 54, 603, 611, 402 escort wing;<br>71, 111, 222 cover;<br>72, 92, 609 high cover;<br>452, 602, 485, 303, 308, 315 target support;<br>41, 65, 129 rear support | 4                     | 2                 | -   |
| 108A                              | 13.10.41     | 6                   | 2       | 13,500                | Shiplift, Arques near St. Omer  | 15            | 452, 485, 602 escort wing;<br>501, 118, 234 cover;<br>303, 308, 315 high cover;<br>41, 65, 129 target support;<br>266, 411, 412 rear support                 | 16                    | 8                 | Heavy opposition incl. "Radial-engined" fighters  |
| 108B                              | 13.10.41     | 18                  | 2       | 14,000                | Power Station, Mazingarbe   | 10            | 71, 111, 222, 402 escort wing;<br>54, 603, 611 cover;<br>72, 92, 609 high cover  | 5                     | 3                 | -   |
| TOTALS: Oct.                      |              | 60 (5 operations)   |         |                       |   | 75            |  | 31                    | 19                |   |
| TOTALS: 14th June to 31st October |              | 728 (89 operations) |         |                       |   | 1219          |  | 536                   | 263               |   |

| Circus No.                    | Date    | Bomber Force        |         | Bombing Height (Feet) | Target for Bombers.  | Fighter Force |  | E/A Dest. (Claimed) * | Our Pilots Lost ** | Remarks  |
|-------------------------------|---------|---------------------|---------|-----------------------|--|---------------|--|-----------------------|--------------------|--|
|                               |         | No. of A/C          | Gp. No. |                       |  | No. of Sqdns. | Sq. Nos. and Role  |                       |                    |  |
| 109                           | -       | -                   | -       | -                     | -  | -             | -  | -                     | -                  | Cancelled  |
| 110                           | 8.11.41 | 12                  | 2       | 13,000                | Railway Workshops, Lille (not attacked; attack on alternative) | 13            | 315, 308, 303 escort wing; 302, 316, 317 cover; 452, 435, 602 high cover; 411, 412, 616, 54 rear support | 4                     | 8                  | Co-ordinated with "Ramrod" and "Rodeo". Timing went wrong. |
| TOTALS: Nov.                  |         | 12 (1 operation)    |         |                       |  | 13            |  | 4                     | 8                  |  |
| TOTALS 14th June to 30th Nov. |         | 740 (90 operations) |         |                       |  | 1232          |  | 540                   | 271                |  |

(N.B. There were no "Circus" operations in December)

\* \* Figures based on "assessed" claims and losses as finally amended by H.Q.F.C.

SCHEDULE OF OPERATIONS WITH BOMBERS, OTHER THAN CIRCUS:  
14th June to 31st December, 1941

| Class and Number              | Date      | No. of Bombers      | Target                                     | No. of Sqdns. | Fighter Force                                   | E/A Dest. (claims)* | Pilots Lost * |
|-------------------------------|-----------|---------------------|--|---------------|---|---------------------|---------------|
|                               |           |                     |  |               | Squadron Nos.                                   |                     |               |
| "Roadstead"                   | 14.6.41   | 3                   | Shipping off Calais                        | 1             | 74  | -                   | -             |
| "Roadstead"                   | 17.6.41   | 7(T)                | Destroyers off Cherbourg                   | 2             | 118, 234  | 1                   | 1             |
| "Roadstead"                   | 17.6.41   | 1                   | In Cherbourg area                          | 2             | 118, 504  | -                   | -             |
| "Blot III"                    | 19.6.41   | 36                  | Le Havre (docks)                           | 7             | 145, 610, 616, 303, 1, 258, 312                 | -                   | -             |
| "Roadstead"                   | 19.6.41   | 3                   | Ship off Etaples                           | 3             | 611, 603, 92                                    | 1                   | -             |
| "Roadstead"                   | 27.6.41   | 3                   | Shipping off Calais                        | 2             | 92, 609   | -                   | -             |
| "Roadstead"                   | 28.6.41   | 3                   | Shipping off Gravelines                    | 2             | 92, 258   | -                   | -             |
| Totals 14th - 30th June       |           | 56 (7 operations)   |  | 19            |   | 2                   | 1             |
| "Roadstead"                   | 2.7.41    | 3                   | Shipping off Le Touquet                    | 2             | 92, 609   | -                   | -             |
| "Roadstead"                   | 5.7.41    | 6                   | Shipping off Ostend                        | 1             | 306   | -                   | -             |
| "Roadstead"                   | 6.7.41    | 3                   | Shipping off Gravelines                    | 3             | 609, 74, 308                                    | -                   | -             |
| "Roadstead"                   | 7.7.41    | 3                   | Shipping off Gravelines                    | 3             | 306, 222, 402                                   | -                   | -             |
| "Gudgeon I"                   | { 10.7.41 | 12                  | Shipping at Le Havre.                      | 3             | 316, 317, 504                                   | 2                   | -             |
|                               | { 10.7.41 | 12                  | Shipping at Cherbourg                      | 3             | 234, 501, 118                                   | 2                   | 1             |
| "Gudgeon II"                  | -         | -                   | -  | -             | -   | -                   | -             |
| "Gudgeon III"                 | { 14.7.41 | 6                   | Shipping at Cherbourg }                    | 2             | 234, 501 .                                      | 2                   | -             |
|                               | { 14.7.41 | 6                   | Shipping at Le Havre }                     |               |   |                     |               |
| "Roadstead"                   | 16.7.41   | 4                   | Shipping off Le Touquet                    | 1/2           | 54  | -                   | -             |
| "Roadstead"                   | 17.7.41   | 6                   | Shipping off Le Touquet                    | 2             | 1485, 602                                       | -                   | -             |
| "Roadstead"                   | 17.7.41   | 3(T)                | Shipping off Le Touquet                    | 2             | 603, 611  | -                   | -             |
| "Roadstead"                   | 18.7.41   | 3                   | Shipping off Dunkirk                       | 2             | 222, 609  | 1                   | 1             |
| "Roadstead"                   | 19.7.41   | 2                   | Tanker off Ostend                          | 1 1/2         | 611, 242  | -                   | -             |
| "Roadstead"                   | 20.7.41   | 6                   | Shipping off Dunkirk                       | 2             | 242, 222  | -                   | -             |
| "Roadstead"                   | 20.7.41   | 6                   | Shipping off Le Touquet                    | 4             | 72, 242, 222, 485                               | -                   | -             |
| "Roadstead"                   | 21.7.41   | 4                   | Shipping off Le Touquet                    | 2             | 242, 222  | -                   | -             |
| "Roadstead"                   | 21.7.41   | 3                   | Shipping off Dunkirk                       | 3             | 603, 242, 222                                   | -                   | -             |
| "Roadstead"                   | 22.7.41   | 6                   | Shipping in Channel                        | 1             | 485   | -                   | -             |
| "Roadstead"                   | 22.7.41   | 11(T)               | Shipping off Cherbourg                     | 5             | 616, 306, 308, 145, 610                         | -                   | -             |
| "Roadstead"                   | 23.7.41   | 6                   | Shipping off Gravelines                    | 3             | 242, 610, 145                                   | -                   | -             |
| "Roadstead"                   | 23.7.41   | 6                   | Shipping off Ostend                        | 3             | 242, 610, 145                                   | 2                   | -             |
| "Roadstead"                   | 24.7.41   | 6                   | Tanker off Pecamp                          | 3             | 72, 92, 609                                     | 1                   | -             |
| "Sunrise I"                   | 24.7.41   | 18                  | Cherbourg (diversion for Brest)            | 3             | 145, 610, 616                                   | -                   | -             |
| "Sunrise II"                  | 24.7.41   | 18                  | Cherbourg (diversion for Brest)            | 3             | 452, 485, 602                                   | 2                   | 1             |
| No. 10 Gp. "Sunrise"          | 24.7.41   | 115                 | <u>Gneisenau, Prinz Eugen, Scharnhorst</u> | 9             | 66, 152, 234, 316, 317, 501, 118, 504 composite | 3                   | 2 ✓           |
| Special Op.                   | 25.7.41   | 15                  | Ushant                                     | 1             | 66  | -                   | -             |
| "Roadstead"                   | 31.7.41   | 4                   | Shipping off Dieppe                        | 2             | 242, 452  | -                   | 1             |
| Totals July                   |           | 293 (25 operations) |  | 69            |   | 15                  | 6             |
| Totals 14th June to 31st July |           | 349 (32 operations) |  | 88            |   | 17                  | 7             |

