

~~RESTRICTED~~

R.A.F. NARRATIVE

# THE R.A.F. IN MARITIME WAR

VOLUME I

THE ATLANTIC AND HOME WATERS  
THE PRELUDE

April 1918 to September 1939

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Air Historical Branch (1)  
Air Ministry

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R.A.F. NARRATIVE

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VOLUME I

THE ATLANTIC AND HOME WATERS - THE PRELUDE

1918 to 1939

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FOREWORD

A successful maritime strategy has been for hundreds of years the essential guarantee of our continued existence as a nation. Up to the First World War this had been achieved by forces of ships, both war and merchant, in direct action at sea with the consequent ability to ensure our supplies, prevent invasion and land military expeditions where required. In 1914, for the first time in history, the submarine and its natural enemy the aircraft took a part in war. Henceforth the growing air forces were integrating into Sea War no less than into Land War until by 1918 a full grown maritime air power had been developed.

It is my task in these five volumes to recount the Royal Air Force in Maritime War in the Atlantic and Home Waters from 1918 to 1945. I must therefore go back to the First World War to trace the growth of this maritime air power which in April 1918 was handed over to the Royal Air Force and this is done in Chapter II. Before attempting this I have thought it necessary to give a brief account, in Chapter I, of the sequence of events, both political and administrative, which led to the creation of this new Service.

When, on 1 April 1918, the two flying services were officially amalgamated there was of course no change in operational policies. As far as the Sea War was concerned the new Air Council and Air Staff continued in consultation with the Admiralty to direct the course of maritime air operations in unbroken sequence. The significance lay in the fact that maritime air power, which had been built up by the Royal Naval Air Service in integration with the Admiralty over the past  $3\frac{1}{2}$  years was now wielded by a part of the Royal Air Force and it is from this date that the story of their part in Maritime War starts.

The subsequent chapters deal with the peace years during which there was a decline in the means to exercise maritime air power which resulted in a state of unpreparedness in 1939 when war was once more imminent.

D. V. PEYTON-WARD

CHAPTER I

EVENTS LEADING TO THE CREATION OF THE ROYAL AIR FORCE

(i) The start of separate Air Services

In November 1911, the Prime Minister requested the standing Sub-committee of the Imperial Defence Committee to consider, under the chairmanship of Lord Haldane, the future development of aerial navigation for naval and military purposes and the measures which might be taken to secure to this country an efficient aerial service. The chief of their recommendations were:-

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pp. 198, 199

- (1) The creation of a British Aeronautical Service, to be regarded as one and to be designated "The Flying Corps".
- (2) The Corps to consist of a Naval Wing, a Military Wing, and a Central Flying School for the training of pilots.
- (3) The Flying Corps to be kept in the closest possible collaboration with the Advisory Committee for Aeronautics and with the Aircraft Factory so that the work of experiment and research should have its due influence on practice.
- (4) A permanent consultative committee, named The Air Committee, to be appointed to deal with all aeronautical questions affecting both the Admiralty and the War Office.

A detailed scheme to give effect to the above was completed by a technical Sub-committee and approved by the Imperial Defence Committee by 25 April 1912. Having been authorised by Royal Warrant on 13 April, the Royal Flying Corps was constituted on 13 May 1912.

ibid  
P. 207

Almost immediately the diverse aims of the two Wings resulted in a drift apart. The Admiralty took steps to set up a new department to supervise the Naval Wing and appointed Captain Murray Sueter as Director of the Air Department. The earlier Naval Flying School under Commander C. R. Samson was supposed, under the terms of the Royal Flying Corps Warrant, to merge into the Central Flying School but it continued to function independently for the training of naval flying officers.

The Air Committee first met in July 1912 and consisted of:-

- Colonel J. E. B. Seely, Secretary of State for War - Chairman
- Sir John Jellicoe, Second Sea Lord - later became Vice-Chairman
- The Director of Military Training - War Office
- The Director of the Air Department - Admiralty
- The Commanding Officers of the Naval Wing, the Military Wing, and the Central Flying School
- The Superintendent of the Royal Aircraft Factory.

This Committee had no executive power and decisions on policy still rested with the Admiralty and War Office. It was thus

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p.273

little more than a debating society in which opinions were exchanged. By the summer of 1914 the divergence of the two Wings was complete and on 1 July the Naval Wing officially became the Royal Naval Air Service under Admiralty control leaving the Military Wing to continue as the Royal Flying Corps under the War Office.

(ii) The outbreak of War and the formation of the Joint War Air Committee

ibid  
pp.417-423

When war came, the Expeditionary Force took with them four squadrons of aeroplanes which represented almost the entire operational strength of the Royal Flying Corps. Left behind in England were 116 discarded and obsolete aircraft with an assemblage of some 300 half trained personnel. The man appointed on 7 August 1914 to command this remnant of the Military Wing - Major Hugh Montague Trenchard - was destined to exert an influence in air matters which cannot be exaggerated.<sup>(1)</sup>

Even before the war the naval and military wings were rivals for the limited output of aircraft. There were no more than a dozen manufacturing firms outside the Royal Aircraft Factory. Such a situation was not new to the Admiralty who had always contracted out most of their warship construction. Their policy was to buy airframes, engines and spares in any available market, be it British or French. With their extensive experience allied to a larger monetary allotment for air development the Admiralty had already outdistanced the War Office who were new to this technique and who were mainly dependent on the output from nationalised sources. Under the rapidly increasing demands for different types of aircraft the War Office was compelled to enter the private market to an increasing degree. The inevitable result was that the authority which most clearly knew what it wanted, and could pay for it, got the pick of a small market. The need for a controlling body was thus felt at a very early stage.

The War in  
the Air  
ibid  
pp.425, 426  
and  
Vol.III p.259

Soon after the outbreak of war the Air Committee faded out as even a shadowy means of advising on the rival claims and for a time personal co-operation between the Director of Military Aeronautics and the Admiralty Director of the Air Department secured an allocation of aeroplanes and engines between the two Air Services. Provisionally it was agreed that all landplanes available in the United Kingdom should at once be allotted to the War Office and all seaplanes to the Admiralty. So long as the supply problem was confined to existing production there was little cause for friction; for instance in early December 1914, on appeal from the War Office the Admiralty handed over a further 18 landplanes just completed followed at intervals by another 80 in the next six months together with 100 American Curtiss machines built and building to an Admiralty order.

Vol.I  
pp.474, 475

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(1) He set to work and organised, trained and created new squadrons. He initiated the formation of squadrons into Wings and took command of the First Wing in France on 18 November 1914. Afterwards in August 1915 he succeeded General Henderson in command of the R.F.C. in France with the rank of Brigadier General.

Vol. III  
p. 264

However, when it came to the planning and ordering for the future there was increasing rivalry between the two air services both for British production and French (on which we were still largely dependent even in 1916). Regarding the French industry an attempt was made in January 1916 to lessen this friction when a joint naval and military commission was set up in Paris under the direction of the British naval attache.

ibid  
pp. 268-270

Early in 1916 there were strong expressions in Parliament that there should be an Air Minister in entire control of the air services with status equal to that of the First Lord of the Admiralty and of the Secretary of State for War but this opinion was in advance of Whitehall and on 15 February 1916 the Prime Minister (Mr. Asquith) was content to appoint a new committee, known as the Joint War Air Committee, under the chairmanship of Lord Derby to collaborate in and co-ordinate the question of supplies and design for material for the Naval and Military Air Services.(1) It was a strong committee but it lasted barely two months because it had no executive powers and no authority to resolve conflicting policies between the two Services. Apart from this major reason, given in his letter of resignation, Lord Derby stated that it was quite impossible in his view to bring the two sides close together unless and until the whole system of the air services was changed and they were amalgamated into one Air Service as he personally considered they ultimately must be but, though difficult even in peace time, he thought it practically impossible in war time.

(iii) The first Air Board

ibid  
pp. 271-273

Lord Curzon, the Lord President of the Council, took up the question and after exploring all possible solutions he recommended that an Air Board be created with greatly increased functions as a preliminary to an Air Ministry. Mr. Balfour, speaking for the Admiralty, opposed any derogation of the Navy's right to be master in its own house which included all naval aviation matters. The whole subject was debated in the War Committee on 11 May 1916 and it was decided to set up an Air Board of which the president must be a Cabinet Minister, two naval representatives of whom one must be either a member of the Board of Admiralty or always present at its meetings when air matters were discussed, two military representatives of whom one must be a member of the Army Council, a member of independent administrative experience, and a parliamentary representative in the other House to the President. Unfortunately in its constitution this Board also had no executive powers and, although charged with the duty of organising the supply of material and preventing competition, it had no authority to lay down policy on which the nature of aircraft orders placed must depend.

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(1) In addition to the Chairman the other members were:-  
Lord Montagu of Beaulieu } Independent adviser  
Rear-Admiral C. L. Vaughan-Lee }  
Commodore Murray Sueter } Admiralty  
Squadron Commander W. Briggs } representatives  
Major General Sir David Henderson } War Office  
Lieut.-Colonel E. L. Ellington } representatives  
Sir Maurice Hankey } both of the Imperial } Secretaries  
Major C. L. Storr } Defence Committee }

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4.

Lord Curzon was appointed as President<sup>(1)</sup> and at the first meeting of the Board on 22 May 1916 he made it clear that he took a very wide view of its duties and expected ultimately to have to advise the Government on the creation of a larger body to deal with questions of the air and the formation of a separate Air Service. It is hardly surprising that the minutes of subsequent meetings reveal growing divergences of opinion culminating in October in an open breach between the Board and the Admiralty. Lord Curzon's report on this was bitterly opposed by Mr. Balfour, the First Lord, and ill feeling became rampant between the Services in Whitehall circles.

ibid  
pp.276-278

A typical example of the Board's anomalous position came later in October. Colonel Barès, representing the French Air Service, attended a meeting at the Admiralty on 22 October and pleaded the great importance of bombing operations against German industry. This was in complete agreement with Admiralty views and their current venture in long range bombing by No. 3 Naval Wing from Luxeuil near Nancy.<sup>(2)</sup> Operations by this Wing had already been held up since May by the voluntary surrender to the R.F.C. of two thirds of their aeroplanes and the Admiralty now put a memorandum before the Air Board requesting that it be laid down that the Navy should keep an effective force of at least 200 bombers in France (including Dunkirk) and to implement this policy some 1,000 engines would be required. Sir David Henderson strenuously resisted this proposal which also drew a strong letter of protest on 1 November 1916 from Sir Douglas Haig the C-in-C., British Army in France. His view was that, until he had sufficient R.F.C. strength on the Western Front to ensure adequate air co-operation, the bombing of Germany was in the nature of a luxury.

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ibid  
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No decision had been reached by 20 November when a letter arrived from Sir Douglas Haig asking for twenty extra fighter squadrons. The matter was anxiously debated by the Air Board and on 11 December their meeting was attended by Major General Trenchard who made it clear that the R.F.C. squadrons already promised for the coming winter would not be enough and in addition there was an insufficiency of spares. The Air Board put the matter before the Admiralty who then agreed to place four additional squadrons at the disposal of the R.F.C. and to surrender 55 of the 100 Rolls-Royce engines on demand together with 60 complete Spad aeroplanes from their contract of 120.<sup>(3)</sup>

ibid  
p.280

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- (1) The other members were:-  
Rear-Admiral F. C. T. Tudor (Third Sea Lord)  
Rear-Admiral C. L. Vaughan-Lee (Director of Naval Air Service)  
Lieut.-General Sir David Henderson (Director General of Military Aeronautics)  
Brigadier General W. S. Brancker (Director of Army Air Organisation)  
Lord Sydenham  
Major J. L. Baird, M.P.
  - (2) An account of this venture is given in Chapter II (viii).
  - (3) These transfers resulted in considerable reductions in naval air stations at home and ultimately enforced the disbandment of No. 3 Wing at Luxeuil.

(iv) The Second Air Board

On 7 December 1916, Mr. Lloyd George succeeded Mr. Asquith as Prime Minister and among other changes he formed a compact War Cabinet in place of the much larger War Committee. At a War Cabinet meeting on 22 December it was decided that the Powers of the Air Board should be widened. A virtually new Board was constituted in which the President was deemed to be a Minister and the Air Board a Ministry. Lord Cowdray was appointed President and held the first meeting on 3 January 1917. Its constitution was defined by an Order in Council dated 6 February 1917(1) and it became in effect a Ministry of Supply and as such was eminently successful in that it eliminated competition between the two air services and, in co-ordination with the Ministry of Munitions, rationalised the programmes for air expansion but it still had no control over the policy or uses to which the aircraft were put.

It was, however, some time before measures taken by this organisation could bear fruit and in spite of the assistance rendered by the R.N.A.S. the supply problem for the R.F.C. in France was acute in the early part of 1917. Actually on 9 April there were no more than 50 operational squadrons with the Army in France including the four attached R.N.A.S. squadrons and another naval squadron was transferred in June just before the start of the Ypres Offensive.

By July 1917 Lord Cowdray, looking at his paper schedules of aircraft production, could see a considerable surplus of aircraft above what would be required to meet the essential needs of the navy and of the army. In his view this surplus should constitute a bombing force which could be put to effective use only if the Air Board possessed a war staff. When this proposition was put to the Board it was bluntly stated by both the Army and Navy members that if the Board took upon itself to say what were the uses to which aeroplanes or sea-planes should be put, the War Office and the Admiralty would resent and resist such intervention. However, almost at that moment the matter was being taken out of the Board's hands.

(v) The effects of the first daylight air raids on London

Only two daylight attacks on London were made by Gotha landplanes - 13 June and 7 July 1917. The effects were out of all proportion to any damage or loss of life inflicted. The air defence was negligible and the public outcry was so serious that the Government had to order the recall from the Western Front of two first class R.F.C. fighter squadrons and to divert to Home Defence all the new aircraft promised for

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- (1) The composition of the Second Air Board was:-
- |   |                              |                  |
|---|------------------------------|------------------|
| Viscount Cowdray.....                   | President                    |                  |
| Major J. L. Baird.....                  | Parliamentary Secretary      |                  |
| Commodore Godfrey Paina.....            | Fifth Sea Lord               |                  |
| Lieut.-General Sir David Henderson..... | Director General of          | } Ministry<br>of |
|   | Military Aeronautics         |                  |
| Mr. William Weir.....                   | Controller of                | } Ministry<br>of |
|   | Aeronautical Supplies        |                  |
| Mr. Percy Martin.....                   | Controller of Petrol Engines | } Munitons       |
| Sir Paul Harvey and Mr. McAnally.....   | Secretaries                  |                  |

reinforcement to the Army in France. This at a time when the Army was desperately short and about to start an offensive in Flanders. It certainly lent colour to the belief that the bombing of important homeland centres might have significant strategic results independently of any other war operations.

This hasty decision was, in itself, of little use. Field Marshal Lord French, who was in command of the Home Defence Forces, pointed out that such diversion of fighter aircraft would still leave wholly inadequate air forces with which to meet any repetition of these air raids. In fact we had not enough aircraft to meet our requirements. The Chief of the Imperial General Staff, Sir William Robertson, obtained War Cabinet approval for the doubling of the strength of the R.F.C. with a corresponding expansion in the R.N.A.S. but this was no immediate answer to the situation neither did it go to the root of the matter. In a letter to Sir Douglas Haig he said "the Army and Navy now say what they want, the Air Board considers their wants, and finally the Ministry of Munitions makes the machines. I am inclined to think that we need a separate air service."