\* Omitted without explanation from return of "assessed" claims and losses made by H.Q.F.C.

| Class and Number                   | Date    | No. of Bombers | Target                        | No. of Sqdns. | Fighter Force                     | E/A Dest. (claims) ✕ | Pilots Lost ✕ |
|------------------------------------|---------|----------------|-------------------------------|---------------|-----------------------------------|----------------------|---------------|
|                                    |         |                |                               |               | Squadron Nos.                     |                      |               |
| "Roadstead"                        | 1.8.41  | 3              | Shipping off Nicuport         | 1             | 242                               | -                    | 1             |
| "Roadstead"                        | 10.8.41 | 3              | Shipping off Gravelines       | 1½            | 242, 3                            | 1                    | 1             |
| "Roadstead"                        | 10.8.41 | 3              | Tanker off Gravelines         | 4½            | 242, 3, 306, 308, 315             | -                    | -             |
| "Operation 77"                     | 12.8.41 | 54             | Targets at Cologne            | 7             | 263, 66, 152, 234, 19, 65, 236    | -                    | 3             |
| "Roadstead"                        | 17.8.41 | 3(T)           | Tanker off Le Touquet         | 5½            | 3, 222, 315, 242, 308, 610        | -                    | -             |
| "Roadstead"                        | 17.8.41 | 3              | Same vessel as above          | 3½            | 3, 242, 603, 403                  | 3                    | 2             |
| "Roadstead"                        | 18.8.41 | 18             | Convoy off Dutch coast        | 2½            | 130, 152, 234, 257                | -                    | -             |
| No.10 Gp. Op.                      | 20.8.41 | 6              | Aerodrome, Bergen/Alkmaar     | 4             | 66, 152, 130 (24 a/c), 19, 257    | 2                    | 1             |
| No.10 Gp. Op.                      | 21.8.41 | 12             | Steel works, IJmuiden         | 2             | 66, 152, 130 (25 a/c)             | -                    | 2             |
| "Roadstead"                        | 22.8.41 | 6              | Shipping off Cherbourg        | 3             | 118, 501, 302                     | -                    | -             |
| "Roadstead"                        | 26.8.41 | 17             | Shipping off Dutch coast      | 1             | 19                                | -                    | -             |
| -                                  | 28.8.41 | 18             | Docks, Rotterdam              | 3             | 19, 152, 266                      | -                    | 3             |
| "Roadstead"                        | 30.8.41 | 3              | Shipping off Dunkirk          | 3             | 242, 54, 603                      | -                    | -             |
| "Roadstead"                        | 30.8.41 | 3              | As above (not attacked)       | 3             | 72, 611, 242                      | -                    | -             |
| "Gudgeon IV"                       | 31.8.41 | 6              | Aerodrome, Lannion            | 6             | 66, 263, 313, 130, 316, 302       | -                    | -             |
| Totals August                      |         | 158            | (15 operations)               | 50            |                                   | 6                    | 13            |
| Totals 14th June to 31st August    |         | 507            | (47 operations)               | 138           |                                   | 23                   | 20            |
| "Roadstead"                        | 2.9.41  | 3              | Tanker and escort off Dunkirk | 4             | 242, 611, 54, 603                 | -                    | -             |
| "Roadstead"                        | 2.9.41  | 3              | As above                      | 3             | 242, 485, 452                     | 2                    | -             |
| "Gudgeon V"                        | -       | -              | (Cancelled)                   | -             | -                                 | -                    | -             |
| "Gudgeon VI"                       | 4.9.41  | 6              | Whale oil ship, Cherbourg     | 7             | 263, 302, 316, 317, 118, 234, 501 | 1                    | 1             |
| "Roadstead"                        | 7.9.41  | 12             | Shipping off Holland          | 2             | 152, 257                          | 1                    | -             |
| "Roadstead"                        | 8.9.41  | 12             | Shipping off C.de la Hague    | 6             | 263, 118, 501, 234, 302, 317      | -                    | -             |
| "Roadstead"                        | 11.9.41 | 9              | Shipping off Holland          | 1½            | 152, 257                          | -                    | -             |
| "Roadstead"                        | 11.9.41 | 8              | Shipping in Baie de la Seine  | 2½            | 616, 129, 41                      | -                    | -             |
| "Roadstead"                        | 12.9.41 | 11             | Shipping off Holland          | 1½            | 152, 257                          | -                    | -             |
| "Roadstead"                        | 14.9.41 | 6              | Shipping off Holland          | 1             | 152, 19 (12 a/c)                  | -                    | -             |
| "Roadstead"                        | 17.9.41 | 3              | Shipping off Belgium          | 2             | 615, 609                          | -                    | -             |
| "Roadstead"                        | 18.9.41 | 3              | Shipping off Ostend           | 3             | 615, 41, 91                       | 7                    | 1             |
| "Roadstead"                        | 18.9.41 | 6              | Shipping off Holland          | 1½            | 152, 19                           | -                    | -             |
| "Roadstead"                        | 20.9.41 | 24             | Shipping off Holland          | 3             | 66, 152, 19                       | -                    | -             |
| "Gudgeon VII"                      | -       | -              | (Cancelled)                   | -             | -                                 | -                    | -             |
| "Gudgeon VIII"                     | 20.9.41 | 6              | Shipping at Cherbourg         | 6             | 501, 234, 118, 317, 316, 302      | -                    | -             |
| "Roadstead"                        | 28.9.41 | 3              | Shipping off France           | 2             | 54, 615                           | -                    | -             |
| TOTALS September                   |         | 115            | (15 operations)               | 46            |                                   | 11                   | 2             |
| TOTALS 14th June to 30th September |         | 622            | (62 operations)               | 184           |                                   | 34                   | 22            |

| Class and Number              | Date     | No. of Bombers    | Target                                   | Fighter Force   |  | E/A Dest. (claims)* | Pilots Lost # |
|-------------------------------|----------|-------------------|--|-----------------|--|---------------------|---------------|
|                               |          |                   |  | No. of Sqdns.   | Squadron Nos.                              |                     |               |
| "Roadstead"                   | 10.10.41 | 3                 | Shipping off Holland                     | 1½              | 152, 19                                    | -                   | -             |
| "Roadstead"                   | 12.10.41 | 12                | Shipping off Holland                     | 2               | 152, 19, 66(a/c), 22                       | -                   | -             |
| "10 Gp. Ramrod"               | 15.10.41 | 12                | Docks, Le Havre                          | 5               | 130, 313, 501, 234, 118 (and 2 a/c of 129) | 5                   | 1             |
| "Roadstead"                   | 17.10.41 | 12                | Shipping off Cherbourg                   | 3               | 501, 118, 234                              | -                   | -             |
| "Roadstead"                   | 20.10.41 | 8                 | Shipping off Holland                     | 1½              | 152, 19                                    | -                   | -             |
| "Roadstead"                   | 21.10.41 | 8                 | Shipping off Holland                     | 2               | 152, 19                                    | -                   | -             |
| "Roadstead"                   | 22.10.41 | 3                 | Shipping off Holland                     | 1½              | 152, 19                                    | -                   | -             |
| "10 Gp. Ramrod 13"            | 23.10.41 | 12                | Aerodromes, Lannion & Morlaix            | 4½              | 234, 118, 130, 313, 66                     | -                   | -             |
| "Roadstead"                   | 24.10.41 | 3                 | Shipping off Holland                     | ½               | 152  | -                   | 1             |
| "Roadstead"                   | 24.10.41 | 6                 | Shipping off Cherbourg                   | 3               | 501, 118, 234                              | -                   | -             |
| "Roadstead"                   | 26.10.41 | 8                 | Shipping off Holland                     | 1½              | 152, 19                                    | -                   | -             |
| "Roadstead"                   | 27.10.41 | 6                 | Shipping off Holland                     | 2               | 152, 19                                    | -                   | -             |
| "Roadstead"                   | 28.10.41 | 3<br>+ 3<br>Beaus | Shipping off Holland                     | 1               | 152  | -                   | -             |
| "Roadstead"                   | 30.10.41 | 4<br>(F.B.607)    | Shipping off Gravelines                  | 1               | 615 (7 a/c)                                | -                   | -             |
| "Low Ramrod 1"                | 31.10.41 | 8<br>(F.B.607)    | Transformer Stn., Holque                 | 4               | 603, 611, 54, 615                          | -                   | -             |
| "Low Ramrod 2"                | 31.10.41 | 8<br>(F.B.607)    | Barges nr. Gravelines                    | 3½              | 485, 602, 452, 615                         | -                   | 2             |
| TOTALS October                |          | 119               |  | 37½             |  | 5                   | 4             |
| TOTALS 14th June to 31st Oct. |          | 741 (78 Ops.)     |  | 221½            |  | 39                  | 26            |
| "Low Ramrod 3A"               | 1.11.41  | 8<br>(F.B.607)    | Army huts near Neufchâtel (not attacked) | 2<br>(+4 a/c)   | 71, 222 (and 4 a/c of 615)                 | -                   | -             |
| "Low Ramrod 3B"               | 1.11.41  | 8<br>(F.B.402)    | Aerodrome, Berck                         | 2               | 303, 315                                   | -                   | -             |
| Rear Suppt. for 3A and 3B     | 1.11.41  | -                 | -  | 1               | 308  | -                   | -             |
| "10 Gp. Ramrod 15"            | 1.11.41  | 12                | Aerodrome, Morlaix                       | 3               | 66, 130, 313                               | -                   | -             |
| "Low Ramrod 4A"               | 4.11.41  | 8<br>(F.B.607)    | Aerodrome, Le Touquet                    | 2               | 603, 611                                   | -                   | 1             |
| "Low Ramrod 4B"               | 4.11.41  | 8<br>(F.B.402)    | Aerodrome, Berck                         | 2               | 71, 222                                    | -                   | -             |
| Rear suppt. for 4A and 4B     | 4.11.41  | -                 | -  | 1               | 54   | -                   | -             |
| "Ramrod"                      | 6.11.41  | 8<br>(F.B.607)    | Barges on canals                         | 4               | 615, 303, 315, 308                         | 1                   | 1             |
| "Low Ramrod"                  | 7.11.41  | 6<br>(F.B.607)    | Alcohol plant, Beauchamps                | 4               | 615, 602, 485, 452                         | -                   | -             |
| "Low Ramrod"                  | 7.11.41  | -                 | Alcohol plants, various                  | 2               | 71, 222                                    | 1                   | -             |
| "Ramrod"                      | 8.11.41  | 8<br>(F.B.607)    | Alcohol plant, St. Pol                   | 5<br>(+4 a/c)   | 65, 41, 72, 401, 609 (and 615)             | 1                   | 5             |
| "Low Ramrod"                  | 11.11.41 | 8<br>(F.B.607)    | Ammo. train (not att'd)                  | 3               | 615, 485, 602                              | -                   | 1             |
| "Low Ramrod"                  | 11.11.41 | 12<br>(F.B.402)   | As above                                 | 2               | 234, 501                                   | -                   | 2             |
| Support for 2 Ops. above      | 11.11.41 | -                 | -  | 2               | 41, 65                                     | -                   | 1             |
| "Low Ramrod 10(I)"            | 15.11.41 | -                 | Alcohol plants, various                  | 3               | 303, 308, 315                              | -                   | -             |
| c/f                           |          | 86                |  | 38<br>(+ 8 a/c) |  | 3                   | 11            |

| Class and Number                  | Date     | No. of Bombers         | Target                   | No. of Sqdns.   | Fighter Force                                       | E/A Dest. (claims)* | Pilots Lost † |
|-----------------------------------|----------|------------------------|--------------------------|-----------------|---|---------------------|---------------|
|                                   |          |                        |                          |                 | Squadron Nos.                                       |                     |               |
| B/f                               |          | 86                     |                          | 38<br>(+ 8 a/c) |   | 3                   | 11            |
| "Low Ramrod 10(II)"               | 15.11.41 | 4<br>(F.B.607)         | Alcohol plant, Bourbourg | 2½              | 609, 401, 615                                       | -                   | 1             |
| "Low Ramrod 11"                   | 18.11.41 | 8<br>(F.B.607)         | Alcohol plant, Hesdin    | 6               | 613, 401, 609, 452, 485, 602                        | 1                   | -             |
| "Low Ramrod 12"                   | 23.11.41 | 4<br>(F.B.607)         | Alcohol plant, Bourbourg | 4               | 615, 315, 303, 308                                  | -                   | 6             |
| "10 Gp. Ramrod"                   | 25.11.41 | { 6<br>12<br>(F.B.402) | Aerodrome, Morlaix       | 3               | 402, 66, 130  | -                   | -             |
| Diversion for above               | 25.11.41 | -                      | -                        | 2               | 234, 118  | -                   | -             |
| "Roadstead"                       | 26.11.41 | 4<br>(F.B.402)         | Shipping off Cherbourg   | 2               | 234, 501  | -                   | -             |
| "Roadstead"                       | 27.11.41 | 8<br>(F.B.607)         | Shipping off Fécamp      | 3               | 603, 65, 41   | 2                   | -             |
| "Roadstead"                       | 27.11.41 | 8<br>(F.B.607)         | Shipping at Boulogne     | 7               | 303, 308, 315, 452, 485, 602, 71                    | -                   | 3             |
| "Roadstead"                       | 27.11.41 | 3(T)                   | Shipping off Holland     | 1½              | 152, 19   | -                   | -             |
| TOTALS November                   |          | 143 (24 Ops.)          |                          | 69<br>(+ 8 a/c) |   | 6                   | 21            |
| TOTALS 14th June to 30th November |          | 884 (102 Ops.)         |                          | say 291         |   | 45                  | 47            |
| "Roadstead"                       | 5.12.41  | 8<br>(F.B.607)         | Shipping off Fécamp      | 3               | 65, 41, 32  | 1                   | 4             |
| "Low Ramrod 15"                   | 8.12.41  | 8<br>(F.B.607)         | Alcohol plant, Hesdin    | 11              | 71, 222, 64, 411, 603, 72, 124, 401, 308, 315, 303  | 5<br>(+ 2 gd)       | 10            |
| "Roadstead"                       | 16.12.41 | 3(T)                   | Ships off Holland        | 1½              | 152, 19 (+ 3 Beau)                                  | -                   | -             |
| "Veracity"                        | 18.12.41 | 39                     | Ships at Brest           | 10              | 130, 234, 79, 118, 501, 615, 152, 66, 317, 306, 302 | 4                   | 1             |
| "Veracity II"                     | 30.12.41 | 16                     | Ships at Brest           | 9               | 501, 234, 118, 66, 152, 130, 317, 306, 302          | 6                   | 3             |
| TOTALS December                   |          | 74                     |                          | 34½             |   | 18                  | 18            |
| TOTALS 14th June to 31st December |          | 958                    |                          | say 325         |   | 63                  | 65            |

\* Figures based on "assessed" claims and losses as finally amended by H.Q.F.C. (except where stated)

APPENDIX (V)C

Fighter Sweeps without bombers: Summary of patrols  
and claims, 14th June to 31st December, 1941

| Month 1941          | No. of Patrols | No. of Squadrons | No. of E/A Claimed as Destroyed * | No. of our Pilots lost * |
|---------------------|----------------|------------------|-----------------------------------|--------------------------|
| June (14th to 30th) | 22             | 29               | 4                                 | 4                        |
| July                | 19             | 39               | 6                                 | 6                        |
| August              | 46             | 117              | 18                                | 8                        |
| September           | 24             | 45               | 7                                 | 7                        |
| October             | 35             | 77               | 27                                | 16                       |
| November            | 11             | 30               | 11                                | 5                        |
| December            | 4              | 19               | -                                 | -                        |
| <b>TOTALS</b>       | <b>161</b>     | <b>356</b>       | <b>73</b>                         | <b>46</b>                |

Operation "Warhead" and similar day offensive operations

| Month 1941    | Striking Force |            | Accompanying Force No. of Sqdns. | E/A claimed as destroyed *            | No. of our Pilots Lost * |
|---------------|----------------|------------|----------------------------------|---------------------------------------|--------------------------|
|               | No. of Patrols | No. of A/C |                                  |                                       |                          |
| June          | 1              | 4          | 1                                | -                                     | -                        |
| July          | -              | -          | -                                | -                                     | -                        |
| August        | 11             | 41         | 17½                              | 5 in flight)<br>+13 on ground)        | 2                        |
| September     | 3              | 12         | 3                                | 1 on ground                           | 2                        |
| October       | -              | -          | -                                | -                                     | -                        |
| November      | -              | -          | -                                | -                                     | -                        |
| December      | -              | -          | -                                | -                                     | -                        |
| <b>TOTALS</b> | <b>15</b>      | <b>57</b>  | <b>21½</b>                       | <b>5 in flight)<br/>14 on ground)</b> | <b>4</b>                 |

\* Figures based on assessed claims and losses as finally amended by H.Q.F.C.