(vi) The Smuts Reports in favour of a separate Air Force

Home Defence had ceased to be a "side show" and now took rank as a major concern of British Strategy alongside the Anti-U-boat Campaign and the Western Front. The Government set up a committee on 11 July 1917 to examine, in consultation with representatives of the Admiralty, the General Staff and the C.-in-C. Home forces with such other experts as were desired, the following:-

1. The defence arrangements for home defence against air raids.
2. The air organisation generally and the higher direction of air operations.

The chairman of the Committee was the Prime Minister (Mr. Lloyd George) but he was too occupied to give more than the prestige of his name and the Committee was really a one-man affair and that one man was Lieut.-General J. C. Smuts, selected for his non-political outlook, unbiased opinion and absolute honesty. After hearing expert evidence, his first report dealing with Home Defence was presented on 19 July 1917. Briefly, it recommended that an anti-aircraft gun barrage covering London should be established and three new fighter squadrons trained to fight in formation be made ready as rapidly as possible. For the organisation it recommended that a senior officer of air experience should have executive command, under Lord French, of the whole defences of the London area which were to include all fixed and mobile guns and searchlights in the London, Harwich, Thames, Medway and Dover areas, the existing six R.F.C. home defence squadrons, and all the Observer Corps stations east of a line between Grantham and Portsmouth. This report received Cabinet approval later in July.

His second report dealing with air organisation and higher direction was placed before the War Cabinet on 17 August 1917. In it he expressed the view that the air service had outgrown the ancillary and subordinate role of its infancy and was capable of acting extensively on its own.

ibid  
Vol.V  
p.40

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the Air  
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There followed the prophetic utterance "As far as can at present be foreseen there is absolutely no limit to the scale of its future independent war use. The day may not be far off when aerial operations with their devastation of enemy lands and destruction of industrial and populous centres on a vast scale may become the principal operation of war, to which the older forms of military and naval operations may become secondary and subordinate ....." He went on to say that the recently approved programmes for air expansion would result in a future surplus of aeroplanes after the requirements of the army and of the navy had been met and the creation of an Air Staff to plan and direct independent operations was urgent. The design of aircraft and engines for such operations must be settled in accordance with the policy which would direct their future strategic employment, a fact which made equally urgent the need to form an Air Ministry. On the question as to whether the Navy and the Army should retain their own special air services in addition to the air forces controlled by the Air Ministry, he was adamant that this would make confusion hopeless and render the solution of the air problem impossible. The maintenance of three Air Services was out of the question. The only possible course was to establish one Unified Air Service which would absorb the existing services under arrangements which would fully safeguard the efficiency and secure the closest intimacy between the Army and the Navy and the portions of the Air Service allotted or seconded to them. In this respect he said it was necessary for all Air units detailed for naval and military work to come directly under the orders of the naval or army commanders of the forces with which they were associated. While realising that for some years to come the Air Service would be largely dependent on the officers of the Navy and Army who were already employed in air work, it was necessary in the future for a considerable number of regular officers of both the older Services to be seconded to the Air Service for definite periods (not less than four or five years) so that they could utilise to advantage the contingents of the Air Force put at their disposal. He ended by pointing out "how undesirable it would be to give too much publicity to the magnitude of our air construction programme. It was important for the winning of the war that we should not only secure air predominance but secure it on a very large scale and having secured it we should make every effort and sacrifice to maintain it for the future. Air supremacy may in the long run become as important a factor in the defence of the Empire as sea supremacy." From both these points of view it was necessary that not too much publicity be given to the plans and intentions and "the necessary measures should be defended on the grounds of their inherent and obvious reasonableness and utility, and because of the desirability of preventing conflict and securing harmony between naval and military requirements."

ibid

ibid

It will be noticed that this very important report was concerned with three major objectives:-

1. The creation and direction of an Independent Force for strategic bombing.
2. The reorganisation, concentration and direction of all aviation under a separate and autonomous Air Service.

3. The concealment of true plans and intentions by directing publicity to the desirability of preventing conflict and securing harmony between naval and military requirements.

Regarding the latter, publicity was only too well so directed and gave rise to the widely held myth, still prevalent, that the Royal Air Force was only created to stop the bickering between the Army's Royal Flying Corps supposedly fighting for its life in France and the Admiralty's Royal Naval Air Service lolling at home in the luxury of unlimited air supplies.

On 24 August the War Cabinet accepted the recommendations for a separate Air Service and appointed a Committee under Lieut.-General Smuts to work out the details of amalgamation.<sup>(1)</sup> This body was known as the Air Organisation Committee. Sir Douglas Haig was distinctly lukewarm about some of the recommendations and thought that the future for strategic bombing was unsupported at present by fact. He was sceptical about there being any surplus of aircraft with which to attempt it observing that his own needs of aircraft were still very far from being met nor was it clear that his wastage rate had been allowed for.

(vii) The creation of an independent bombing force

Following the improvement in the Home Air Defences put in train after Smuts' first report in July, no Gotha raids reached London and were confined during August to diminishing attacks in the extreme south-eastern areas of Kent and Essex. Finally at the end of the month the enemy gave up daylight operations and took to moonlight night air raids. The first of these to reach London was during the night of 4/5 September 1917. The defences at night were once more powerless and public opinion was again inflamed, this time demanding retaliation against German cities. The War Cabinet instructed Lieut.-General Smuts to explore the question of counter-bombing attacks and Major General Trenchard was sent home from France to help in the consultations. As an immediate measure a bombing Wing (No.41) was organised to operate from Ochey near Nancy.<sup>(2)</sup> Originally it consisted of three squadrons with the intention of a rapid increase in strength. But there was no promised surplus of aircraft with which to build this little detachment into a properly constituted long range bombing force. The Cabinet appointed yet another committee to make recommendations about priorities in aircraft production. This was the Aerial Operations Committee under the chairmanship of Lieut.-General Smuts<sup>(3)</sup>. At their first meeting they agreed to ask for additional power to settle priorities for all munition programmes and not only

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- (1) The other members were Lord Cowdray, Major Baird, M.P., Commodore Godfrey Paine, Sir David Henderson and Lord Hugh Cecil.
  - (2) An account of the independent bombing operations is given in Chapter II (xix)
  - (3) The other members were:-  
Sir Eric Geddes..... First Lord of the Admiralty  
Lord Derby..... Secretary of State for War  
Lord Cowdray..... President of the Air Board  
Mr. Winston Churchill..... Minister of Munitions.

Vol.VI  
App.III

ibid  
Vol.V  
pp.90, 91

ibid  
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p.17

for air production. This was granted and from 8 October 1917 the Committee was known as the War Priorities Committee.

(viii) Delays before the passing of the Air Force Act

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pp. 18, 19

Meanwhile there was delay in any publication of the Government's intention to form a separate air service. The continued night raids by Gothas on south-eastern England and London in particular kept public criticism inflamed at the apparent lack of any active policy. Misgivings spread to those in close touch with the Government. A member of the Air Board (Admiral Mark Kerr) addressed a forceful memorandum to Lord Cowdray in which he foreshadowed a far heavier bombing campaign against England and pointed out "the extraordinary danger of delay in forming the Air Ministry and commencing on a proper Air Policy." This paper was circulated amongst the War Cabinet and eventually on 15 October the Cabinet, still fearful of taking the plunge, appointed an Air Policy Committee, again under Lieut.-General Smuts' chairmanship, to advise the Cabinet pending the establishment of an Air Ministry.(1) Further criticism of this hesitancy came on 26 October from Lord Milner(2) in a memorandum stating "Ministry or no Ministry, an Air Staff is the urgent necessity" and went on to declare that the Air Policy Committee could not possibly perform the task of constantly reviewing air policy, co-ordinating the requirements of the Army and the Navy, and devising the best methods of offense and defence in the new art of independent aerial warfare.

ibid  
p. 21

However, nothing was done until 6 November when the War Cabinet approved the draft of the Air Force Bill which had been completed by the Air Organisation Committee and decided to lay it before Parliament. On 16 November occurred an unfortunate incident. Mr. Lloyd George had privately offered the new post of Secretary of State for Air to Lord Northcliffe. The latter published a letter in the Times newspaper giving his reasons for declining the offer. Lord Cowdray read this letter with a shock as he had assumed that as President of the Air Board he would continue to be the responsible Minister when the Air Board was duly enlarged into an Air Ministry. His position now had become difficult and he therefore resigned.

ibid  
pp. 22, 23

Lord Cowdray was succeeded as President of the Air Board by Lord Rothermere on 23 November. Meantime the Air Force Bill had been introduced in Parliament, was passed and received Royal Assent on 29 November 1917. Orders in Council were issued on 21 December and 2 January 1918 defining the composition and duties of the Air Council which came into being on 3 January with Lord Rothermere as the first Secretary of State for the Air Force and

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- (1) The other members were:- The First Lord of the Admiralty, the Secretary of State for War and the President of the Air Board. Various officers, including Major-General Trenchard, were called by the Committee from time to time for advice.
  - (2) Lord Milner was a member of the War Cabinet without portfolio.

Major-General Sir Hugh Trenchard as the first Chief of the Air Staff.(1) Sir Douglas Haig was extremely critical of the decision to take Sir Hugh Trenchard away from his command in France and openly stated that his removal from active command in the field would directly impair the offensive fighting efficiency of the Royal Flying Corps. Happily this did not occur but it shows in what high esteem he was held on the Western Front.

(ix) The Royal Air Force comes into being

The new Air Council had a difficult and complex task. It had to assemble and organise the necessary administrative and technical staffs, to take over the duties which had been the concern of the Air Policy Committee, and to take all the essential steps for the amalgamation of the two flying Services into the Air Force.(2) Enough had been done towards the end of March to make it possible for an announcement that on 1 April 1918 the Royal Air Force would officially come into being as a separate Service.(3)

Unhappily the unity which at long last had been achieved between the flying services was not a feature of the first Air Council. There had already appeared grave differences of view between the Chief of the Air Staff and the Secretary of State for Air. Sir Hugh Trenchard submitted his final statement on 18 March and next day tendered his resignation. This was accepted by the War Cabinet and Major-General F. H. Sykes was appointed in his place. Then the Vice-President, Sir David Henderson, resigned on the grounds that he could not work with the new Chief of the Air Staff. Finally on 25 April Lord Rothermere resigned his appointment and was followed a few days later by Sir Henry Norman who had been appointed by Lord Rothermere as the additional member of the Air Council.

This, however, was the end of the disintegration. Lord Rothermere was succeeded as Secretary of State on 27 April by Sir William Weir and there were subsequently only minor changes. When the war ended the composition of the Air

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- (1) Members of the first Air Council:-  
Lord Rothermere.....Secretary of State for the Air Force  
Major J. L. Baird...Parliamentary Under Secretary of State  
Lieut.-General Sir David Henderson.....Additional member  
and Vice-President  
Major-General Sir Hugh Trenchard...Chief of the Air Staff  
Rear-Admiral Mark Kerr.....Deputy Chief of the Air Staff  
Commodore Godfrey M. Paine..Master-General of Personnel  
Major-General W. S. Brancker.....Controller-General of  
Equipment  
Sir William Weir ....Director General of Aircraft  
Production in the Ministry of Munitions.  
Sir John Hunter..Administrator of Works and Buildings.
- (2) A Royal Proclamation was published on 7 March 1918 giving approval to the title "Royal Air Force".
- (3) It should be noted that airships remained under Admiralty administration until after the war.

Council was as under:-

Lord Weir of Eastwood - Secretary of State for Air

Major J. L. Baird, M.P. - Parliamentary Under Secretary  
of State

Major-General F. H. Sykes - Chief of the Air Staff

Major-General W. S. Brancker - Master-General of  
Personnel

Major-General E. L. Ellington - Controller-General of  
Equipment

Major-General Sir Godfrey Paine - Inspector-General of  
the R.A.F.

Sir Arthur Duckham - Director-General of Aircraft  
Production (in the Ministry of  
Munitions)

Sir John Hunter - Administrator of Works and Buildings

W. A. Robinson, Esq. - Secretary

## CHAPTER II

THE GROWTH OF MARITIME AIR POWER<sup>(1)</sup>1914 to 1918(i) Developments prior to August 1914

When the Royal Flying Corps was instituted in April 1912, the Army already had a clear cut requirement for the aeroplane in war. This was for reconnaissance in the field of Army operations and consequently the Military Wing was developed entirely with this end in view. The later additions of prevention of enemy scouting, artillery spotting and ground support to troops merely accentuated the essential short range nature of Army co-operation.

Up to mid-1912 the technical development of neither land-plane, seaplane nor airship had advanced sufficiently to allow employment of aircraft at sea with the Fleet and naval aviation was still experimenting to find uses for the new arm. In this respect it is of lasting interest to note that as early as January 1912 a submarine officer (Lieutenant H. A. Williamson), who had gained his flying certificate, advocated in a paper the use of aeroplanes for the detection of and attack on hostile submarines, and showed how heavy bombs fuzed to explode 20 feet below the surface might be used to destroy these craft when caught on the surface. It is melancholy to reflect that it was not until 28 years later in July 1940 that such "depth charges" came into use by aircraft and not till July 1942 that the 20 foot detonation was achieved.<sup>(2)</sup>

After formation, the Naval Wing of the Royal Flying Corps was concerned with the question of the defence of our coasts against raiding sorties by enemy warships and minelaying. In October 1912 the Admiralty started to establish a chain of air stations along our east and southeast coasts and by the Spring of 1913 such stations were at Cromarty, Yarmouth, Felixstowe, King's North for airships, Isle of Grain, Eastchurch (the H.Q. and Flying School), at Calshot in Southampton Water and an old cruiser (H.M.S. Hermes) was experimentally fitted to carry two seaplanes. Later in 1913 the Admiralty took up the question of a special seaplane carrier. A cargo steamer of 7,450 tons, building at Blyth, was taken over and completely redesigned. The machinery and bridge structure were placed right aft so as to give a flying deck 130 feet long and the holds adapted into a single hangar capable of accommodating ten seaplanes. She was not launched until September 1914 and came into commission as H.M.S. Ark Royal on 9 December 1914.<sup>(3)</sup>

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See Map  
No.1

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- (1) The following references have been used in this brief account:-  
The Official Histories of the War in the Air, Vols. I to VI and Naval Operations, Vols. I to V: The R.N.A.S. in Home Waters, Parts I, II and III held in the Air Ministry Historical Branch under Index Nos. 21/13/1385, 1901, 1908 and 1930: Admiralty Monthly A/S Reports and various statistical information in the Admiralty Historical Section.
- (2) See R.A.F. in Maritime War, Atlantic and Home Waters, Vol.II App. IV and Vol.III p.81.
- (3) When the Government decided in January 1915 that the Navy should attack the Dardenelles, the Ark Royal was sent out and arrived at Tenedos on 17 February. She remained in Mediterranean waters for the rest of the war.