Operation "Rhubarb": Summary of Patrols and Claims.  
14th June to 31st Dec. 1941.

| Month                    | No. of Patrols | No. of Sorties | (1)<br>No. of Patrols Abortive | No. of times e/a seen in air | No. of e/a seen in air | (2)<br>No. of times e/a engaged in air | (3)<br>No. of attacks on surface objectives | #<br>No. of e/a claimed as destroyed | #<br>No. of our pilots lost |
|--------------------------|----------------|----------------|--------------------------------|------------------------------|------------------------|--|---|--------------------------------------|-----------------------------|
| 1941<br>June (14th-30th) | -              | -              | -                              | -                            | -                      | -                                      | -   | -                                    | -                           |
| July                     | 31             | 61             | 23                             | -                            | -                      | -                                      | 6   | -                                    | 1                           |
| August                   | 86             | 189            | 25                             | 3                            | 14                     | 3                                      | 71  | -                                    | 3                           |
| September                | 43             | 103            | 12                             | 11                           | 23                     | 10                                     | 28  | 5                                    | 3                           |
| October                  | 96             | 246            | 21                             | 10                           | 14                     | 9                                      | 102   | 7                                    | 5                           |
| November                 | 59             | 208            | 8                              | 6                            | 10                     | 6                                      | 64  | 2                                    | 6                           |
| December                 | 30             | 79             | 12                             | 2                            | 3                      | 2                                      | 26  | -                                    | 1                           |
|                          | 345            | 886            | 101                            | 32                           | 64                     | 30                                     | 297   | 14                                   | 19                          |

\* Figures based on "assessed" claims and losses as finally amended by H.Q.F.C.

Analysis of Attacks on Surface Objectives  
during this period

|                                 | June | July | Aug. | Sept. | Oct. | Nov. | Dec. | Total |
|---------------------------------|------|------|------|-------|------|------|------|-------|
| Enemy a/c on ground             | -    | -    | 6    | 1     | 3    | 2    | -    | 12    |
| Aerodrome buildings, etc.       | -    | -    | 3    | 2     | 12   | 1    | 1    | 19    |
| Gun and S/L posts               | -    | -    | 9    | 4     | 6    | 4    | 3    | 26    |
| Ships                           | -    | 3    | 11   | 4     | 7    | 5    | 4    | 34    |
| Troops, camps, etc.             | -    | 1    | 10   | 3     | 8    | 6    | 1    | 29    |
| Road vehicles                   | -    | 1    | 8    | 3     | 5    | 4    | 1    | 22    |
| Trains and rly. system          | -    | -    | 12   | 7     | 34   | 16   | 5    | 74    |
| Barges and canal system         | -    | 1    | -    | -     | 10   | 2    | 1    | 14    |
| Electrical and gas systems      | -    | -    | 1    | -     | 3    | -    | 2    | 6     |
| Factories, docks, storage, etc. | -    | -    | 7    | 1     | 8    | 6    | 1    | 23    |
| W/T, Radar and Beam Stations    | -    | -    | 4    | 3     | 6    | 4    | -    | 17    |
| Alcohol Plants                  | -    | -    | -    | -     | -    | 14   | 7    | 21    |
| TOTALS                          | -    | 6    | 71   | 28    | 102  | 64   | 26   | 297   |

- Notes: (1) An abortive patrol was one in which the aircraft left the ground but were prevented by weather or other circumstances from carrying out a "Rhubarb" patrol.  
(2) For this purpose, firing by either side constitutes "engagement".  
(3) Attacks on the same objective by two or more aircraft flying together have been treated as one attack.

APPENDIX (V)E

Day Offensive Operations not included in other categories  
in which casualties were suffered or claimed  
14th June to 31st December, 1941

| Date     | No. of A/C | Sqdn. Nos. | Description of Operation                         | No. of E/A Claimed as Destroyed* | No. of our Pilots Lost * |
|----------|------------|------------|--|----------------------------------|--------------------------|
| 21. 6.41 | 1          | 257        | Freelance patrol                                 | 2                                | -                        |
| 22. 6.41 | 2          | 601        | Escort Blenheim on armed shipping reconnaissance | 1                                | -                        |
| 26. 7.41 | 1          | 91         | Shipping reconnaissance                          | 1                                | -                        |
| 31. 7.41 | 1          | 91         | Shipping reconnaissance                          | 2                                | -                        |
| 3. 8.41  | 2          | 242        | Attack on "E" boat                               | 1                                | -                        |
| 9. 8.41  | 1          | 91         | Shipping reconnaissance                          | 1                                | -                        |
| 29. 8.41 | 1          | 91         | Shipping reconnaissance                          | 1                                | -                        |
| 4. 9.41  | 1          | 91         | Shipping reconnaissance                          | 2                                | -                        |
| 9. 9.41  | 1          | 91         | Shipping reconnaissance                          | 1<br>(gd)                        | -                        |
| 16. 9.41 | 1          | 91         | Interception patrol                              | 1<br>(gd)                        | -                        |
| 16. 9.41 | 1          | 91         | Offensive interception patrol                    | 1                                | -                        |
| 18. 9.41 | 1          | 91         | Shipping reconnaissance                          | 1                                | -                        |
| 26. 9.41 | 1          | 91         | Weather and shipping reconnaissance              | 1                                | -                        |
| 6.10.41  | 4          | 615        | Shipping reconnaissance                          | -                                | 1                        |
| 12.10.41 | 4          | 118        | Cover for reconnaissance                         | 3                                | -                        |
| 28.10.41 | 1          | 91         | Shipping reconnaissance                          | 1                                | -                        |
| 2.11.41  | 4          | 615<br>607 | Armed shipping reconnaissance                    | -                                | 3                        |
| 12.11.41 | 1          | 91         | Weather reconnaissance                           | 1                                | -                        |
| 25.11.41 | 1          | 91         | Weather and shipping reconnaissance              | 1                                | -                        |
| 5.12.41  | 2          | 234        | Shipping reconnaissance                          | -                                | 2                        |
|          | 32         |            |  | 20 in flight)<br>+2 on ground)   | 6                        |

\* Figures based on assessed claims and losses as finally amended by H.Q.F.C.

APPENDIX (V)F

Daylight Offensive Operations, 14th June to 31st December, 1941:  
numbers of enemy aircraft claimed as destroyed by fighters  
and of fighter pilots lost, by months

| Month<br>1941          | Circus |        | Roadstead |        | Blot<br>Gudgeon,<br>Ramrod,<br>etc. |        | Fighter Sweeps |        | Warhead etc. |        | Rhubarb |        | Reconnaissance<br>Flights |        | Totals |        | E/A per pilot lost |
|------------------------|--------|--------|-----------|--------|-------------------------------------|--------|----------------|--------|--------------|--------|---------|--------|---------------------------|--------|--------|--------|--------------------|
|                        | E/A    | Pilots | E/A       | Pilots | E/A                                 | Pilots | E/A            | Pilots | E/A          | Pilots | E/A     | Pilots | E/A                       | Pilots | E/A    | Pilots |                    |
| June (14th<br>to 30th) | 161    | 39     | 2         | 1      | -                                   | -      | 4              | 4      | -            | -      | -       | -      | 3                         | -      | 170    | 44     | 3.9                |
| July                   | 161    | 84     | 4         | 2      | 11                                  | 4      | 6              | 6      | -            | -      | -       | 1      | 3                         | -      | 185    | 97     | 1.9                |
| August                 | 100    | 72     | 4         | 4      | 2                                   | 9      | 18             | 8      | 18           | 2      | -       | 3      | 3                         | -      | 145    | 98     | 1.5                |
| September              | 83     | 49     | 10        | 1      | 1                                   | 1      | 7              | 7      | 1            | 2      | 5       | 3      | 7                         | -      | 114    | 63     | 1.8                |
| October                | 31     | 19     | -         | 1      | 5                                   | 3      | 27             | 16     | -            | -      | 7       | 5      | 4                         | 1      | 74     | 45     | 1.6                |
| November               | 4      | 8      | 2         | 3      | 4                                   | 18     | 11             | 5      | -            | -      | 2       | 6      | 2                         | 3      | 25     | 43     | 0.6                |
| December               | -      | -      | 1         | 4      | 17                                  | 14     | -              | -      | -            | -      | -       | 1      | -                         | 2      | 18     | 21     | 0.9                |
|                        | 540    | 271    | 23        | 16     | 40                                  | 49     | 73             | 46     | 19           | 4      | 14      | 19     | 22                        | 6      | 731    | 411    | 1.8                |

APPENDIX(V)G

The Effects of the Royal Air Force Daylight

Offensive in 1941 on the

German Fighter Force

Casualties Claimed and Suffered

During the preliminary phase of the daylight offensive, which lasted from December 20th, 1940 until June 13th, 1941 Fighter Command claimed the destruction of 39 German aircraft in the course of fighter sweeps (including operation "Sphere") and operations "Rhubarb", "Circus", "Roadstead" and "Blot". The Command claimed the destruction of another five enemy aircraft in the course of miscellaneous offensive operations including reconnaissance flights. All but one of these claims related to aircraft of day fighter type and none to the period before January 1st, 1941. In addition the destruction of one or two German fighters was claimed by Bomber Command.

According to the records of the 6th Abteilung, German Air Ministry, which appear to have been scrupulously kept, the number of German aircraft of day fighter type which were lost in combat over the enemy side of the Channel during this period was 58. It is possible that this figure may include some aircraft which really suffered damage during operations on the English side of the Channel and subsequently crashed in France, but every attempt has been made to exclude such cases. It would appear, therefore, that during this period of comparatively slight activity the claims of our pilots were on the modest side and that some of the German aircraft claimed as "probably destroyed" should really be counted as destroyed.

In these operations we lost 51 fighter pilots.

On June 14th a new, intensive phase began and during the next six weeks the claims of Fighter Command to the destruction of German aircraft in the course of  
/daylight

daylight offensive operations amounted to no less than 355, while Bomber Command claimed the destruction of at least another five. The German records show, however, that in point of fact only 81 German aircraft of day fighter type were lost in combat over the enemy side of the Channel during these six weeks. It would seem that as soon as the tempo of operations increased, the safeguards which had been imposed to guard against duplicate and exaggerated claims by our pilots became ineffective and that (doubtless in good faith) the enemy's losses were greatly over-assessed.

During these six weeks we lost 141 fighter pilots.

Over the whole period from June 14th up to the end of 1941, Fighter Command claimed the destruction of 731 German aircraft in these operations. The number of German aircraft of day fighter type actually lost in combat, according to the German records was, however, only 135.

Since this figure appears to be incontrovertible, it would seem that our claims at this stage were much exaggerated.

No appreciable error will be introduced if, for the purpose of comparison, all German aircraft claimed as destroyed are counted as day fighters (since all but two or three of the claims made related to this class) and the small number of claims made by Bomber Command be ignored. On this basis Fighter Command claims and losses and the true losses of the German fighter force as revealed by the German records were as follows:

| <u>Period</u>                   | <u>E/A claimed<br/>by F.C. as<br/>destroyed</u> | <u>F.C.<br/>Pilots<br/>lost</u> | <u>German<br/>fighters<br/>actually<br/>destroyed</u> |
|---------------------------------|---|---------------------------------|---|
| 20.12.40 to 13.6.41             | 44  | 51                              | 58  |
| 14.6.41 to 31.7.41              | (355)   | (141)                           | (81)  |
| 14.6.41 to 31.12.41             | 731   | 411                             | 135   |
| Totals, 20.12.40 to<br>31.12.41 | 775   | 462                             | 193   |

/Thus

Thus it would appear that over the whole year the losses really inflicted on the Germans in our daylight offensive operations were almost exactly one quarter of those claimed by our pilots and that for every German aircraft that we destroyed we lost nearly two-and-a-half pilots.

German Order of Battle

One of the chief aims of the Royal Air Force daylight offensive after the middle of June was to restrain the Germans from moving further fighter units from the western to the eastern front and, if possible, persuade them to reverse this process.

It was accepted by the autumn of 1941 that the second part of this aim had not been and was not likely to be achieved. There was no evidence that any first-line units had been moved from east to west in consequence of the campaign, although the defences in the west had, it was thought, been strengthened by creating quasi first-line units from the resources of the reserve training organisation.

Captured German documents show that these beliefs were substantially correct. On June 28th, 1941 when the period of intensive operations was a fortnight old, the first-line day-fighter units now known to have been in northern France comprised the whole of J.G.2 and all of J.G.26 except the 7th Staffel, which was in the Mediterranean. These units had an aggregate establishment of 236 aircraft. Other first-line day-fighter units known to have been on the western front (excluding Norway) were I/J.G.52 (establishment 40 aircraft), which was in the Low Countries, and part of J.G.1 (establishment 28 aircraft), whose precise location at that time is not clear. In addition there were a number of reserve training units which had, nominally at least, an aggregate quasi first-line establishment of 48 aircraft.

Three months later, on September 27th, the whole of J.G.2 and J.G.26, with an establishment of 248 aircraft, were in northern France; I/J.G.52, still with an establishment of 40 aircraft, remained in the Low Countries; and the Geschwaderstab and first Gruppe of J.G.1 were in north-west Germany with an establishment of 44 aircraft. In addition, the Geschwaderstab and first Gruppe of J.G.53 had arrived in the Low Countries from the eastern front. This move was, however, only apparently a reinforcement of the west at the expense of the east; in reality J.G.53 seem to have come to replace J.G.52, which moved later to the eastern front. The number of reserve training units with a quasi first-line establishment had increased since the summer and a normal first-line establishment of 112 aircraft was now attributed to these units.

At the end of another three months, on December 27th, the whole of J.G.2 were still in northern France, but II/J.G.26 had gone out of the line to re-equip, so that the first-line establishment of these two Geschwader was reduced to 208 aircraft. The Geschwaderstab and first Gruppe of J.G. 53 had moved to the Mediterranean. The nominal first-line establishment attributed to the operational training units remained at 112 aircraft.

The position on these three dates is summed up in the following table :

| <u>Estab. W.Front (excl. Norway)</u> | <u>28.6.41</u> | <u>27.9.41</u> | <u>27.12.41</u> |
|--------------------------------------|----------------|----------------|-----------------|
| <u>1st Line</u>                      |                |                |                 |
| France                               | 236            | 248            | 208             |
| Elsewhere or unlocated               | 68             | 128            | 44              |
| <u>1st line totals</u>               | 304            | 376            | 252             |
| <u>Quasi 1st Line (R.T.U.)</u>       | 48             | 112            | 112             |
| <u>Grand totals</u>                  | 352            | 488            | 364             |

/German

### German Strength and Serviceability

Since the burden of meeting the Royal Air Force daylight offensive fell mainly on the two genuine first-line Geschwader in northern France, namely J.G.2 and J.G.26, the question of strength and serviceability may be considered primarily in regard to those two units.

The German records show that on June 28th, 1941 J.G.2 and J.G.26 (excluding 7/J.G.26, which was elsewhere) had an aggregate "actual" strength of 193 aircraft and an aggregate serviceability of 140 aircraft, or 73 per cent of that figure. These figures are consistent with the account given by Adolf Galland, who says that in the Spring the aggregate serviceability was 160 to 200 aircraft and suggests that by the end of June it had begun to decline.

Adolf Galland also says that in August serviceability fell to about 45 aircraft in each Geschwader. This statement, too, is fairly well upheld by the German records, which show that the aggregate serviceability of the two Geschwader reached its lowest level on August 23rd, when it stood at 97 aircraft, or 70 per cent of an "actual" strength of 140 aircraft.

By September 27th aggregate "actual" strength had gone up to 234 aircraft and serviceability to 191 aircraft, or 81 per cent of this figure, and by December 27th, despite the absence of II/J.G.26 and a consequent drop in establishment, aggregate "actual" strength remained high at 190 aircraft and serviceability once again stood at 81 per cent of the strength, or 154 aircraft.

/The

The foregoing may be summarised as follows:

|                             | <u>"Actual"</u><br><u>Strength</u> | <u>Serviceable</u><br><u>Aircraft</u> | <u>%</u><br><u>Serviceability</u> |
|-----------------------------|------------------------------------|---------------------------------------|-----------------------------------|
| Spring, 1941<br>(Galland)   |                                    | 160 - 200                             |                                   |
| 28.6.41<br>(German records) | 193                                | 140                                   | 73                                |
| August, 1941<br>(Galland)   |                                    | 90                                    |                                   |
| 23.8.41<br>(German records) | 140                                | 97                                    | 70                                |
| 27.9.41                     | 234                                | 191                                   | 81                                |
| 27.12.41                    | 190                                | 154                                   | 81                                |

The records also show that the number of serviceable aircraft in the quasi first-line reserve training units stood on June 28th at 32 aircraft, on September 27th at 57 aircraft, and on December 27th at 69 aircraft. The part played by these units remains obscure, but on grounds of general probability it seems fair to assume that their contribution to active operations was not great.