The Admiralty policy required in the future a fighter as well as a scouting type of seaplane to operate from a ship and landplane types for fighter and patrol duties along the coast. Much attention was given by the Admiralty's Air Department to the evolution of a long endurance airship for extended reconnaissance, a flying boat for open sea patrols and a landplane which could undertake the bombing of enemy bases. The designs of an efficient bomb sight and bomb release gear were furthered by frequent exercises and early experiments were made in the mounting of machine guns. All in all the Naval Wing was more interested in the use of landplanes as fighting machines than were the Military Wing and, of course, the training was of a specialised maritime nature.

ibid  
pp.264-270

By mid-1914 the fundamentally differing requirements had caused the two Wings to drift so far apart that on 1 July 1914 this separation was officially recognised. The Naval Wing became the Royal Naval Air Service with a constitution of its own and with special naval air ranks.(1) The flying school at Eastchurch, the air stations along the coasts and all aircraft employed for naval purposes were grouped under the control of the Central Air Office at Sheerness and administered by the Director of Air Department at the Admiralty. Henceforward the Military Wing continued as the Royal Flying Corps with the duties of army co-operation under War Office control. Just before war broke out the War Office claimed sole responsibility for all the air defence of this country. It was then estimated that this would require six squadrons totalling 162 landplanes for the protection of defended ports between Cromarty and Plymouth. When the Expeditionary Force went to France they took with them almost the whole operational strength of the Royal Flying Corps and England lay wide open to air attack. The Admiralty had perforce to shoulder this unlooked-for burden.(2)

ibid  
p.273

ibid  
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(ii) The First World War breaks out.

The first war operations by the R.N.A.S. consisted of coastal reconnaissance patrols by all types of aircraft between Kinnairds Head in Aberdeenshire to Dungeness in Kent, but after the invasion of Belgium in the opening weeks of the war these patrols were concentrated to between the Humber and the North Foreland with a temporary extension to the Belgian coast to cover the passage of the Expeditionary Force to France. The initial east coast patrols were against possible air attacks on defended ports, then against enemy surface craft minelaying which started on 8 August, and from early September the duty of watching for hostile submarines was added. During this period new air stations were opened at Killingham, Dundee and Scapa Flow.

ibid  
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(1) Wing Captain, Wing Commander, Squadron Commander, Flight Commander, Flight Lieutenant and Flight Sub-Lieutenant.

(2) The respective strengths on 4 August 1914 were:-  
R.N.A.S. - 7 airships, 52 seaplanes and 39 landplanes  
manned by 128 officers and about 700 petty officers  
and men.

R.F.C. - 179 landplanes manned by 146 officers and 1,097  
other ranks.

Of this total there went to France four squadrons totalling  
63 landplanes manned by 105 officers and 755 other ranks.

Ref: The War in the Air, Vol.I. pp.357, 411.

For the primary duty of air co-operation with the Fleet the Admiralty had on the outbreak of war taken over three 22 knot cross-Channel steamers - the Empress, Engadine and Riviera - which were fitted out to carry three or four seaplanes each. These had to be hoisted out and back again from the water when operating. For longer endurance work with the Grand Fleet the old Cunard liner Campania was purchased, reconstructed with a 120 foot flying deck and adapted to carry ten or eleven seaplanes, but she was not commissioned until May 1915.

ibid  
pp.371-376

ibid  
p.390

Meanwhile offensive action had started against the enemy in Belgium. The Eastchurch squadron (No. 3) consisting of ten assorted landplanes under Wing Commander C. R. Samson operated for a few days at the end of August from Ostend and then settled at Dunkirk with the primary duty of attacking German airship sheds.(1) More aircraft were flown across so that nominally the force consisted of Nos. 1, 2 and 3 naval squadrons of twelve landplanes each but in these early days two or three machines were often the most a squadron could muster for operations. It was aircraft from this little force who flew to an advanced airfield near Antwerp and carried out the first long range bombing raids. These were made on the Zeppelin sheds at Dusseldorf and Cologne on 22 September and 8 October 1914. On the latter date Flight-Lieutenant R. L. G. Marix destroyed the military Zeppelin Z.9 in its shed at Dusseldorf.

ibid  
p.393

The German advance through Belgium towards the coast and the enemy occupation of Ostend and Zeebrugge put an end to such operations from advanced airfields, and, after co-operating with the Army during the Ypres battle, the R.N.A.S. landplane units arrived back in Dunkirk early in November.(2) Concurrently, naval surface forces were bombarding the seaward flank of the enemy advance along the Belgian coast and in order to give air support and to patrol against enemy submarines it was decided to establish a seaplane base at Dunkirk. This was effected at the end of October by transport in H.M.S. Hermes but when returning empty to Dover she was sunk by a U-boat. The seaplanes, under Squadron Commander J. W. Seddon did good work during the next month in spotting for bombardments, patrolling the Belgian coast and bombing the initial U-boat assembly plant in Bruges.

ibid  
pp.396-398

As the Rhineland Zeppelin sheds were now outside the range of Dunkirk based aircraft, attention was directed to those remaining in reach from either France or from the North Sea. A raid was planned from France and took place on 21 November 1914 by four R.N.A.S. landplanes which had been flown down to Belfort for the purpose. The attack was made

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- (1) Not only were the Zeppelin bases attacked because of their value to enemy sea reconnaissance but the airships were an incipient bombing threat to this country, the air defence of which was now an Admiralty responsibility.
- (2) During this two month period of mobility, Wing Commander Samson organised armoured car sections manned by R.N.A.S. personnel who not only succoured aircraft forced to land near enemy-held positions but actively assisted Army operations. Later, when trench warfare had immobilised the battle front, this personnel was used to man armoured trains carrying naval guns.

on the Zeppelin sheds at Friedrichshafen on Lake Constance and was successful in inflicting considerable damage to a Zeppelin nearing completion and in destroying the hydrogen gas plant. The overseas operation was against sheds on the North German coast. The three seaplane carriers Empress, Engadine and Riviera, each with three aircraft aboard, escorted by light cruisers and destroyers proceeded across to the vicinity of Heligoland by the morning of Christmas Day 1914. Seven seaplanes were hoisted out and got away to attack sheds believed to be at Cuxhaven. No sheds were located but bombs were dropped on the port and a detailed reconnaissance made of the High Seas Fleet lying in the Schillig Roads.

(iii) The First U-boat Campaign

U-boats were now operating direct from Flanders ports and were making their presence increasingly felt by successful attacks in the eastern Channel area. An additional seaplane station was therefore opened at Dover on 21 November but the sea and air patrols proved of little value in preventing free passage by the U-boats. On 1 January 1915 the battleship Formidable was sunk with heavy loss of life off the Isle of Wight and a little later U.21 carried out an unhindered cruise into the Irish Sea. Following this demonstration of extended operational possibilities the German Admiralty on 4 February 1915 issued a declaration that from 18 February the waters around the British Isles were a war zone in which all enemy ships would be attacked and neutrals would navigate at their peril. So started the First U-boat Campaign in which merchant ship losses rose steadily per month from nine in February to over 50 in June and July.

The opening of this Campaign led to an immediate concentration of naval aircraft for the bombing of U-boat bases in Belgium. Land and seaplanes from Hendon, Eastchurch and from the carrier Empress were sent to reinforce those already at Dover and Dunkirk. Bombing attacks actually started from 11 February but the Dardanelles Campaign was beginning to draw off naval air strength and at the end of February No.3 Naval Squadron departed for this area. Their place at Dunkirk was taken by No. 1 Squadron of seven landplanes under Squadron Commander A. M. Longmore. More bombing attacks took place in March and April but with little result on U-boat operations.

Where numbers permitted, a limited amount of seaplane patrolling was done off certain stretches of coast and the obvious lack of resources stimulated the development of small airships. Experiments and trials early in 1915 produced the Submarine Scout type of small non-rigid airship known familiarly as "Blimps". The first bases for these were opened at Capel, near Folkestone, on 8 May and Polegate, near Eastbourne, on 6 July. They were followed on 15 July by others at Luce Bay and Larne for the North Channel area and at Anglesea for the Irish Sea in mid-September.

The First U-boat Campaign reached its climax in Home Waters in August 1915 when some 60 vessels of all sizes were sunk. The highlight occurred on the 19th with the sinking without warning of the liner Arabic. Earlier, in May, the sinking of the Cunarder Lusitania had strained relations between America and Germany but the loss of further American lives in the Arabic brought the two countries to the brink of war. After a violent clash between German political and naval authorities, orders were issued forbidding attacks on passenger vessels

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without previous warning. In view of increasing British surface and air patrols this curb resulted in the withdrawal by the end of September of all U-boats from the English Channel and western approaches. The Flanders U-boat flotillas continued operating off the East Coast where the unfortunate fishing fleets suffered heavily, but merchant losses fell rapidly by half in September and then almost ceased till the end of January 1916.

(iv) Action against Zeppelins

Concurrently with the First U-boat Campaign, the other threat to this country made its appearance. Military raiding Zeppelins were being housed in sheds erected in Belgium and the first skirmishing sorties to England started at the end of April.<sup>(1)</sup> Early in May Southend was attacked but the naval pilots who went up made no interception of the returning airships. The Dunkirk based landplanes went into action on 17 May and LZ.39 was severely damaged in flight when returning to Belgium. The first raid on London was made by LZ.38 on 31 May who was not intercepted but she was destroyed in her shed on 7 June by two Dunkirk aircraft. Immediately afterwards Flight Sub-Lieutenant R. A. J. Warneford engaged and destroyed LZ.37 in flight with small bombs when she was returning from an abortive raid, for which he was awarded the V.C. These losses resulted in the Belgian sheds being abandoned except for emergency landings.

ibid  
pp.358-361

Attempts to operate seaplanes from the carriers against naval Zeppelins either in flight across the North Sea or in their sheds on the North German coast met with no success. Such attempts took place twice in March, twice in May and once in July 1915. Although the naval policy against Zeppelin raids was mainly to direct attacks on their bases, measures were also taken to engage them at night above their targets. Additional stations were opened along the Yorkshire coast and landing grounds were established between the Wash and the Thames estuary to facilitate night patrols. Aeroplanes and pilots were distributed before dark to these latter ready for take off when warnings were received of Zeppelin movements. However, this night flying (up to September 1915) entailed a considerable wastage of pilots and material in crashes without any result on the enemy. In the 89 night flights carried out, twenty aircraft were wrecked, three pilots killed and eight seriously injured.

(v) The integration of the Naval Air Service into the Royal Navy

Even by January 1915 the rapidly expanding R.N.A.S. was creating problems of administration and control. Now under the stress of the U-boat and Zeppelin Campaigns, coastal air stations were multiplying and inland fighter defence stations had been established at Hendon, Chingford, Wormwood Scrubbs

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(1) Military Zeppelins were prefixed by the letters LZ, naval Zeppelins by the letter L. The first naval Zeppelin raid was from a German North Sea base on 19 January 1915 when bombs were dropped at random in East Anglia. The second naval raid was not till 14 April when one airship dropped bombs harmlessly in the Tyne area followed next night by harmless attacks in the Lowestoft area.

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and Roehampton. All were still directed by the Central Office at Sheerness, itself situated in the C.-in-C. Nore's area of command. Efficient control was no longer possible and in February the Admiralty decided to abolish the Central Air Office and bring the whole of the R.N.A.S. under the orders of the Director of Air Department. As the R.N.A.S. were recruited and administered differently to the regular Royal Navy this decision was followed by argument between the Air Department and the C.-in-C. Nore over the application of the Naval Discipline Act to the numerous units of the R.N.A.S. in his command. This relatively parochial question was overlaid by considerations of naval air policy between the new First Lord(1) and the Commander-in-Chief Grand Fleet (Sir John Jellicoe). The C.-in-C., in a memorandum dated 4 June 1915, laid down what he considered to be the functions of a Naval Air Service as follows:-

ibid  
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- (a) Observation duties from the coast generally, and from naval bases in particular.
- (b) The attack of enemy aircraft wherever met.
- (c) The aerial defence of all naval centres such as dockyards and magazines since the Army had apparently left this duty to the Navy.
- (d) Scouting for U-boats and enemy minelayers.

In discussions with Mr. Balfour in London over these and other points of policy Sir John Jellicoe agreed to Mr. Balfour's proposal to arrange for the War Office to take over the R.N.A.S.'s anti-aircraft ground defence organisation, all the R.N.A.S. armoured car squadrons and the three R.N.A.S. armoured trains operating in France. He also agreed to the proposal that the operational control of naval aviation should no longer come under the Air Department at the Admiralty but be exercised by the Senior naval officers in the areas from which they worked. In July the whole question was considered by the Board of Admiralty and regulations for the complete reorganisation of the Naval Air Service were issued, to take effect from 1 August 1915.

ibid  
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pp.485-487

Briefly, this meant that the R.N.A.S. ceased to be a naval co-operation force and became an integral part of the Royal Navy. The various air stations (now over fifty in number) were placed under the general orders of the senior naval officer in whose district they were situated and an air service officer was appointed to each as adviser on air technical matters. The post of Director of Air Department was abolished and in place a non-technical flag officer(2) was made responsible for the Naval Air Service in a newly created post of Director of Air Services while the former Director of Air Department (Commodore Murray Sueter) was freed to give his undivided time and attention to the development and supply of aircraft in the post of Superintendent of Aircraft Construction. Sweeping changes were made in the administration and construction branches so that in effect a new air service was formed in

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- (1) On 25 May 1915, the Prime Minister (Mr. Asquith) formed his Coalition Ministry with Mr. Balfour replacing Mr. Winston Churchill as First Lord and Admiral Sir Henry Jackson in place of Lord Fisher as First Sea Lord.
  - (2) Rear-Admiral C. L. Vaughan-Lee.

which there was a large proportion of regular naval officers with no special knowledge of aircraft but who brought with them powers of organisation, a strict sense of naval discipline and the pride of the ancient service to which they belonged.

The immediate and tangible results were that, in place of scattered training stations, a central training depot was set up at Cranwell in Lincolnshire with a complete system of instruction and graduation of pupils(1), a designs department was set up in Whitehall, the airship service was taken in hand for more rapid development for anti-U-boat patrol work(2) and the Dover/Dunkirk area was amalgamated under the Dover Naval Command (Admiral Bacon) who became responsible for all land and sea planes based at Dover and Dunkirk together with the S.S. airship stations at Capel and Polegate.

(vi) The expansion of the Dunkirk Force

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This formed the largest air group in the R.N.A.S. and the operational command of it was given to Wing Commander C. L. Lambe. At this time No. 2 Naval Squadron under Wing Commander E. L. Gerrard had just relieved No. 1 Squadron at Dunkirk but on 15 August they were withdrawn for service at the Dardanelles. However, during their short stay at Dunkirk, aircraft from the squadron succeeded on 10 August in so damaging naval Zeppelin L.12 in flight that it only landed with difficulty near Ostend and had to be scrapped soon after. Their place at Dunkirk was once more taken by No. 1 Squadron.

ibid  
p. 426

Soon after Wing Commander Lambe's appointment he obtained approval to combine all the aircraft at Dover and Dunkirk into one Wing - No. 1 - based at St. Pol, just west of Dunkirk. He aimed at a wing strength of eight squadrons of six aircraft each but under the constant drain to the Dardanelles area it was much later in the year before his aim was approached. Meanwhile No. 1 Squadron continued to participate in sporadic bombing attacks on German naval bases in Belgium, in support and spotting for H.M. ship bombardments in which seaplanes from the Riviera took part, and in attacks on U-boats whenever seen off the Belgian coast. One such attack was made by Squadron Commander A. W. Bigsworth on 26 August when he bombed a surfaced U-boat off Ostend from 500 feet with 2 - 65 lb. bombs. A direct hit and a very near miss were claimed. The U-boat disappeared stern first at a very steep angle but no loss was admitted by the enemy. Several other air attacks were made between September and November. None are known to have been lethal but the German U-Boat History mentions that UB.6 and UC.1 were damaged by them.

A.H.B.  
21/13/1385  
pp. 27, 28

ibid  
p. 427

By November 1915, considerable reinforcements in personnel were in sight from the retraining of officers and men released from the armoured car units and Wing Commander Lambe sought approval for a wider offensive policy including the organisation of a special bombing force. He pointed out that bombing, to

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- (1) Cranwell was not officially opened until 1 April 1916. It was under the command of Commodore G. M. Paine as H.M.S. Daedalus.
  - (2) At this time there were only a few of the S.S. non-rigid Blimps in service but there were 50 on order. It was decided to complete these but further construction should be of a larger Coastal or "C" type of greater endurance.

be effective, must not only be made in force but must also be sustained. The essential routine work of reconnaissance, co-operation with naval forces and air photography would fully occupy No. 1 Wing and he urged the formation of two additional wings for bombing purposes. He proposed that No. 4 Wing of four squadrons, under Squadron Commander C. L. Courtney, should go to the Dunkirk area from Eastchurch and that a new No. 5 Wing be created by detaching four squadrons from No. 1 Wing so that all Wings would consist of four squadrons. There would also be a squadron at Dover for local defence and training duties. Finally he proposed to alter the classification of units whereby six aircraft would henceforward form a Flight, two or three Flights form a Squadron and a Wing would be composed of a varying number of squadrons thus bringing the organisation of aircraft into line with the system in force in the R.F.C.

All these proposals were approved and Wing Commander Lambe's programme took shape early in 1916 following the release of large naval air resources after the evacuation of Gallipoli and the assumption by the War Office in February 1916 of the burden of Home Defence against air raids.

(vii) The bombing of land targets

Action by the reconstituted Dunkirk force opened in March 1916. No. 5 Wing, based at Coudekerque under Squadron Leader S. D. A. Grey, aided by French and Belgian aircraft attacked the German main airfield at Houltave, between Ostend and Bruges, while seaplanes from the Riviera, Vindex and Dunkirk attacked Zeebrugge. No. 4 Wing was not established until mid-April at their airfield at Petite Synthe. Both Wings bombed enemy airfields and other targets in Belgium on 24 April and again on the 5th and 19 May. Naval sea and landplane fighters took part as escorts to the bombers and protection against air attack was given to H.M. ships operating off the coast. When the German retaliatory bombing of the Dunkirk area started in earnest late in May, two flights of naval fighters from No. 1 Wing were established at Furnes as air defence. These flights formed the first homogeneous fighter unit of the R.N.A.S.

The lessons drawn at the time from this bombing are interesting. Wing Commander Lambe reported "that it is inadvisable to carry out offensive operations unless you have sufficient pilots and machines to continue it by day and night and also a sufficiency of fast fighting machines to prevent retaliation." In his comments Admiral Bacon said "The chief lesson learned by our airmen in Flanders is, I hope, the one which the Military have known for some time, namely, that indiscriminate bombing is useless. I intend to limit day bombing to such occasions of general attack or a general advance by the Army or to the attack of submarines and other vessels at sea. Night bombing may be useful against vessels in harbour when present in sufficient numbers to make success probable but otherwise bomb-dropping leads merely to the strengthening of anti-aircraft defences without adequate compensation." He went on to point out the urgent necessity for fighter aircraft "to drive off hostile aircraft from the north, south, east and west and the success of any operation I have in view will depend on this."

All organised bombing by the Dunkirk Force was, therefore, stopped until the beginning of August 1916 when it was resumed

in an attempt to divert enemy air activity from the Somme Front Offensive. A wider range of bombing was agreed between Lambe and General Trenchard so as to include the more distant airfields in Belgium as well as ammunition dumps, the Antwerp shipyards and Zeppelin sheds. All these targets were attacked fairly continuously during August and September. Towards the end of October a call from the Army for fighter assistance to the R.F.C. was answered by equipping from the Dunkirk Wings a squadron of eighteen experienced fighter pilots. This was known as No. 8 Naval Squadron led by Squadron Commander G. R. Bromet. They fought with the R.F.C. on the Somme Front and down to the end of December 1916 they destroyed 24 enemy planes with a loss of only two pilots.

The bombing offensive against Ostend and Zeebrugge was reopened early in November and was continued to the end of the year. Although the material damage inflicted by these raids was small, the fear of attack compelled the enemy to keep his destroyers inland at Bruges and the consequent serious delay in getting to sea down the canal had a frustrating effect on their operations, in fact one whole flotilla was sent back to Wilhelmshaven.

(viii) Long range bombing into Germany by naval aircraft

During this period a significant bombing venture was in train. The project of long distance bombing raids into Germany had, from the outbreak of war, been in the Admiralty mind but it was not till the spring of 1916 that suitable aircraft were at last forthcoming. It was arranged with the French authorities that naval bombers should work from an airfield at Luxeuil, in the Nancy area, from which were accessible many centres engaged in steel production for use in submarine construction. Captain W. L. Elder, R.N. was sent at the beginning of May to arrange for the reception of the new bombing force to be known as No. 3 Wing. It was hoped that by July it would be equipped with 35 bombing aeroplanes and 20 fighters. It was intended that this strength should gradually be increased to a total of 100 planes.

ibid  
p.452

However, an urgent plea from the R.F.C. was received in June for help to make good a deficiency of no less than twelve squadrons before the opening of the Somme Offensive. This was answered by the Admiralty at the expense of their new bombing wing. By the middle of September they had handed over 62 aeroplanes. As a result No. 3 Wing had too few aircraft to make bombing possible on any scale until October and from then until the end of the year weather seriously curtailed operations.

The first serious raid took place on 12 October on the Mauser Factory at Oberndorf. Subsequent raids up to the end of the year were made on the Thyssen Works at Hagendingen, the steel works at Volklingen, the blast furnaces of St. Ingbert and the iron works at Dillingen but the scale of attack was nothing like what had been initially envisaged, there being only a strength of 47 aircraft by the end of 1916. The weather early in 1917 continued to handicap operations but raids were made on steel works and blast furnaces on 23 January, 25 February, and the 4th and 22 March. During April there were attacks on railway junctions and on the town of Freiburg as a direct reprisal for the sinking of the hospital ship Asturias by a U-boat.

ibid  
Vol.VI  
pp.120-122

Resulting from another call at the end of 1916 for assistance to the R.F.C. the Admiralty agreed to make further transfers from the R.N.A.S. Among these was the surrender of half of a contract nearing completion of high powered engines and complete bomber aircraft. This spelt the end of the force and in May 1917 No. 3 Wing was broken up. There is no doubt that Sir Douglas Haig objected to an independent naval air detachment operating against targets of their own choosing, in fact he had said as much back in November when he wrote to the War Office pointing out the imperative need for squadrons in the battle line. Long distance bombing, he went on to say, as a means of defeating the enemy was entirely secondary to the above requirement.

In the light of fuller knowledge after the war it became clear that results were not dependent on the frequency of the raids neither should their value have been judged on purely material grounds. These first long range bombing attacks gave a severe jolt to the morale of the industrial population and had an adverse effect on the output of munitions but chiefly they compelled the enemy to divert aeroplanes, labour and materials to the beginnings of widespread schemes of home defence.

(ix) Air support to the Fleet during 1916

This requirement consisted mainly of reconnaissance in aid of the Grand Fleet when it put to sea and of action to prevent similar reconnaissance by enemy Zeppelins. The very late start in airship design in this country precluded the production of anything like the Zeppelins upon which years of development had been expended. Consequently we were limited in rapid expansion to small non-rigid types of low endurance suitable only for inshore work. The Grand Fleet had therefore to rely on carrier-borne aircraft for its requirements.

At the end of 1915 another carrier had been commissioned. This was the ex-passenger steamer Viking, renamed H.M.S. Vindex and converted to carry five seaplanes aft and two single seater fighter landplanes forward on a short flying off deck. Escorted by the Harwich force of light cruisers and destroyers, her aircraft made raids against the naval Zeppelin sheds at Hage, near Emden, in January 1916 and against those believed to be at Hoyer on the Schleswig coast in March, followed on 3 May by an attack in company with aircraft from the Engadine against those at Tondern. All were unsuccessful, either because of rough water conditions or poor visibility. In the latter attack the naval Zeppelin L.7, when reconnoitring the covering naval force, was damaged by gunfire and finally destroyed when effecting repairs on the water by submarine E.31. It was mainly owing to sea conditions and visibility that neither side were able to provide adequate air reconnaissance during the Battle of Jutland(1) nor during the subsequent August sortie of the High Seas Fleet but it could have been of decisive importance on both occasions.

(1) The Campania, carrying ten seaplanes, was through no fault of her own not present during the action. The Engadine was the only carrier with the Fleet and one of her seaplanes made a reconnaissance sighting report in the opening stages.

Ref: The War in the Air Vol. II p. 406.

The War in  
the Air Vol. II  
pp.396-398

See Map No.1

ibid  
pp.402,403

ibid  
pp.404-419

ibid  
pp.414-415

An episode of interest occurred on 2 August when the Vindex was at sea and sighted in daylight several Zeppelins returning from raiding England. A single seater fighter was flown off and engaged one of them with explosive darts but unfortunately the hits secured failed to ignite the gasbag. As a result this form of attack was abandoned in favour of incendiary bullets in the machine gun ammunition.

ibid  
pp.420-421

At the end of September a detailed air reconnaissance of the Schillig Roads was planned before sending in an attacking force of high speed torpedo-carrying motor boats.(1) This operation was notable in that a flying boat from Felixstowe was used. It was intended to put down on the water off the German coast for refuelling by a destroyer, make the reconnaissance and then again be refuelled for the return journey. Unfortunately the weather broke and the flying boat in attempting the first refuelling in a choppy sea had its wing damaged by the destroyer. This reconnaissance was attempted again in October using the Vindex and her seaplanes. The flying off and return hoisting in was completely successful but thick fog covered the Schillig Roads and nothing could be seen of the High Seas Fleet.

ibid  
Vol. IV  
pp.16-19

The advent of an operational flying boat was one of the features of 1916. This more robust form of the seaplane was initiated and developed by Commander J. C. Porte. As a retired naval officer before the war, he had worked in America with the Curtiss Company on the design of a large flying boat to be called "The America" for the first flight across the Atlantic. When war came he abandoned the enterprise, came home to join the R.N.A.S. and brought with him the first two engined Curtiss boat. As a result of his advice an order was given by the Admiralty in August 1914 for two experimental Curtiss flying boats. Tests of these were conducted by him at Felixstowe and in March 1915 an order was given for 50 of similar design but with engines of higher horse power. These engines proved unsatisfactory but by substituting Anzani engines they were at least useful for training and very limited patrol work. It was apparent that the hull was too weak to withstand take off or alighting on any but a calm sea and Commander Porte redesigned the whole hull into what became a new type - the Felixstowe flying boat. Another order was given at the end of 1915 for an additional 50 Curtiss flying boats of a larger size but the first one, delivered in July 1916, revealed the same underpowered engine and hull weakness. Again Commander Porte re-equipped with more powerful engines and redesigned the hull into a larger form of the Felixstowe type. These two classes were known as the Small and the Large Americas. Later on other refinements were incorporated and the types became the F.1 and F.2a.

(x) The Second U-boat Campaign

Resulting from the reorganisation of the Naval Air Service the use of airships for anti-U-boat work was rapidly expanded. The production of the S.S. Blimp type was in full spate early

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(1) These were known as C.M.Bs (Coastal Motor Boats) in the First World War and as M.T.Bs (Motor Torpedo Boats) in the Second World War.

The War in  
the Air  
Vol. II  
pp. 381-385

in 1916 and was followed soon after the Spring by the Coastal "C" type.(1) Kingsnorth, on the Medway, was the airship dock-yard and centre of invention and experiment. From here the airships were flown out to newly opened stations for the anti-U-boat patrol areas:-

See Map No. 1

Pembroke for the St. George's Channel area  
Mullion for the Channel Approach area  
Pulham for the East Anglia coast  
Howden for the Yorkshire coast  
East Fortune for the Forth area  
Longside for the Kinnaird Head area  
Kirkwall for co-operation with the Grand Fleet.

Owing to its limited offensive qualities at this time, the function of the airship was the detection of U-boats and the passing of these reports to the surface craft engaged on patrols in the different areas. To ensure an accurate datum point for such signals the airship made its call sign every hour to enable shore W/T stations to get regular crossbearing fixes.

The U-boat War flared up for a short time from mid-February 1916 following the replacement in the German High Command of Admiral Tirpitz by Admiral Scheer who was a strong advocate of ruthless submarine action. Shipping losses promptly rose at the end of February and during March to over 40 vessels. On 24 March the passenger vessel Sussex was sunk without warning with heavy loss of civilian life including a number of Americans. A note threatening to break off diplomatic relations led to another internal clash in Germany and once more orders were issued a month later that no passenger ships were to be sunk without warning, and although the sinkings rose further in April they fell away to an average of 20 of all sizes during the summer months.(2)

ibid  
p. 401

Vol. IV  
p. 1

After the Battle of Jutland and still more so after the unsuccessful sortie by the High Seas Fleet in August 1916, the German High Command realised that only the crushing of English economic life through U-boat action against her commerce held out any prospect of a victorious end to the war. In defiance of the political heads in Germany, the U-boat war was sharpened. Attacks with and without previous warning spread steadily westward through the English Channel to the open Atlantic. In effect the Second U-boat Campaign had started and shipping losses leapt from 18 in July to 77 in August and 82 in September. Seaplane patrols were redoubled along the Belgian coast against the Flanders U-boat and destroyer flotilla movements. More seaplane stations were opened at Bembridge and Portland to link up existing air patrols by Blimps working from Capel and Polegate in the eastern and from

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- (1) By the end of 1916 the programme of 50 S.S. type was completed, 27 Coastal "C" type had been delivered and an improved S.S. called the Zero type was in the course of construction.
  - (2) Although there was this fall in Home Water sinkings, the depredations by U-boats in the Mediterranean continued unabated. They had started as a serious factor in October 1915 and, with the exception of January and March 1916, accounted for a steady average of 24 vessels per month up to the end of July 1916.

Mullion in the western end of the Channel. But the intensification of patrols either by surface or air craft were no more than palliatives.

ibid  
p.3

In October the U-boat operations were stepped up and extended, northward as far as the White Sea and westward to the coast of America where U.53 sank five ships off Newport harbour. The month's losses reached the unprecedented total of 143 in Home Waters and Atlantic with a further 27 in the Mediterranean. The absence of any fresh plan of defence brought a strong letter from Sir John Jellicoe at Scapa Flow to the Admiralty urging far more energetic measures against the U-boats and warning "that losses in merchant shipping unless checked might by the summer of 1917 have such a serious effect upon the import of food and raw materials as to force on us the acceptance of peace terms which the Continental military position would not justify."