Summing up

The following are reasonable inferences from the evidence of the German records and statements by Adolf Galland:

- a. The daylight offensive resulted in much heavier casualties to Fighter Command than to the enemy.
- b. It did not cause the Germans to bring back any units from the eastern front, except in so far as Stab and I/J.G.53 were brought back to replace I/J.G.52 and for some days or weeks parts of both Geschwader were present on the western front together.

- c. To meet the offensive the Germans retained in northern France two valuable fighter Geschwader, parts of which, in other circumstances, they might have chosen to employ elsewhere. Towards the end of the year they were able to move a Gruppe of fighters from the Low Countries to the Mediterranean, but by this time our offensive had virtually ceased.
- d. The offensive may have prevented the Germans from moving fighters to the Mediterranean theatre at an earlier date, as was believed at the time; but this issue raises a number of hypothetical questions to which no final answers can be given.
- e. In its earlier stages the offensive caused a substantial decline in the strength of the two Geschwader chiefly involved. This process reached a climax towards the end of August. At this point we decided to reduce the intensity of our offensive as the ratio of claims to our losses was growing less favourable. Thereafter the strength of the German units improved greatly. Within five weeks the two Geschwader were as strong as in the Spring.
- f. Since there is no evidence that the German serviceability ratio was very low at any time it would seem that their servicing and maintenance resources were never unduly stretched. On the other hand the figures suggest that during the summer the units had difficulty in getting replacements for aircraft written off.

g. The change in the status of the German reserve training units was almost certainly a reaction to our offensive, but it was not necessarily a sign of weakness. It might even be interpreted as a sign of strength, since it shows that the Germans had precisely what we had lacked in the previous summer - namely, a satisfactory "reservoir" of pilots in the reserve training organisation.

h. At the same time there is credible evidence that at one stage the fighter force in northern France lacked experienced pilots, so that some officers had to be brought back from the eastern front.

In short, it is established that our offensive did not bring about any substantial alteration in the enemy's order of battle, although it probably did lead to the transfer of some individuals from one front to another; but that, at a high cost in pilots lost, it did bring about a temporary decline in strength. When our offensive slackened the Germans were, however soon able to restore the situation.

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## OPERATION "INTRUDER": SORTIES AND CLAIMS, 1940-1941

| Date       | No. of Sorties | Squadron Number | No. of a/c seen | No. of e/a claimed as destroyed | No. of bombing attacks on aerodromes reported # | Our a/c lost | Remarks   |
|------------|----------------|-----------------|-----------------|---------------------------------|---|--------------|---|
| DEC. 1940. |                |                 |                 |                                 |   |              |   |
| 21/22      | 6              | 23              | 4               | -                               | 4   | -            |   |
| 22/23      | 7              | 23              | 3               | -                               | 9   | 1            | One Blenheim down in sea short of fuel: two drowned, pilot safe.                                    |
| 29/30      | 1              | 23              | -               | -                               | -   | -            | Thick cloud: Blenheim returned early.   |
| JAN. 1941  |                |                 |                 |                                 |   |              |   |
| 2/3        | 6              | 23              | 2               | -                               | 1   | -            | One e/a claimed as probably destroyed. Three Benheims returned early because of mechanical defects. |
| 3/4        | 6              | 23              | 7               | -                               | 9   | 1            | Aircraft seen included three on an aerodrome. One Blenheim failed to return.                        |
| 9/10       | 2              | 23              | -               | -                               | -   | 1            | One Blenheim failed to return.  |
| 11/12      | 1              | 23              | -               | -                               | -   | -            | Blenheim turned back at French coast because of bad weather.  |
| 12/13      | 3              | 23              | -               | -                               | 1   | -            | Weather bad: One Blenheim returned after 13 minutes.  |
| 16/17      | 3              | 23              | -               | -                               | 1   | -            | Weather bad: two Benheims turned back before reaching objectives.                                   |
| 17/18      | 2              | 23              | 2               | -                               | 1   | -            | One e/a claimed as probably destroyed.  |
| FEB. 1941  |                |                 |                 |                                 |   |              |   |
| 15/16      | 1              | 23              | -               | -                               | -   | -            | Returned with engine trouble after 15 mins.   |
| 17/18      | 1              | 23              | -               | -                               | -   | -            | Covered several aerodromes but uneventful.  |
| 20/21      | 2              | 23              | -               | -                               | 1   | -            | One Blenheim forced back by snowstorm: aerodrome attacked by other probably dummy.                  |
| 21/22      | 1              | 23              | -               | -                               | -   | -            | Turned back almost at once because of bad weather.  |
| 25/26      | 1              | 23              | 15              | -                               | 1   | -            | Much activity at Merville. Three e/a attacked, one claimed probably destroyed.                      |
| 26/27      | 2              | 23              | 4               | -                               | 1   | -            | Two e/a attacked and damaged.   |
| C/f        | 45             |                 | 37              | -                               | 29  | 3            |   |

# Excluding repeated attacks on one aerodrome by the same aircraft in the course of a single sortie.

/Contd.....

| B/f.        | 45  | *   | 7   | - | 29 | 3 |  |
|-------------|-----|-----|-----|---|----|---|--|
| MARCH 1941. |     |     |     |   |    |   |  |
| 1/2         | 4   | 23  | -   | - | 2  | - |  |
| 3/4         | 6   | 23  | 2   | 1 | 1  | 1 | One e/a claimed as destroyed, one probably destroyed. One Blenheim failed to return. |
| 4/5         | 2   | 23  | 1   | - | -  | - | One e/a claimed as probably destroyed.   |
| 8/9         | 9   | 23  | 4   | - | 4  | - | Two e/a claimed as damaged.  |
| 10/11       | 5   | 23  | 3   | - | 4  | 1 | One Blenheim failed to return.   |
| 11/12       | 2   | 23  | 1   | 1 | 1  | - | One e/a claimed as destroyed on ground.  |
| 12/13       | 6   | 23  | -   | - | 7  | - |  |
| 13/14       | 5   | 23  | 10  | - | 4  | - | Much activity at Caen/Carpiquet. "Many" aircraft seen.                               |
| 14/15       | 4   | 23  | 5   | - | 3  | - | One e/a claimed as probably destroyed.   |
| 14/15       | 2   | 87  | 20  | 1 | -  | - | Two Hurricanes saw about 20 e/a on ground at Caen/Carpiquet, Set fire to one.        |
| 19/20       | 5   | 23  | 5   | - | 1  | - | Four Blenheims returned early because of bad weather.                                |
| 30/31       | 1   | 23  | -   | - | 1  | - |  |
| APRIL 1941. |     |     |     |   |    |   |  |
| 3/4         | 2   | 23  | 2   | - | 1  | - | One e/a claimed as damaged.  |
| 4/5         | 1   | 23  | -   | - | -  | - | Turned back because of bad weather.  |
| 7/8         | 7   | 23  | 10  | - | 4  | - | First patrol by a Havoc. Three Blenheims had uneventful patrols. Two e/a attacked.   |
| 7/8         | 5   | 141 | 5   | - | -  | - | Five Defiants made offensive patrols during night.                                   |
| 8/9         | 4   | 23  | -   | - | 3  | - |  |
| 9/10        | 6   | 23  | -   | - | 2  | 1 | One Blenheim failed to return.   |
| 9/10        | 2   | 87  | 2   | - | -  | - | Hurricanes attacked e/a on ground at Caen/Carpiquet.                                 |
| 9/10        | 1   | 141 | -   | - | -  | - | Defiant  |
| 14/15       | 1   | 23  | -   | - | -  | - | Thick cloud; nothing seen.   |
| 15/16       | 3   | 23  | 3   | - | 1  | - | One e/a attacked.  |
| 16/17       | 4   | 23  | 3   | - | 1  | - | Weather bad.   |
| 17/18       | 3   | 23  | -   | - | -  | - | Weather bad.   |
| 20/21       | 1   | 23  | -   | - | -  | - |  |
| 21/22       | 4   | 23  | 3   | 1 | 1  | - | E/a attacked was seen to disintegrate.   |
| 23/24       | 1   | 23  | -   | - | -  | - | Weather bad.   |
| 24/25       | 3   | 23  | -   | - | 1  | - |  |
| 26/27       | 3   | 23  | -   | - | 1  | - | Weather bad.   |
| 27/28       | 1   | 23  | -   | - | -  | - |  |
| 29/30       | 5   | 23  | 5   | 1 | 2  | - | E/a attacked was seen to crash.  |
| C/f.        | 153 |     | 121 | 5 | 74 | 6 |  |