On 22 November 1916, Admiral Sir John Jellicoe was offered and accepted the post of First Sea Lord and Admiral Sir David Beatty took over command of the Grand Fleet. On 7 December Mr. Lloyd George replaced Mr. Asquith as Prime Minister and Mr. Balfour was succeeded as First Lord of the Admiralty by Sir Edward Carson. A fortnight later the Admiralty set up a special Anti-Submarine Division under Rear-Admiral A. L. Duff and shortly afterwards the Director of Air Services was made a member of the Board as a Fifth Sea Lord(1). As such he would now be able to speak with authority on naval air matters on the Air Board in like manner to the War Office representative who already was a member of the Army Council. These changes in the naval high command were destined to have considerable influence on the expansion of maritime air power, particularly in the increase of all types for employment in anti-U-boat measures and in the development of aircraft for co-operation with the Fleet.

ibid  
pp.46, 47

By the end of January 1917 the current U-boat campaign had grown into a very serious threat sinking as they had some 488 vessels of all sizes in Atlantic and Home Waters since the beginning of October. The most dangerous area lay in the English Channel and out into the S.W. Approaches. Our defence of the mass of converging shipping still consisted of area patrols by surface craft with limited co-operation in search by seaplanes and airships. As the danger area spread westwards more air patrols were required but the majority of naval air stations were on the East Coast. Proposals were made to establish new bases as rapidly as possible in Cornwall and along the South Irish Coast. Seaplane stations were accordingly opened at Plymouth and Newlyn, and "Large America" flying boats were based in the Scilly Islands. Opposition by the Vice-Admiral Queenstown to aircraft of any kind frustrated the institution of any air patrols off South Ireland so an air base was established at Fishguard to augment the airship patrols from Pembroke. Regarding the duties of aircraft, it was decided that seaplanes and flying boats supplemented by landplanes should carry out what were called the offensive searches and airships should merely report any U-boats sighted and give warnings to shipping in the vicinity.

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(1) Commodore G. M. Paine had just succeeded Rear-Admiral Vaughan-Lee as Director of Air Services and became 5th Sea Lord on 31 January 1917.

(xi) Unrestricted U-boat Warfare

The so-called Unrestricted U-boat Warfare started on 1 February 1917 but this declaration by the Germans was no more than a public notice of what had virtually been happening for some time.(1) Already the acceleration in supplying guns to our merchant ships had resulted in U-boat submerged attack with no warning by torpedoes in place of surfaced gunfire. Any significance in date lay in the fact that it was timed to coincide with a rapid rise in the numbers of U-boats sent out on operations. The operational strength of the U-boat Fleet had been rising throughout 1916 from only 40 in January to over 100 by the end of the year. On 1 February 1917 there were 49 boats based in North German ports, 33 in Flanders and 26 in the Mediterranean area. The maximum number of these were sent to sea during February and were kept at sea for as long as possible. In the Home Waters and Atlantic the loss among ships of greater tonnage than 500 G.R.T.(2) rose from about 100 during January to 106 in February and jumped to 136 in March, and 149 in April.(3) It was this rise in the number of U-boats operating at sea that caused the rapid increase in sinkings and not the "unrestricted" nature of U-boat warfare.

During the months of February, March and April there was a frantic effort to increase the air patrol coverage off our coasts in co-operation with yet more surface hunting craft. Landplane stations were opened at Prawle Point, Mullion and Pembroke, a series of fan patrols extended from headlands in southwest England and Wales, other patrols lined the offshore waters in the English Channel and the whole East Coast from the north of Scotland to the North Foreland was searched by the seaplanes, flying boats and airships of the various Commands. But these measures, widespread and intricate as they were, proved entirely inadequate.

(xii) The introduction of escorted convoys

By the end of April, in which 20% of all United Kingdom overseas trade was sunk, the supplies in this country had dropped to a critical level and the Fleet was almost immobilised through lack of coal and fuel. Only two lines of policy remained. Either an intensified concentration of sea/air forces into hunts for the U-boats or the adoption of escorted convoys. On these alternatives naval opinion was sharply divided. Mercifully the scales were tipped in favour of the latter by a belated realisation of the value that very limited convoy had proved in the latter half of 1916 for food ships coming from Holland and early in 1917 for the French cross-Channel coal trade. A similar limited convoy procedure was

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- (1) The political effect of this final flouting of American protests was the entry into the war on the side of the Allies of the United States on 6 April 1917.
  - (2) Detailed and classified statistics relating to ships sunk, area and conditions of loss were not compiled before February 1917 and thereafter only included merchant ships of 500 G.R.T. and above. See Appendix I.
  - (3) To these figures must be added those for the Mediterranean and the unknowns which together amounted to 32 in February, 28 in March and 77 in April. The gross loss to U-boats in April in all areas and of all sizes of vessels was 354 totalling 834,549 tons.

started at the end of April to Scandinavia and along parts of the East Coast. An experimental ocean convoy was sailed from Gibraltar on 10 May and before reaching the dangerous South-Western Approaches it received a destroyer escort followed by air escort by a flying boat from the Scillies. No attack on the convoy was attempted.

A special convoy organisation division was set up at the Admiralty and although a start was made in June it was not till July and August respectively that regular homeward and outward bound ocean convoys were sailing. During May, the Home Waters and Atlantic losses fell to 114 ships but this was because the endurance at sea of the initial U-boat strike was spent, the sinkings rose once more in June to 134 ships. Even now there were many who were dubious about the step being taken to go into convoy and many papers were written both for and against. Among those in favour, perhaps the most succinct came from the American Admiral W. S. Sims, commanding the American Naval Forces in European waters. As it covers the proper use of air as well as surface forces in what is still a vital part of maritime strategy an extract of his own words follows:-

A report from  
Admiral Sims to  
Washington  
dated  
29 June 1917

"There is certainly no sovereign solution for the submarine menace except through well-established methods of warfare based upon fundamental military principles. The cardinal principle of concentration of effort is at present being pursued by the enemy and not by the Allies. The enemy's submarine mission is and must continue to be the destruction of merchant shipping. Their object is to avoid contact with anti-submarine craft and this they can almost always do, as the submarine can see the surface craft at many times the distance the surface craft can see a periscope. Moreover the submarine greatly fears the anti-submarine craft because of the great danger of the depth charges. Our tactics must therefore be such as to force the submarine to incur this danger in order to get within range of merchantmen. It therefore seems to go without question that the only course for us to pursue is to revert to the ancient practice of convoy. This will be purely an offensive measure, because if we concentrate our shipping into convoys and protect it with our naval forces we will thereby force the enemy, in order to carry out its mission, to encounter naval forces which are a great danger to the submarine. At present our naval forces are wearing down their personnel and material in attempting to seek and engage an enemy whose object is to avoid such encounters. With the convoy system the conditions will be reversed. Our escorting forces can work on a deliberate pre-arranged plan while the enemy will be forced to disperse his forces and seek us. In a word, the handicap we now labour under will be shifted to the enemy; we will have adopted the essential principle of concentration while the enemy will lose it."

In July the shipping losses fell once more to 112 merchantmen and the next three month period August/October saw the benefit of convoy in unmistakable figures in contrast

to the heavy loss among ships still being sailed independently and such improvement continued up to the end of the year.

(xiii) Anti-U-boat operations become the major concern of naval aviation

(a) Patrol aircraft

The A/U flying effort was not classified in detail until 1 June 1917. During the first five months of the year the total flying hours by all kinds of aircraft engaged on this duty was about 12,500 and resulted in 39 sightings of which 25 were attacked. The detailed figures for aircraft and airships during subsequent months are given in Appendix II. What may have been the first shared air kill occurred on 24 April when a flying boat was sent out in answer to an S.O.S. from a ship being attacked south of Portland Bill. The U-boat was found on the surface and attacked with 2 - 100 lb. bombs after which she dived leaving oil on the surface. About an hour later a destroyer arrived and sighted the U-boat again surfaced but stopped in the same position. She dived and a depth charge attack was made after which more oil came to the surface. Postwar comparison with German records establish that UB.39 was in this area but never returned to harbour.

See Appendix III

While the adoption of a convoy system was being debated, it was decided to develop anti-U-boat operations from Felixstowe. Many U-boats on passage to their patrol areas from ports in Flanders passed on the surface near the North Hinder Light Vessel. A method of search was devised which was to become familiar as the Spider Web system. The Web was an octagonal area sixty miles in diameter with eight arms radiating from the centre thirty miles in length. Three sets of lines joined the arms at ten, twenty and thirty miles out from the centre. The eight sectors each sub-divided into three thus provided all kinds of combinations of patrol. U-boats, like the Zeppelins, were very free with the use of their wireless and when direction-finding indications were received from a U-boat, a reference to the chart on which the Spider Web was superimposed gave the sectors of the Web likely to result in a sighting. The scheme was started on 13 April 1917 and by the end of the month in 27 patrols there were eight sightings of U-boats of which three were bombed but no results were confirmed.(2)

See Map No.1

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(1)

Period	Total Ships Sunk	No. of Ships Convoyed	No. Sunk in Convoy	Convoy loss rate	Independent loss rate
May/July	360	8,707	27	0.31%	10%
Aug./Oct.	246	11,812	49	0.41%	8.58%

(2) By July the Spider Web System was in use from stations in the South West Approaches and later was instituted at points along our East Coast.

See Appendix III

The large flying boat could carry 4 - 230 lb. bombs which were supposed to be lethal to a U-boat of those times if a direct hit were secured and damaging in the case of a near miss. The first claimed success came on 20 May when 2 - 230 lb. bombs were dropped close ahead of a diving U-boat's conning tower in a position ten miles east of the North Hinder Light Vessel. German records reveal that UC.36 was in the vicinity on the day in question but never regained harbour. Definite successes came in July when on the 24th five flying boats sighted a surfaced U-boat and dropped 230 lb. bombs around the periscope as she dived near the same light vessel. Much oil and wreckage came to the surface marking the end of UC.1. On the 29th, UB.20 was found on the surface north of Zeebrugge by a Felixstowe flying boat whose attack with four bombs put her out of action. As she lay helpless on the surface a second flying boat completed her destruction. A further success occurred on 28 September when a flying boat, sent out on a Web patrol following a W/T interception, duly sighted a surfaced U-boat to the southward of the North Hinder. One 230 lb. bomb crippled her and a second direct hit sank her. She was later identified as UC.6.

In July a seaplane station was opened at Cherbourg to augment the anti-U-boat patrols in the Channel. The new station soon saw action. On the morning of 18 August a U-boat was reported northeast of Cherbourg, a seaplane was sent out, made two sightings followed by an attack with 100 lb. bombs which were claimed as direct hits. No confirmation has been possible but UB.32 was in the neighbourhood and did not return to harbour.

Patrols were also flown along the Flanders coast by Dunkirk seaplanes but they found ever increasing opposition from German aircraft and it became necessary to escort the seaplanes with fighter aircraft. From July large flying boats were used from Dunkirk. On 22 September the escorting fighter sighted a surfaced U-boat near the West Hinder Light Vessel. The flying-boat attacked with 230 lb. bombs and claimed to have sunk it. Once more, confirmation is not forthcoming but UC.72 never returned to harbour and might have been the victim. The enemy air opposition increased during the autumn months necessitating the expansion of escort fighters into a "Seaplane Defence Squadron". At the end of the year it was decided to use landplanes for the A/U patrols and the flying boats and seaplanes were returned to Felixstowe and Dover.

ibid  
Vol. IV  
pp.73, 74

See Appendix I

Patrol flying formed the bulk of anti-U-boat flying up to the end of the year and it is most significant that in the areas of heaviest loss, the east coast of England and the coastal waters around Cornwall and Devon, and where most of the shipping was still sailing independently, the air effort was being dissipated in area patrols to no effect.

(b) Convoy air escort

So far as the air service was concerned, the convoy system brought great advantages. It narrowed and defined the area of search and made it easier to systemise the employment of all anti-U-boat aircraft. These could now be organised to provide:-

- (i) Escorts for convoys
- (ii) Routine patrols
- (iii) Emergency patrols for hunting U-boats definitely reported.

The non-rigid airships proved invaluable for escorting convoys and for working with surface craft in protracted hunts of located U-boats. The flying boats were also used as escorts but their main employment was patrol over waters outside the range of sea and landplanes. Landplanes were found especially useful when immediate and speedy action was called for in positions close inshore.

U-boats treated escorting aircraft with great respect and down to the end of 1917 there was only one instance of a ship being lost from a convoy receiving air escort. This respect resulted in few opportunities for successful air attack but mainly because of airships' lack of speed of approach and the light armament carried. Unfortunately the statistics of the flying compiled from June 1917 onwards are not classified as to task and it is therefore not possible to give the sightings and attacks made by air escorts as opposed to air patrols.

What may have been the first kill by an escort aircraft took place on 28 June. A large flying boat from Felixstowe, when escorting a food convoy from Holland, sighted a surfaced U-boat ahead of the convoy to the westward of the North Hinder. A bombing attack was made on the U-boat as she dived which was followed by considerable oil and bubbles. UB.36 may have been destroyed as she never returned from patrol in this area.

Another form of air escort was that afforded by kite balloons. They had been developed during the latter part of 1916 for use in the Grand Fleet. After the introduction of the convoy system they were found of the greatest value in convoy escorts and in A/U surface patrol craft. Although there is evidence of only one U-boat (U.69) being destroyed as a result of kite balloon co-operation, they always acted as a serious deterrent to U-boat freedom of action. Enemy records confirm that U-boat captains found them most embarrassing and it is a fact that no convoy was ever molested when kite balloons were being flown by the escorts.

Their increasing use went far to compensate for the slender amount of aircraft escort. Even at the end of 1917 air escort was mainly confined to ocean convoys in the S.W. Approaches and other places where the routes were well offshore. Out of a total of 7,023 anti-U-boat sorties since 1 June, only 853 had been devoted to convoy escort.

(c) The growth of A/U forces

At the end of 1915 only 22 airships and about 120 heavier than air machines were available for A/U duties. This had grown by the end of 1916 to 47 airships and 160 heavier than air craft. The magnitude of the U-boat menace in 1917 had resulted by the end of the year in a leap up to 63 airships and 314 flying boats, seaplanes and landplanes. This represented 70 per cent of the R.N.A.S. strength at home. Air operations stretched round the whole of the United Kingdom except part of the west coast of Scotland. Air Ships were operating from Luce Bay, Larne, Anglesea, Pembroke, Mullion with its two sub-stations Laira and Bridport, Polegate, Capel, Howden, East Fortune and Longside. Seaplane and flying boat stations were at Fishguard, the Scillies, Newlyn, Cattewater (Plymouth), Torquay, Portland, Cherbourg, Calshot, Bembridge, Newhaven, Dover, Westgate, Felixstowe, Yarmouth, Killingholme, Hornsea, Seaton Carew, South Shields, Dundee and Strath Beg. Naval landplanes were stationed at Mullion, Padstow, Prawle Point,

Admty.  
A/S Monthly  
Reports

See Map No.1

Dover, Walmer, Yarmouth, Burgh Castle and Redcar. To these various stations must be added aircraft which operated under the direct control of the C.-in-C. Grand Fleet - seaplanes from Catfirth, Stenness, Scapa Flow, Houton and Rosyth, and landplanes from Turnhouse, Smoogroo and Donibristle.

(xiv) Aircraft armament against the U-boat

Much attention had and was being given to evolving an adequate weapon against the U-boat. Earlier in 1917, experience had shown that the smaller sizes of bombs (the 16 lb., 65 lb., and 100 lb.) were all insufficient to ensure destruction. This had led to the introduction of the 230 lb. bomb which could be fuzed for direct impact or delay action giving detonation at about 40 feet. The first attacks with this bomb took place in May 1917. Further calculations and trials led to the conclusion that a bomb effective up to 45 feet from the U-boat's hull was required to give a reasonable prospect of a successful attack. Experiments followed which established the effective distances from the hull of various amounts of explosive which were found to be:- 40 lbs. at 10 feet from the hull, 120 lbs. at 35 feet, and 300 lbs. at 70 feet. When related to the mean bombing error this meant that the heavier charge must be standardised and it was therefore strongly recommended that whenever possible the light case 520 lb. bomb carrying 300 lbs. of explosive should be carried.(1)

One other point of interest emerges from decisions taken in 1917 to make the air more deadly to the U-boat and relates to camouflage. In order to make airships and kite balloons more inconspicuous to U-boat look-outs an order was given to treat the fabric with a silver grey colour and paint the under parts white so as to relieve the dark silhouette shadow.(2)

It is often forgotten that the hydrophone, which was the universal means among surface craft for the detection of submerged U-boats, was adapted for use by aircraft. A non-directional type was used from seaplanes in the Mediterranean during July 1917 but its non-directional property discounted its value. At home further experiments were carried out at Westgate early in 1918 but in the rougher home waters the seaplane was not suitable. A bi-directional hydrophone hanging 10 feet underwater from a spar was later used by a number of large America flying boats but the advent of rough weather in the autumn of 1918 prevented any convincing operational results. Meanwhile a hydrophone had been mounted in a streamlined casing for towing by an airship. Various types were produced of which the most successful was the "Rubber Eel". This was in use during September 1918

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(1) Reference Admiralty A/S Division Report for December 1917. It is a melancholy thought that for the first year and a half of the Second World War the majority of A/U aircraft only carried a 100 lb. and a few 250 lb. bombs against a very much more robust U-boat.

Ref: The R.A.F. in Maritime War Vol.II pp.50, 51.

(2) When the white painting was first introduced in August 1941 to Coastal Command R.A.F. it was regarded as a new discovery.

Ref: The R.A.F. in Maritime War Vol.II App. XII.

from "C" type airships at Mullion. A supply to all Zero type airships was ordered but deliveries were not made before the cessation of hostilities.

(xv) Development in Carriers and Shipborne aircraft during 1917

Mention has been made that with Jellicoe at the Admiralty and Beatty in command of the Grand Fleet another phase of maritime air expansion was opened. We have seen the rise in importance of the air in anti-U-boat measures. Another form of expansion was put in train in February 1917 when Admiral Beatty stated his air requirements for the Grand Fleet which were:-

- (i) Reconnaissance over the North Sea
- (ii) Screening of the fleet by aircraft while on passage
- (iii) Landplanes for duty with the fleet
- (iv) Seaplane carriers
- (v) The use of seaplanes and kite balloons(1) as aids to gunnery.

He recommended that systematic reconnaissance of the North Sea should be done by large flying boats supplemented by non-rigid airships. The latter, of Coastal "C" or the new N.S. type, should provide a screen when the fleet left its bases by daylight. Landplanes were to be carried by the Campania and Manxman(2) for close fleet reconnaissance and for attacks on Zeppelins.

There was one other carrier available to the Grand Fleet - the Engadine - but she only carried four seaplanes and had no flight deck. These three carriers, who were too slow for consistent work with the fleet at sea, accommodated a total of only 12 reconnaissance and 12 fighter aircraft. Tentative plans for larger and faster carriers had been in existence since May 1916 but as such a vessel would take at least 18 months to construct it had been decided in August 1916 to acquire an unfinished Italian liner - the Conte Rosso - then lying at Messrs. Beardmore. She was renamed H.M.S. Argus and was entirely re-designed above the waterline but in February 1917 she was still far from completion. Ultimately she was launched in December 1917.

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- (1) Kite balloons first received attention for employment with the Grand Fleet in June 1915 but the early Drachen type proved unsuitable. It was not till mid-1916 that the French Caquet type was acquired and adapted for sea work. This type was supplied to some Grand Fleet units in the latter part of 1916 and their success led to a firm requirement for supply to many types of Grand Fleet ships. Their initial use was to spot for ship bombardments at the Dardanelles.
  - (2) The Manxman was formerly a passenger steamer on the Isle of Man service. She was taken over and commissioned in December 1916 to carry seaplanes aft and baby fighter seaplanes forward on a flight deck. It was now recommended that the latter should be replaced by small landplane fighters as giving a better chance of engaging Zeppelins.

ibid  
pp.10-13

To meet Admiral Beatty's pressing need and after much discussion it was decided to modify H.M.S. Furious(1) into an aircraft carrier capable of flying off up to ten aircraft. She came into service as a carrier in July 1917 and shortly afterwards while under way, Squadron Commander E. H. Dunning succeeded in landing an aircraft back on the flight deck, thus becoming the first man to alight on a moving ship. This opened up such possibilities that it was decided to pay her off again for further reconstruction incorporating a landing-on deck aft. This alteration was not complete until March 1918.

ibid  
p.14

Independently of Admiral Beatty's request, the Admiralty with Government approval in February 1917 took over two merchant ships then building, for conversion into short range North Sea carriers. These were the Stockholme, renamed H.M.S. Pegasus, and the Nairana, whose name was unchanged. They were completed in August and September 1917 to carry nine and eight aircraft respectively. Designs for two ocean-going carriers were prepared in April 1917 but only one was proceeded with.(2) In August 1917 the Admiralty reviewed the carrier position and decided to modify the light cruiser Cavendish, then building at Belfast, to carry six landplanes with a flying-off deck forward and a landing deck aft. She was renamed H.M.S. Vindictive but did not commission until October 1918.

Between April and July 1917 the Manxman with Grand Fleet escort and the Vindex with the Harwich light cruiser force operated with numerous minelaying expeditions to the German coasts but no opportunities were found to engage enemy air patrols. The flying boats had better luck. In April it was decided that the "Large Americas" stationed at Felixstowe, Yarmouth and Killingholme should, in addition to their duties of reconnaissance and anti-U-boat patrols, be used to intercept patrolling Zeppelins. When wireless intelligence indicated the presence of these airships, the flying boats were to be sent out and subsequent direction finding fixes relayed to them by W/T. The scheme was put into operation from 26 April and resulted on 14 May in the naval Zeppelin L.22 being destroyed near the Terschelling Light Vessel by a flying boat from Yarmouth. After an indecisive action with another Zeppelin on 5 June in the same area, a second success came on 14 June when a Felixstowe flying boat destroyed the L.43 off the island of Vlieland. Three more interceptions were made during July but in each case the enemy airship escaped by rapidly climbing out of range.

Another kind of experiment was to have far reaching results. At Rosyth an extemporised platform was mounted just forward of the bridge of the light cruiser Yarmouth to carry a small landplane fighter which was successfully flown off in trials during June 1917. On 21 August, the Yarmouth with her fighter was in company with other ships covering a minelaying operation off the Danish coast.

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- (1) The Furious, Glorious and Courageous were large, fast, heavily gunned light cruisers then nearing completion.  
(2) This was H.M.S. Hermes, the first ship specifically designed as an aircraft carrier but she was not launched before the end of the war.

A reconnoitering Zeppelin was sighted, the fighter was flown off and destroyed L.23 soon after. Similar flying-off platforms were immediately fitted in other light cruisers and it was agreed to fit them in the future to the Courageous and Glorious.

The whole question of shipborne, as opposed to carrierborne, aircraft was simplified and extended by successful trials during October 1917 in which an aircraft was flown off from a specially fitted structure on top of one of the gun turrets in the battle-cruiser Repulse. By training the turret the aircraft could fly off into the "felt" wind without the necessity for the parent ship to leave the battle formation. By early 1918 these turret platforms had been fitted in all battle cruisers and in the Glorious and Courageous while for light cruisers a rotatable platform was designed and fitted either on the forecastle or just abaft the funnels.

The requirement for systematic and long endurance reconnaissance over the North Sea was more difficult to satisfy. The existing Coastal "C" type of airship had insufficient endurance and it was hoped that the new North Sea or N.S. type with a patrol duration of 20 hours would meet the case. The first one - N.S.1 - became operational at Pulham in April 1917 and by July the N.S.1 and N.S.3 were occasionally used from East Fortune for fleet reconnaissance with the battlecruiser squadron but the type was still of too limited a range and too subject to weather conditions. Air reconnaissance with the Grand Fleet was found to be better performed by kite balloons which by the end of 1917 were or could be carried in all classes of major warships. Towards the end of the year three rigid airships (R.23, R.24 and R.25) carried out their acceptance flights but were not operational until 1918.(1)

In view of the rapid increase in provision of naval aircraft specifically earmarked for duties with the fleet and also because the imminent creation of an autonomous Air Service was likely to complicate the administration of the Fleet air component, the C.-in-C. Grand Fleet requested that a Flag Officer be appointed to command the Grand Fleet carriers and be in charge of all aircraft working with the fleet. The Admiralty concurred and on 3 January 1918 Rear-Admiral R. F. Phillimore was created Admiral Commanding Aircraft. Under his orders were placed the carriers, the shore depots, and the air stations at Donibristle, Rosyth, Smoogroo, Scapa Flow, and Turnhouse.

(xvi) The Dunkirk Force in 1917

Photographic reconnaissance on 1 February 1917 disclosed German shipping of all kinds completely icebound in Bruges harbour. Among the vessels immobilised were 19 destroyers and three U-boats. During the next ten days attacks were launched by Nos. 4 and 5 Wings but no destroyers or U-boats were hit. A long spell of bad flying weather prevented any further bombing until early April. Night attacks were then

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(1) The first rigid airship to be built was "No. 9" and became operational in April 1917 but was found unsatisfactory due to her low ceiling. Subsequently she was used only for training purposes.

made by seaplanes on Zeebrugge and the occasion was marked by the first use of the 520 lb. bomb.

ibid  
Vol. IV  
pp.78-81

During April the Dunkirk air units were reorganised following the despatch of four naval fighter squadrons to reinforce the R.F.C. Not only did this transfer cut seriously into the strength of Dunkirk pilots but the backing of these squadrons during their service with the R.F.C. was a further drain.

No. 1 Wing at St. Pol was made responsible for all naval co-operation and took over the administration of the seaplanes at Dunkirk and Dover.

No. 4 Wing was moved forward to La Panne and provided offensive patrols and fighter escorts including the protection of bombardment ships from enemy air attack.

No. 5 Wing was charged with the duty of day and night bombing.

ibid  
p. 82

The first Handley Page bombing squadron joined No. 5 Wing in April and on the 23rd had their first daylight action escorted by fighters against five German destroyers sighted off Ostend. One destroyer was sunk and one damaged. A similar action three days later was unsuccessful and enemy fighters shot down one bomber. Efforts to rescue the crew resulted in further loss including a French flying boat and Handley Page operations were thereafter restricted to night bombing.

ibid  
p. 101

During May and June all the Dunkirk aircraft were used for support and spotting duties in a series of naval bombardments of Zeebrugge and Ostend. In June another naval squadron was transferred to the R.F.C. and from July the Dunkirk Force was increasingly engaged in operations to help the Army during the Ypres Offensive. To induce the enemy to withdraw fighter squadrons from the Army front, escorted daylight bombing of enemy airfields, and day and night bombing of enemy rail communications and bases in Belgium was carried out during July, August and September. An additional task was the flying of interception patrols against the Belgian based Gothas engaged in raiding England and specific bombing attacks were made on their airfields near Ghent. The enemy retaliated in no uncertain manner and in the course of sustained enemy bombing attacks at the end of September immense damage was done to the aircraft base and depot at St. Pol which temporarily crippled the Dunkirk Wings. In October the Handley Pages carried out several night attacks on Zeebrugge besides other targets in Belgium. Nine of these aircraft attempted on 28 October to bomb marshalling yards and barracks in Cologne as part of the retaliatory policy on German cities adopted by the War Cabinet. Bad weather frustrated this attempt and the bombs were dropped on alternative targets in Belgium. Poor weather continued to limit operations through the winter up to the end of February 1918 but sporadic attacks on enemy bases in Flanders were flown whenever possible.

ibid  
pp.105-107

It is of interest to note that this bombing of naval bases in Belgium, which was never continuous or particularly damaging, forced the Germans to construct ever-increasing ferro-concrete covered protection over sheds, docks, workshops and ammunition storages. In particular, at Bruges a large section of the dookyard basin was roofed over with concrete

two metres thick and divided into bays in which U-boats lay secure from all bombing attacks. In the Second World War, the mere threat of bombing attack resulted in similar but vastly more extensive construction at the Biscay port U-boat bases.(1)

The Dunkirk Force was called upon to do too much by too many people. There was the purely naval work required by the Vice-Admiral Dover, demands in connexion with military operations, action required against Zeppelin and Gothas in transit to and from raids on England, and the continuous calls for the bombing of U-boat and other naval bases in Belgium. The result was a diversity of objectives and the dissipation of an effort lessened by the steady drain of pilots and aircraft to help the R.F.C.

(xvii) Air work with the Fleet in 1918

Following the solution in the latter part of 1917 of the carriage of fighters in all classes of light and battle cruisers, an Admiralty Committee made the following decisions on 16 January 1918:-

1. It was approved that fighters should be carried in all types of fighting ships and that reconnaissance and torpedo planes(2) should only be carried in special carriers.
2. That the Pegasus and Nairana should be altered to carry fighters.
3. That the Campania be retained for training purposes and the fitting of a flying-on deck be postponed until further experience had been gained with the Argus and Cavendish (later to become the Vindictive).
4. It was approved to convert the ex-Chilean battleship Almirante Cochrane, then building at Elswick, into an aircraft carrier.(3)

In March 1918 the Furious rejoined the Grand Fleet after being fitted with a flying-on deck aft and became the flagship of the Admiral Commanding Aircraft. However, it was soon found quite impracticable to fly on except at anchor or at very slow steaming speed owing to the air turbulence set up by the centre

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(1) See the R.A.F. in Maritime War Volume III pp. 24n, 347, 350.

(2) The torpedo had long been one of the chief weapons of naval warfare and its carriage in either seaplane or landplane was actively pursued as early as 1913. Although some success had attended the use of torpedo carrying seaplanes at Gallipoli, the project faded away and it was not till 1916 that a torpedo landplane called the Cuckoo was designed by Messrs. Sopwith. It was produced the following year by Messrs. Blackburn and a large production programme approved in November 1917. Deliveries did not start till June 1918 and by mid-August there were 26 completed. The first operational squadron was embarked in the Argus in October 1918.

Ref: The War in the Air Volume I, pp.466-469.

(3) The ship was renamed H.M.S. Eagle and launched in June 1918.

superstructure and funnel. Landing-on was abandoned and pending some solution the Furious carried on operating with only flying-off facilities. Schemes were investigated for either placing the superstructure to one side of the deck or right in the stern of the ship. Both ideas were incorporated in the redesigning of the aircraft carriers then under construction. In the case of the Argus the whole superstructure was removed and the funnel abolished by fitting smoke ducts at the stern so providing an absolutely clear flying deck. These alterations put her acceptance trials back until September 1918 and she was not operational before the Armistice. In the case of the Eagle (ex-Chilean battleship) the other scheme was put into effect. The funnel and bridge superstructure was placed over to one side of the flying deck in the form of a streamlined island. She too did not become operational before the end of the war.

During the spring an innovation was instituted to increase the range of aircraft by towing them to the scene of action on skid lighters astern of destroyers. In the case of flying boats this was not very successful so they continued to be used normally against Zeppelin patrols and on 10 May a Killingholme flying boat destroyed L.62 about 60 miles west of Heligoland. However, there was increasing opposition to all forms of reconnaissance flights by enemy seaplanes and many combats resulted. The carrier Furious escorted by light cruisers did much routine scouting off the coast of Denmark and in July carried out an operation against the naval Zeppelin sheds at Tondern in Schleswig. On the 19th her aircraft attacked and destroyed L.54 and L.60 as they lay in their sheds. Another Zeppelin - L.53 was destroyed on 10 August in the Heligoland Bight by a landplane fighter which took off from a skid lighter in tow from a destroyer with the Harwich Strike Force.