| B/f        | 153 |     | 121 | 5  | 74  | 6 |  |
|------------|-----|-----|-----|----|-----|---|--|
| NY 1941.   |     |     |     |    |     |   |  |
| 2/3        | 5   | 23  | 5   | 1  | 4   | - | E/a attacked was seen to explode.  |
| 3/4        | 6   | 23  | 8   | 2  | 5   | - | Several combats. Two e/a claimed as probably destroyed.                          |
| 4/5        | 5   | 23  | 22  | -  | 4   | - | One e/a claimed as probably destroyed and two as damaged.                        |
| 5/6        | 1   | 23  | 5   | 1  | 1   | - | E/a attacked seemed to disintegrate.   |
| 6/7        | 5   | 23  | 5   | -  | 4   | - | One e/a claimed as probably destroyed.   |
| 7/7        | 2   | 87  | -   | -  | -   | - | Weather bad.   |
| 7/8        | 6   | 23  | 26  | 1  | 4   | - | Much activity seen.  |
| 7/8        | 4   | 87  | 40  | 1  | -   | - | Hurricanes attacked aircraft in air and others on ground at Cherbourg/Maupertus. |
| 7/8        | 2   | 264 | 6   | 2  | -   | - | Three e/a claimed as damaged.  |
| 8/9        | 5   | 23  | 2   | -  | 2   | - |  |
| 8/9        | 1   | 601 | -   | -  | -   | - | Hurricane; saw nothing of interest.  |
| 8/9        | 4   | 264 | 1   | 1  | -   | - | E/a attacked by Defiant seen to crash.   |
| 9/10       | 4   | 23  | -   | -  | 4   | - |  |
| 9/10       | 1   | 264 | -   | -  | -   | - | Defiant.   |
| 10/11      | 4   | 23  | 2   | 1  | 1   | - | E/a seen to crash.   |
| 10/11      | 2   | 87  | -   | -  | -   | - | Hurricanes returned before crossing French coast.                                |
| 10/11      | 1   | 601 | 1   | -  | -   | - | Hurricane; saw one e/a.  |
| 10/11      | 2   | 264 | 1   | 1  | -   | - | E/a attacked by Defiant seen to crash.   |
| 11/12      | 6   | 23  | 1   | -  | 4   | - | One e/a claimed as damaged.  |
| 11/12      | 1   | 601 | 1   | -  | -   | - | Hurricane.   |
| 12/13      | 2   | 23  | -   | -  | -   | - |  |
| 15/16      | 1   | 23  | -   | -  | -   | - |  |
| 16/17      | 7   | 23  | 2   | -  | 5   | - |  |
| JUNE 1941. |     |     |     |    |     |   |  |
| 1/12       | 4   | 23  | -   | -  | -   | - | Weather bad.   |
| 12/13      | 3   | 23  | -   | -  | 2   | - |  |
| 12/13      | 1   | 242 | 2   | 1  | -   | - | E/a attacked by Hurricane seen to side-slip: explosion seen on ground.           |
| 13/14      | 7   | 23  | -   | -  | 4   | - | Weather bad.   |
| 13/14      | 1   | 242 | -   | -  | -   | - |  |
| C/f.       | 246 |     | 251 | 17 | 118 | 6 |  |

| B/f       | 246 |     | 251 | 17 | 118 | 6 |   |
|-----------|-----|-----|-----|----|-----|---|---|
| JUNE 1941 |     |     |     |    |     |   |   |
| 15/16     | 5   | 23  | 1   | -  | 3   | - | -   |
| 16/17     | 6   | 23  | -   | -  | 2   | - | -   |
| 16/17     | 4   | 306 | -   | -  | -   | - | Hurricanes  |
| 17/18     | 4   | 23  | -   | -  | 1   | - | -   |
| 21/22     | 2   | 23  | -   | -  | 2   | - | -   |
| 22/23     | 2   | 23  | 1   | -  | 1   | - | -   |
| 23/24     | 4   | 23  | -   | -  | 1   | - | -   |
| 24/25     | 2   | 23  | -   | -  | 1   | - | -   |
| 25/26     | 4   | 23  | -   | -  | 1   | - | -   |
| 26/27     | 3   | 23  | -   | -  | -   | - | -   |
| 27/28     | 1   | 23  | -   | -  | 1   | - | -   |
| 28/29     | 1   | 23  | -   | -  | -   | - | -   |
| JULY 1941 |     |     |     |    |     |   |   |
| 1/2       | 3   | 23  | -   | -  | 3   | - | -   |
| 4/5       | 7   | 23  | -   | -  | -   | - | Objective of all sorties was railway yard at Abbeville.                 |
| 4/5       | 2   | 3   | -   | -  | -   | - | Hurricanes  |
| 5/6       | 8   | 23  | -   | -  | 6   | - | Six of the Havocs attacked aerodrome at Caen/Carpiquet.                 |
| 6/7       | 6   | 23  | -   | -  | 6   | - | All six Havocs attacked aerodrome on Guernsey.                          |
| 7/8       | 6   | 23  | -   | -  | 5   | - | Five Havocs attacked aerodrome at Le Tourquet.                          |
| 7/8       | 3   | 3   | 1   | -  | -   | - | E/a attacked by Hurricane claimed as probably destroyed.                |
| 8/9       | 6   | 23  | -   | -  | 6   | - | All six Havocs attacked aerodrome at Caen/Carpiquet.                    |
| 13/14     | 7   | 23  | 6   | -  | 6   | - | Targets aerodromes at Poix and Berck. Six e/a seen on ground at latter. |
| 13/14     | 2   | 3   | -   | -  | -   | - | Hurricanes.   |
| 15/16     | 4   | 23  | -   | -  | 1   | - | Objectives were aerodromes at Poix and Berck.                           |
| 16/17     | 1   | 23  | -   | -  | -   | - | -   |
| 17/18     | 7   | 23  | -   | -  | 4   | - | -   |
| 18/19     | 2   | 23  | -   | -  | -   | - | -   |
| 20/21     | 6   | 23  | -   | -  | 6   | - | -   |
| 21/22     | 7   | 23  | -   | -  | 2   | - | -   |
| C/f.      | 361 |     | 260 | 17 | 176 | 6 |   |

| B/f  | 361 | 260 | 17  | 176 | 6   |   |
|--|-----|-----|-----|-----|-----|---|
| JULY 1941.   |     |     |     |     |     |   |
| 22/23  | 6   | 23  | -   | -   | 3   | - |
| 24/25  | 3   | 23  | -   | -   | 2   | - |
| 25/26  | 2   | 23  | -   | -   | 1   | - |
| 27/28  | 4   | 23  | 5   | -   | 3   | - |
| 27/28  | 1   | 3   | -   | -   | -   | - |
| 29/30  | 2   | 23  | 2   | -   | 2   | - |
| An e/a attacked; raid on London.   |     |     |     |     |     |   |
| -----  |     |     |     |     |     |   |
| 2/3  | 1   | 23  | -   | -   | -   | - |
| 6/7  | 6   | 23  | -   | -   | 5   | - |
| 6/7  | 3   | 87  | 3   | -   | -   | - |
| 7/8  | 6   | 23  | -   | -   | 6   | - |
| 11/12  | 7   | 23  | -   | -   | 7   | - |
| 12/13  | 1   | 23  | 20  | -   | 1   | - |
| 13/14  | 1   | 3   | -   | -   | -   | 1 |
| 16/17  | 2   | 23  | -   | -   | -   | - |
| 17/18  | 2   | 23  | 1   | -   | -   | - |
| 18/19  | 5   | 23  | -   | -   | 4   | - |
| 19/20  | 2   | 23  | -   | -   | 2   | - |
| 20/21  | 6   | 23  | 1   | -   | 4   | - |
| 22/23  | 6   | 23  | -   | -   | 3   | - |
| 26/27  | 6   | 23  | -   | -   | 3   | - |
| 28/29  | 3   | 23  | -   | -   | -   | - |
| 29/30  | 2   | 23  | -   | -   | 1   | - |
| 30/31  | 3   | 23  | 2   | -   | 1   | - |
| 31/Sep. 1  | 3   | 23  | -   | -   | -   | 1 |
| SEPT. 1941.  |     |     |     |     |     |   |
| 7/8  | 7   | 23  | 5   | 1   | 5   | 1 |
| 11/12  | 2   | 23  | -   | -   | -   | - |
| Two Havocs operated from St. Eval against Lannion; one failed to return. An e/a bombed while taking off at Gilze-Rijen. Weather bad. |     |     |     |     |     |   |
| C/f  | 453 |     | 299 | 18  | 229 | 9 |

| B/f.           | 453 |     | 299 | 18 | 229 | 9 |  |
|----------------|-----|-----|-----|----|-----|---|--|
| SEPT. 1941.    |     |     |     |    |     |   |  |
| 13/14          | 5   | 23  | 4   | 1  | 2   | - | An e/a attacked seen to dive steeply at 600 feet; another damaged.             |
| 15/16          | 5   | 23  | 1   | -  | 3   | - | E/a seen was attacked and claimed as damaged.                                  |
| 16/17          | 6   | 23  | 3   | -  | 1   | - | -  |
| 20/21          | 3   | 23  | -   | -  | 1   | - | -  |
| 27/28          | 1   | 23  | -   | -  | 1   | - | -  |
| 28/29          | 2   | 247 | -   | -  | -   | - | Hurricanes patrolled Lannion and Morlaix: no result.                           |
| 29/30          | 2   | 23  | -   | -  | 2   | - | Havocs from St. Eval bombed on or near aerodromes at Lannion and Morlaix.      |
| 30/1.          | 4   | 23  | -   | -  | 2   | - | A Havoc from Predannack bombed Lannion.  |
| 30/Oct. 1.     | 2   | 247 | -   | -  | -   | - | Hurricanes patrolled Lannion and Morlaix.                                      |
| OCTOBER 1941.  |     |     |     |    |     |   |  |
| 2/3            | 5   | 23  | -   | -  | 4   | - | -  |
| 3/4            | 4   | 3   | -   | -  | -   | - | Hurricanes fired at installations on and near aerodrome at Mardyck.            |
| 10/11          | 4   | 23  | 12  | 1  | 3   | - | Aircraft bombed on ground at Eindhoven and one claimed as destroyed.           |
| 11/12          | 4   | 23  | 1   | -  | 2   | - | -  |
| 12/13          | 1   | 23  | -   | -  | 2   | - | -  |
| 16/17          | 1   | 23  | -   | -  | -   | - | -  |
| 21/22          | 6   | 23  | -   | -  | 6   | - | -  |
| 22/23          | 2   | 23  | -   | -  | -   | - | Weather bad.   |
| 26/27          | 2   | 23  | -   | -  | 3   | - | -  |
| 28/29          | 3   | 23  | -   | -  | 3   | - | -  |
| 29/30          | 1   | 247 | -   | -  | -   | - | Hurricane from Predannack visited Rennes, Morlaix and Lannion.                 |
| 31/Nov. 1.     | 2   | 247 | -   | -  | -   | - | Hurricanes visited Morlaix and Lannion.  |
| NOVEMBER 1941. |     |     |     |    |     |   |  |
| 1/2            | 5   | 23  | 2   | -  | 1   | - | First patrol by a Boston; rest by Havocs                                       |
| 1/2            | 2   | 247 | -   | -  | -   | - | Hurricanes from Predannack visited Morlaix and Lannion; unable to find Rennes. |
| 6/7            | 2   | 23  | 2   | -  | 1   | - | -  |
| 7/8            | 6   | 23  | -   | -  | 4   | - | -  |
| 8/9            | 1   | 23  | -   | -  | -   | - | Havoc tried to locate base or bases of aircraft attacking Dover.               |
| C/f            | 534 |     | 324 | 20 | 270 | 9 |  |

| B/f.   | 534 | 324 | 30  | 270 | 9   |    |
|--|-----|-----|-----|-----|-----|----|
| NOVEMBER 1941.   |     |     |     |     |     |    |
| 15/16  | 2   | 23  | -   | -   | -   | -  |
| 17/18  | 1   | 23  | -   | -   | 1   | -  |
| 23/24  | 4   | 23  | 5   | -   | 3   | -  |
| 25/26  | 2   | 23  | -   | -   | 1   | -  |
| 25/26  | 2   | 247 | -   | -   | -   | -  |
| Several airborne S/Ls. seen.                                   |     |     |     |     |     |    |
| Weather bad.   |     |     |     |     |     |    |
| Hurricanes from Predannack visited Morlaix and Lannion.        |     |     |     |     |     |    |
| DECEMBER 1941.   |     |     |     |     |     |    |
| 1/2  | 1   | 247 | -   | -   | -   | -  |
| Weather bad: Hurricane from Predannack failed to find Morlaix. |     |     |     |     |     |    |
| 7/8  | 3   | 23  | 6   | 1   | 2   | -  |
| E/a attacked seen to dive in flames.                           |     |     |     |     |     |    |
| 8/9  | 2   | 23  | 6   | -   | 1   | -  |
| An e/a attacked and claimed as damaged.                        |     |     |     |     |     |    |
| 11/12  | 2   | 23  | 1   | -   | -   | -  |
| An e/a attacked.   |     |     |     |     |     |    |
| 11/12  | 1   | 151 | -   | -   | -   | -  |
| Hurricane patrolled Gilze-Rijen.                               |     |     |     |     |     |    |
| 12/13  | 4   | 23  | 8   | -   | 4   | -  |
| 15/16  | 1   | 23  | 1   | -   | 1   | -  |
| 15/16  | 1   | 253 | -   | -   | -   | 1  |
| This Hurricane failed to return.                               |     |     |     |     |     |    |
| 16/17  | 3   | 23  | -   | -   | 2   | -  |
| 16/17  | 2   | 1   | -   | -   | -   | -  |
| Hurricanes: uneventful.  |     |     |     |     |     |    |
| 17/18  | 3   | 23  | 8   | -   | 3   | -  |
| An e/a attacked.   |     |     |     |     |     |    |
| 25/26  | 1   | 23  | -   | -   | -   | -  |
| 28/29  | 4   | 23  | 2   | -   | 2   | -  |
| Totals for 1940/1941.  | 573 |     | 361 | 21  | 290 | 10 |

N.B. The above figures exclude the small number of offensive operations undertaken at night against objectives other than aerodromes, by squadrons other than No.23.

OPERATION "INTRUDER":SUMMARY OF SORTIES AND CLAIMS, BY MONTHS.

1940 - 1941

| MONTH            | No. of Nights:     |          |              | No. of Sorties by: |        |         |            |          | All types | Claims and Losses |                      |                          |              |
|------------------|--------------------|----------|--------------|--------------------|--------|---------|------------|----------|-----------|-------------------|----------------------|--------------------------|--------------|
|                  | Operation executed | E/a seen | E/a not seen | Elenheims          | Havocs | Bostons | Hurricanes | Defiants |           | No. of e/a seen   | No. of e/a destroyed | No. of aerodromes bombed | Our a/c lost |
| 1940<br>December | 3                  | 2        | 1            | 14                 | -      | -       | -          | -        | 14        | 7                 | -                    | 13                       | 1            |
| 1941<br>January  | 7                  | 3        | 4            | 23                 | -      | -       | -          | -        | 23        | 11                | -                    | 13                       | 2            |
| February         | 6                  | 2        | 4            | 8                  | -      | -       | -          | -        | 8         | 19                | -                    | 3                        | -            |
| March            | 11                 | 8        | 3            | 49                 | -      | -       | 2          | -        | 51        | 51                | 3                    | 28                       | 2            |
| April            | 16                 | 7        | 9            | 33                 | 16     | -       | 2          | 6        | 57        | 33                | 2                    | 17                       | 1            |
| May              | 13                 | 10       | 3            | 1                  | 56     | -       | 11         | 9        | 77        | 128               | 11                   | 38                       | -            |
| June             | 14                 | 3        | 11           | -                  | 48     | -       | 6          | -        | 54        | 4                 | 1                    | 19                       | -            |
| July             | 18                 | 4        | 14           | -                  | 87     | -       | 8          | -        | 95        | 14                | -                    | 56                       | -            |
| August           | 17                 | 5        | 12           | -                  | 61     | -       | 4          | -        | 65        | 27                | -                    | 37                       | 2            |
| September        | 10                 | 4        | 6            | -                  | 35     | -       | 4          | -        | 39        | 13                | 2                    | 17                       | 1            |
| October          | 12                 | 2        | 10           | -                  | 28     | -       | 7          | -        | 35        | 13                | 1                    | 23                       | -            |
| November         | 8                  | 3        | 5            | -                  | 21     | 2       | 4          | -        | 27        | 9                 | -                    | 11                       | -            |
| December         | 10                 | 7        | 3            | -                  | 22     | 1       | 5          | -        | 28        | 32                | 1                    | 15                       | 1            |
| Totals:          | 145                | 60       | 85           | 128                | 374    | 3       | 53         | 15       | 573       | 361               | 21                   | 290                      | 10           |