During the late summer of 1918 the question was raised as to the administration of the R.A.F. units co-operating with the Fleet. At a meeting held at Scapa Flow on 29 August it was agreed that these units should form a Grand Fleet Group, to be known as No. 29 Group, for administration and disciplinary purposes under the command of a Brigadier-General R.A.F. This was approved by the Admiralty and Air Ministry. No. 29 Group consisted of all R.A.F. units embarked in ships of the Grand Fleet and the units and stations provided ashore for co-operation with the Fleet. The control of Fleet Air Operations remained in the hands of the Admiral Commanding Aircraft.

(xviii) The R.A.F. take over the Dunkirk Force in April 1918

One of the first measures taken by the new Air Council after its creation on 3 January 1918 was a proposal to the Admiralty that the air forces in the Dunkirk/Dover area should be reorganised and this was agreed to as under:-

1. A Wing to be attached permanently to the Dunkirk Command for naval operations under the direct command of the Vice-Admiral Dover. Maintenance would be arranged by the R.F.C.
2. For local operations, any assistance needed should be requested from the R.F.C. Commander in the Dunkirk area.

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3. For larger operations the Vice-Admiral Dover should apply to the Field Marshal Commanding in France.
4. For major operations necessitating a considerable concentration of air forces it was presumed the Admiralty would communicate with the Army Council and the Air Council.
5. The strength of the above Wing to be one squadron for reconnaissance, one squadron for anti-U-boat work, and three squadrons of fighters.

By March 1918 the arrangements for amalgamating the two Air Services were nearing completion and the ex-naval squadrons had the figure 200 added to their previous distinguishing number with the figure 60 added to the Wing number in the new Royal Air Force system. Thus it was the 61st Wing that was permanently attached to the Dunkirk Command while the 64th and 65th Wings were grouped as the VII Brigade of the R.A.F. and placed under the orders of the Field Marshal Commanding in France.(1) It was never intended that the VII Brigade squadrons should be moved from the coastal area as the objective was to operate them under the orders of the Air Council in a large scale of bombing attacks on German naval targets on or near the Belgian coast. It was further intended to build this Brigade into a northern bombing force as a counterpart to the proposed southern bombing force to be based near Nancy. This latter, to be known as the Independent Bombing Force, duly came into being but the former never materialised, partly because of the failure in aircraft production but mostly because in the stress of the German 1918 Offensive all the squadrons which could possibly be spared were moved, with Admiralty agreement, to the vital battle fronts.(2)

The remaining squadrons, which by May 1918 numbered six,(3) together with air units at Dover were formed into No. 5 Group R.A.F. under the command of Brigadier-General C. L. Lambe. The predominant feature of the Dunkirk air effort during April and May was the co-operation with the Navy in the famous block-ship actions at Zeebrugge and Ostend. This consisted of continual air photography, reconnaissance of the Belgian coast and ports, and anti-U-boat patrols before these operations and the bombing of enemy batteries during the attacks.

During June and July, No. 5 Group was re-inforced by four squadrons of the new 82nd Wing. Bombing attacks were made against enemy docks, rail centres and airfields, and at the end of September on enemy ground troops and communications during the opening stages of the Flanders Offensive. These bombing operations were merged during October in the final Army drive through Belgium.

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- (1) The 61st Wing consisted of Nos. 201, 202, 210, 213 and 217 Sqdns.  
The 64th Wing consisted of Nos. 203, 204, 208 and 209 Sqdns.  
The 65th Wing consisted of Nos. 205, 206, 207, 211 and 214 Sqdns.
  - (2) The squadrons so transferred were Nos. 201 and 210 from the 61st Wing and Nos. 203, 205, 206, 208 and 209 from the VII Brigade which was then disbanded.
  - (3) The six squadrons were Nos. 202, 204, 211, 213, 214 and 217.

(xix) The Independent Bombing Force

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It will be remembered that the first organised independent and relatively long ranged bombing into Germany was done by the naval No. 3 Wing based at Luxeuil in the Nancy area. The operations from October 1916 until its disbandment in May 1917 have been given in Section (viii). Such attacks on Germany were restarted as a direct consequence of the night raids on London by Gotha landplanes in September 1917. In his famous report of 17 August, Lieut. General Smuts had said that the recently approved air expansion programme would produce a surplus of aeroplanes which should be employed in independent bombing operations. The public outcry after the September night raids by Gothas had specified retaliation on German cities. Accordingly the War Cabinet requested Smuts to make proposals for carrying the air war into Germany at the earliest moment. On examination of the means, Smuts was dismayed to find how backward was the delivery of aircraft. Not only was there little likelihood of the recent doubling of the R.F.C. being fulfilled in the foreseeable future but the previous programme, approved in December 1916, was well behind schedule.(1) The War Cabinet had been led to believe that early in 1918 there would be a substantial surplus and it was partly to direct this surplus that a separate Air Ministry and Staff had been agreed to. Now they were informed that the much smaller earlier programme, sanctioned exclusively for the R.F.C. with the Army, was not being fulfilled.

As an immediate measure the War Cabinet, after hearing advice from Smuts and General Trenchard, approved the formation of a special unit entitled the 41st Wing to carry out independent bombing operations from a base airfield at Ochey near Nancy. This Wing consisted of No. 55 R.F.C. Squadron for day bombing and Nos. 100 R.F.C. and 16 R.N.A.S. Squadrons for night bombing,(2) under the command of Lieut.-Colonel C. L. N. Newall. The objectives were much the same as for the earlier Luxeuil force, namely the coal and iron fields of Lorraine and the Saar, the chemical works at Mannheim and miscellaneous war industries in Cologne, Stuttgart, Mainz and Coblenz. The bombing campaign opened on 17 October 1917 and was carried on through the winter under very poor weather conditions. On 1 February 1918 under the new R.A.F. nomenclature the Wing became the VIII Brigade R.A.F. but the strength remained the same until May when Nos. 99 and 104 Squadrons joined up. Between 17 October 1917 and 5 June 1918 the force made 142 raids.

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- (1) This December 1916 programme was to complete by September 1917 a total R.F.C. establishment of 106 squadrons of which 76 were for the Western Front. This latter did not include ten long range bombing squadrons which had already been sanctioned in June 1916 after request by Major-General Trenchard. The actual strength of the R.F.C. in France in November 1917 was only 53 squadrons including two transferred from the R.N.A.S. The recent July 1917 programme was for a total R.F.C. establishment of 200 squadrons including 50 long range bombing squadrons and for the doubling of the R.N.A.S.
- (2) No. 16 Naval Sqdn. were Handley Pages who were withdrawn from the Yorkshire coast where they had been employed on anti-U-boat duties.

ibid  
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In May the War Cabinet decided to create a larger Independent Bombing Force for an extended and sustained offensive against German munition centres. The command was given to Major-General Sir Hugh Trenchard who took up his appointment on 6 June 1918. The objectives were attacks on as many of the large industrial centres as it was possible to reach so as to create the most widespread morale effect and to cripple retaliatory enemy air operations by bombing their airfields. Such operations started on 8 June with the same five squadrons organised in two Wings(1) which were intended to expand to a strength of 60 squadrons. The force was augmented during August by four more bombing squadrons (Nos. 97, 110, 115 and 215) and one fighter squadron in September (No. 45) and that was all.

Up to the end of the war some 360 air raids were carried out in which 160 tons of bombs were dropped by day and 390 tons by night and of this amount 220 tons were released on enemy airfields. As a result, attacks on Allied airfields became negligible and not a single aeroplane was destroyed by enemy bombing during the period 5 June to 11 November 1918. The confirmed effects from German records include:-

- (i) A definite weakening of the German national will, particularly during the late summer of 1918.
- (ii) A falling off in the production of essential war materials chiefly through loss of time as a result of the numerous air raid alarms but partly because of the lowered morale of the workers.
- (iii) A large diversion of enemy fighter squadrons, A/A guns, searchlights, and material and labour to both active and passive schemes of defence.

ibid

This was effected by a little force never numbering more than nine squadrons - far below the ambitious proclamation in August 1917. From 40 new long range bombing squadrons sanctioned in July 1917, the succession of programmes rose to a peak of 104 squadrons sanctioned in August 1918. The war ended with only nine squadrons which was still one short of the number Major-General Trenchard had asked for in June 1916 - a year before an independent bombing force had been thought of.

(xx) The R.A.F. in the U-boat War during 1918

By early 1918 the U-boat tactics had changed. They found by experience that their operations had small chance of success unless conducted close inshore where a mass of independent merchant shipping could still be found on their way to a port of assembly for convoy or after they had dispersed from ocean convoy. In the latter weeks of 1917 the number of ships sunk within ten miles of the coast rose steadily. Moreover an ever increasing number of attacks were taking place at night which caught the defence at the weakest place.(2)

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pp. 329-332 and  
Admty. Hist. Section  
records.

- (1) 41st Wing - Day bombing - Nos. 55, 99 and 104 Sqdns.  
83rd Wing - Night bombing - Nos. 100 and 216 Sqdns.  
(2) Percentage of U-boat attacks that were made at night:-

Feb./Apr. 1917	May/July 1917	Aug./Oct. 1917	Nov./Jan. 1917/1918	Feb./April 1918	May/July 1918	Aug./Oct. 1918
21.4	17.8	28.5	54.2	41.9	31.5	37.5

See Appendix I

During January 1918 the losses within this belt reached sixty per cent of the total sinkings. The landplane, now took on a new importance for A/U work as it could operate from any suitable airfield near the coast but the measures taken against this inshore U-boat campaign were of a makeshift kind until nearly the end of March. Then a considered scheme was put forward by Captain R. M. Groves, R.N., the deputy-controller of the technical department of the Air Ministry. This consisted of so-called protective lanes for merchant ships within ten or fifteen miles of the coast to be patrolled by aircraft at a density of one every 20 minutes which, it was held, would frighten the U-boats away. A large number of semi-obsolete landplanes were disposed in twenty seven flights of six aircraft each around the coast from St. Abb's Head to the Humber, along the English Channel coast, and in the Irish Sea to augment the existing area patrol systems.

By this time the Air Ministry, who since January had been gathering the reins, took over the administration of all the maritime air forces(1). The continuity of day to day operations continued through the same individuals at group and squadron level but from the official date 1 April 1918 they were now Royal Air Force and assumed Air Force rank and uniforms.(2) To the end of the war, however, maritime air policy and dispositions were virtually directed by the Admiralty and the control of actual operations continued to be exercised by the naval area commanders. Early in April the Admiralty forwarded to the Air Ministry their policy for the employment of aircraft engaged in the anti-U-boat campaign. Briefly this was:-

In Coastal Areas - An operational air group for each strategic area, the headquarters of which to be in immediate touch with the naval area commander and with the local base intelligence officer, and linked by telephone with all air stations and W/T stations in the Group.

Duties

- (a) Kite balloons for suitable surface craft when available, for escort to convoys and to work with surface hunting flotillas.
- (b) Landplanes to maintain intensive patrol of an inshore zone 15 to 20 miles from the coast.
- (c) Seaplanes and flying boats to work further to seaward on sweeps, escorting, and in co-operation with hunting craft.
- (d) Airships would be employed principally for escorting and searching ahead of convoys but also to co-operate with hunting flotillas, in diverting traffic, and in searching for mines.

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(1) Excepting airships which remained under the Admiralty.  
(2) R.A.F. rank was military in character similar to the R.F.C. The ex-R.N.A.S. were allowed to continue in naval uniform until discarded for fair wear and tear. The renumbering of ex-R.N.A.S. Wings and Squadrons has already been alluded to.

SECRET

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- (e) All personnel to be specially trained in submarine hunting.(1)
- (f) Each air station to be in W/T touch with its patrol aircraft.
- (g) A system of D/F stations to be established.

In mine barrage areas - Aircraft to patrol each mine barrage area so as to compel U-boats to dive into deep minefields.

Attacks on enemy naval bases - Bases in Belgium to be attacked as nearly continuously as possible. Bases in Germany as opportunity offered and as the range of aircraft developed.

There followed a list of aircraft types most needed and the numbers required to be available by the end of 1918:-

For anti-U-boat and bombing duties

A landplane to carry 1-520 lb. or 2-230 lb. bombs.	- 13 sqdns. (648 A/C)
A light fighter bomber for the Yarmouth, Boulogne and Ostend areas	- 13 flights (78 A/C)
A large flying boat to carry 2-520 lb. bombs	- 165 required
A small flying boat or float type seaplane	to carry 1-520 lb. or 2-230 lb. bombs - 180 required
Airships - S.S. Twin type	- 115 required

For the Grand Fleet

Eight seaplanes and 194 landplanes of various types.

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This policy and the recommendations were accepted by the Air Ministry and four Groups were established in the strategic areas - No. 5 Group for the Dunkirk/Dover area, No. 10 for the Portsmouth area, No. 9 for the Plymouth area and No. 18 for the East Coast. In the event the requirement programme outlined above proved quite impossible to implement and as far as numbers went only a little more than half was available

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- (1) A school for A/U observers was opened at Aldeburgh. Books and pamphlets dealing with U-boat tactics were issued to all stations and they were visited by expert lecturers.

in November 1918. The various expansion programmes and actual strengths are given below in footnote(1).

During April, May and June the major work of Nos. 9, 10 and 18 Groups was the maintenance of the inshore patrols in co-operation with the surface hunting flotillas. The amount of flying increased but with little result on the U-boat operations. The scheme of protective lanes for the independently sailing traffic was a failure. April sinkings continued to be heavy and although in May the Dover mine barrage was at last made effective in stopping the passage of U-boats through the Strait, there was no abatement in U-boat success off the East Coast or in the Bristol Channel, neither did they suffer any losses from the hunting patrols.

A start was made at last in June to put coastwise traffic into convoy and by the end of July nearly all East Coast shipping had been so organised. A proportion of the airship, flying boat, seaplane and landplane patrols was utilised to provide air escort and cover. Ship sinkings steadily decreased throughout the summer and autumn and were accompanied by rising losses among the U-boats in which the air escorts played a part. On 30 May 1918 UC.49 was shared sunk off Sunderland between a landplane on convoy escort and the subsequent air/sea hunt. UC.70 was shared sunk on 28 August off Whitby between a landplane on convoy cover and the destroyer Ouse; it is of interest that the aircraft used a 520 lb. bomb. The last success was the destruction of UB.115 on 29 September off Newbiggin Point shared between the rigid airship R.29 and H.M. ships engaged in escort to a convoy. Sinkings continued high in the Bristol Channel area until the end of September when at last coastal convoys were instituted along the North Cornwall and Devon stretch. Here again the patrol aircraft were used more profitably as escorts and cover to the convoys.

Even with the experience gained in 1917, there were in 1918 far more air sorties on area patrols than on escort to convoys but the proportion devoted to convoys rose from one in eight to one in five sorties and only three ships were sunk from convoys receiving air escort.

The War in  
the Air  
Vol. VI  
pp.345-348  
See Appendix III

(1) Description	Flying boats and Seaplanes	Landplanes	Total
Programme approved in August 1917 for completion by June 1918	961	467	1,428
Revised in November 1917	647	533	1,180
Actually on operating stations on 1 January 1918	309	119	428
Programme requested in April 1918 for completion by December 1918	353	920	1,273
Actually on operating stations on 9 November 1918	305	382	687

(xxi) Summary and Conclusions

This brief survey of the 1914-1918 War in Home Waters shows the growth of maritime air power from very small beginnings to a position of great importance. The development was effected by the Admiralty and the Royal Naval Air Service but by the amalgamation of the air services in 1918 the burden of continuity was placed on the Royal Air Force and it is from this date that the story of the R.A.F. in Maritime War really starts. Although the immense expansion in the maritime air forces planned to be attained by the end of the war did not materialise, the strength of the purely maritime side of the R.A.F. in Home Waters on 11 November 1918 was 43 squadrons and seven flights numbering about 685 planes and 103 airships. No less than 37 of these squadrons (285 flying boats and seaplanes, and 272 landplanes) were engaged on anti-U-boat duties together with all the airships.

See Appendix IV  
and V

Anti-U-boat

It can therefore be seen that the outstanding task was anti-U-boat and under this heading it was agreed that the provision of air escort and cover to convoys, both ocean and inshore, was a most essential task. By the end of the war much confused reasoning had been clarified and experience had shown that the convoy system, with adequate surface and air escort, far from being defensive was highly offensive in character for not only did it prevent ships from being sunk but the escorts destroyed more U-boats than any other method of direct attack. Area patrol unrelated to convoy movements was useless.

The conclusion of the Naval Staff in 1918 on the correct usage of air escort was that "a single escorting machine should keep close to the convoy as, for fear of being betrayed by the track of their torpedoes, the U-boat commanders refrain from attack on convoys with aerial escort. The ideal was that a convoy should be escorted by at least two aircraft, one keeping close and one cruising wide to prevent a submarine on the surface from getting into a position to attack. The rear of the convoy should not be omitted, for a submarine may be following on the chance of getting in an attack after dark."(1)

Although aircraft sank few U-boats(2), the development of a suitable weapon of attack had shown that nothing less than the 520 lb. bomb was really effective. Regarding the prevalence of night attack by surfaced U-boats it is of interest that the mounting of searchlights in aircraft was advocated. (3) Experience had also shown the necessity for the exchange of views between the crews of aircraft and ships which resulted in "increased efficiency in operations, because each branch has understood something of the conditions under which the other worked."(4)

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- (1) This was forgotten and not restated as policy until October 1940.  
Ref: The R.A.F. in Maritime War Vol. II, p.272.
  - (2) A list of U-boats probably sunk or shared sunk by aircraft is given at Appendix III.
  - (3) It was not until June 1942 that this was put into operation.  
Ref: The R.A.F. in Maritime War Vol. III, p.84.
  - (4) This was forgotten and not restated as policy until May 1941.  
Ref: The R.A.F. in Maritime War Vol. II, p.307.

The last seven months of the maritime air war operations were under R.A.F. participation and the experiences with their lessons should have been indoctrinated against a future emergency by the Air Staff no less than by the Admiralty.

Fleet reconnaissance and support

Although only six squadrons and seven flights of aircraft were attached to the Grand Fleet in the closing months of the war, the importance of air reconnaissance and support to naval operations by either the Grand Fleet or detached naval forces was of greater importance than this small allocation would imply. The tardy production of seagoing carriers had stimulated the successful carriage of both scouting and fighter types in the major warships themselves but, as these were essentially "one shot aircraft" and could not be recovered after flying off, it was realised that the satisfaction of the air requirement lay in the large fast carriers either just in commission or completing at the end of the war.

Bombing

Finally, the bombing of enemy occupied or homeland German targets was recognised as a maritime air task in so far as they contained naval objectives, under which broad heading came numerous war industries as well as naval bases. The R.N.A.S. had taken the first initiative in this direction and it was only due to extraneous reasons that this form of attack was not exploited more fully. It was, however, realised that such bombing to be effective must be fairly continuous by day and night, and even if effective the results would be long term and not immediate.

Maritime Air Power

In all the foregoing maritime tasks it was, at one time or another, found necessary to provide fighter protection either as escort or to prevent enemy air retaliation so that the definition of maritime air power had come to include not only the basic sea reconnaissance and action against enemy forces at sea but the equally important components of fighter and bomber. It was the failure at Political as well as at Service levels to remember and profit by war experience during the peace years that followed which led to the disregard of many of these requirements and which goes far to explain how unprepared was the maritime part of the R.A.F. in 1939.

CHAPTER III

THE POSTWAR EMERGENCE OF THE PERMANENT AIR FORCE  
(November 1918 to April 1921)

(i) Demobilisation and the first Scheme for a postwar Air Force

See Location of  
units in  
App. V.

At the Armistice on 11 November 1918 the strength of the Royal Air Force in all theatres amounted to 193 full squadrons and 15 flights of operational aircraft with 187 training squadrons, aggregating to a total establishment of 22,647 aircraft of all types manned by 27,333 officers and 263,837 other ranks. These were based at 286 home stations and 274 abroad, excluding home defence landing grounds and emergency airfields abroad totalling 115 in all.

War Cabinet  
Paper G.T.6478

On 12 December 1918, the Secretary of State for the Air Force (Lord Weir) submitted a paper to the War Cabinet on the Postwar Air Force. It was a long and comprehensive document which not only dealt with the military side but stressed the importance of planning for civil flying and its influence on the development of all types of aviation. The salient features were the proposals as to the postwar functions of the R.A.F. and Air Ministry which were as follows:-

Military Section

A.H.B.  
ID2/100 -  
Encl. 3 Nos. 1  
and 2

1. To form an Imperial Air Staff on the lines of the Imperial General Staff in the War Office.
2. To provide specialised units to co-operate with land forces.
3. To provide specialised units to co-operate with sea forces.
4. To provide an Air Fleet comprising a striking force and a home defence force.
5. To provide a general reserve, to be drawn from commercial air services where possible.
6. To provide a cadre of lighter-than-air services for coastguard duties.
7. To assume responsibility for all anti-aircraft measures.
8. To undertake the training of all pilots.
9. To provide such aerial services as may be required by other Government Departments, e.g. Police or Surveys.

Civil Section

1. To be constituted as the authority on all questions of civilian air transport.
2. To undertake mail, goods, and passenger services.
3. To carry out functions of inspections and certification of aircraft under domestic legislation shortly to be introduced.

4. To own and maintain all aerodromes.
5. To initiate such steps as may be necessary to secure rights in international air routes.
6. To inaugurate a Meteorological Department.
7. To undertake technical research for the development of aviation.

ibid

Then followed a summary of the proposed strength, character, and disposition of the Postwar R.A.F. which amounted to a total of some 60 full strength squadrons with a further 90 reduced to cadre. The estimate envisaged the deployment of the majority of the full strength squadrons to Overseas Areas leaving only a small force in the United Kingdom for general purposes and co-operation with the Grand Fleet. Finally there were more detailed proposals governing civil aviation, the taking over from the Ministry of Munitions of the functions of Supply and Technical design, and the purchase of whatever aerodromes were required for the peacetime establishment of the R.A.F. The Paper made it clear that the strength figures were not intended to be more than approximate because as yet the Cabinet had made no decision how far demobilisation was to go.

ibid

On 11 January 1919 Sir Hugh Trenchard was recalled to the R.A.F. to take the post of Chief of the Air Staff during the difficult period of adjustment to Peace conditions and later in the month Mr. Winston Churchill was appointed Secretary of State for the Air Force<sup>(1)</sup> in addition to his post as Secretary of State for War.

Air Ministry  
Weekly Order  
No. 67  
Jan. 1919

As foreshadowed in the Cabinet Paper, the Air Ministry in February appointed a Director-General of Production and Research to the Air Council. This was the precursor to the taking over from the Ministry of Munitions of the supply, design, and construction of aircraft.<sup>(2)</sup> At the same time the Air Ministry created a Department of Civil Aviation and appointed a Controller-General to the Air Council for setting up the necessary machinery to apply the Air Navigation Regulations.

Air Ministry  
A.P. 125  
P. 423

The reaction to all these proposals by the Admiralty was submitted to the Cabinet on 7 January 1920 and was generally favourable, particularly the provisions regarding the seconding of young officers and men of the Navy and Army for definite periods in the co-operation squadrons. The First Sea Lord (Admiral Wemyss) proposed that the complement of the Navy should be maintained at from 5 to 20 per cent (according to rank) above what was required to man the ships, and that this proportion should be seconded in periods of about two years to the R.A.F. afterwards returning for at least one year to carry out ordinary Naval work, when the question of their

War Cabinet  
Paper G.T.6613

A.H.B.  
ID2/100 -  
encls.2 and 3 -  
No. 3

- 
- (1) The designation of Secretary of State for Air was not officially introduced until March 1919.
  - (2) It will be remembered from Chapter I (ix) that the Director-General of Aircraft Production in the wartime Air Council was a Ministry of Munitions appointment with a seat on the Council. In the event this transfer to the Air Ministry did not actually take effect until 1 January 1920.

being seconded for a further period could be raised again. But there was a section in his memorandum which claimed that Air Force personnel afloat should form a definite part of the complement of warships and be entirely under Naval discipline. The formal acceptance of the complete programme for the Post-war Air Force was, he said, subject to further examination by the Naval Staff.

(ii) - Initial signs of controversy between the Services

This examination was completed in February and on the 20th the Admiralty forwarded a letter to the Air Ministry which included their requirements for the future Naval Air Policy. Among these there were the following specific claims:-

Admty. Letter  
M.0701

A.H.B.  
ID2/100  
Encl. 3  
Nos.4 and 5

1. As lighter-than-air craft for naval purposes differed essentially from those designed for civil purposes, it was necessary that the design and production of naval airships should be in the hands of the Admiralty.
2. All personnel required for naval air purposes afloat should be naval officers and ratings serving under the Naval Discipline Act but they should be trained in Air Force Schools. They should be entered as Naval Personnel and permanently classed as such. The necessary training in the flying of heavier-than-air machines over the sea should be undertaken by the R.A.F.
3. Regarding lighter-than-air craft, officers and men should be selected and trained by the Admiralty.
4. Heavier-than-air machines from shore stations, whose operations were controlled by the various Naval C.s-in-C., should as heretofore be provided and manned by R.A.F. Personnel. It was assumed that the Air Ministry would ensure the necessary training for the efficient performance of anti-submarine patrol duties.
5. The supply and equipment of Kite Balloons should be carried out by the R.A.F. but the officers and men should be provided and trained as in the case of lighter-than-air craft.

A.M. Letter  
B.9186  
22.3.19  
A.H.B.  
ID2/100  
encl. 3  
No. 6

With the exception of No.(4) the Air Council refused to accept any of these claims as they enunciated an entirely new policy contrary to that agreed to by the Admiralty in their War Cabinet Paper G.T.6613 of the 7 January. In any case these claims would, if accepted, be tantamount to the restoration of a separate Naval Air Service which was contrary to the policy embodied in the Air Force Constitution Act.

ibid  
encl.1  
and  
D.of P memo. to  
C.A.S. 14.5.19

Pending a reply from the Admiralty, there were exchanges of views among various departments inside the Air Ministry on the scale and conditions of co-operation with the Navy. These were inevitably bound up in speculation as to the ultimate basis of peace time air strength. One proposal went as far as recommending that as aircraft carriers were in fact mobile aerodromes, they should come completely under the command of the G.O.C. Royal Air Force (Marine) and have only a nucleus naval crew for steaming and navigation. Similarly there were interdepartmental opinions expressed in the

Admiralty but no official answer was given to the Air Council's letter until 9 August when the Admiralty adhered to their claim that the personnel for air work afloat must be Naval. They were, however, prepared to agree that in ships that were purely carriers 25 per cent of the officers should be R.A.F. seconded to the Navy for periods of one or two years at a time. They were unable to agree to the seconding of young Naval officers to the R.A.F. for any other purpose than for initial flying training.

Admty. Letter  
C.W.26451/19

A.H.B.  
ID2/100  
Encl.3 - No.11

A.M. Letter  
A.19438.

On 10 September the Air Council replied totally disagreeing with any seconding of R.A.F. officers to the Navy and as features of declared Cabinet policy they insisted on:-

1. That Naval officers be seconded to the R.A.F. for periods of not less than three years.
2. The responsibilities for training shall be at the discretion of the Air Ministry.
3. That the allotment of personnel for air units working with the Fleet shall be the responsibility of the Air Ministry.

A.H.B.  
ibid - No.15

Any failure to agree should be followed by recourse to the War Cabinet for final ruling.<sup>(1)</sup>

(iii) Demobilisation continues

Meanwhile demobilisation of the enormous wartime R.A.F. had been proceeding towards the approximate figures given in Lord Weir's scheme for the Postwar Air Force. By early April the number of operational squadrons on the Continent and Overseas had fallen to 44 with parallel reduction of the maritime air component. Added impetus was given to a fresh run-down when on 28 June 1919 the Treaty of Versailles was signed. Under Article 198 of this Treaty Germany was expressly forbidden to build or possess any military aircraft. In view of the fact that the only other European Air Power (France) was our close ally and because of increasing moves towards a more general disarmament it was decided to reduce very materially the home and continental air forces and only maintain a minimum of operational squadrons for our overseas commitments.

(a) Rationalisation of the R.A.F. and introduction of new ranks

The whole subject of R.A.F. personnel was in a state of flux during the Summer of 1919. In the midst of continuing demobilisation with no decision as yet on the ultimate strength of the R.A.F. the question of who would remain and under what conditions of Service was becoming acute. In July there were no permanent officers, those forming the R.A.F. at that time being under the following categories:-

- (a) Naval officers seconded from the Navy.
- (b) Army officers seconded from the Army.
- (c) Naval warrant officers commissioned by the R.A.F. from the Navy.

Memo. from  
C.A.S. to  
S. of S.  
July 1919

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(1) No reply was ever made to this letter. See Section (iv).

- (d) Temporary Army officers seconded from the Army.
- (e) Temporary officers in the R.A.F.

For months all these officers were asking what they were, whether they were to be sent back to the Navy and Army, or whether they were going to be kept in the Air Force and if so under what conditions. Discontent was rising and large numbers of good officers were resigning to seek employment elsewhere.

ibid

The Cabinet, after much discussion and examination of the problem decided it was absolutely necessary to get some foundation for a Permanent Air Force at once. As a preliminary measure they sanctioned an allocation of 1,500 permanent commissions and 2,500 temporary commissions for periods from two to five years. The problem was how to apportion these categories of commissions to the existing officer personnel without unfairness always remembering that many more junior officers were required than could hope for promotion to the relatively few higher ranks.

A.M.  
Weekly Order  
No. 973  
27.8.19

In August 1919 were gazetted the first postwar permanent commissions to the R.A.F. amounting to a total of 1,065 officers of all ranks and in the same month, 4 August, new standardised titles for officer rank came into force.<sup>(1)</sup> In the words of the Official Order "the new titles are to preserve and emphasise the principle of the independence and integrity of the Royal Air Force as a separate service among fighting services of the Crown. Hitherto the titles borne have been exclusively military in character, and as such they are not suited to a force which has not only to serve the special needs of the Army, but also those of the Navy, and in addition has a strategic and tactical sphere of action independent of the other two fighting services".

(b) - The creation of R.A.F. Coastal Area

During the Summer the Air Council made proposals to the Admiralty for a reorganisation of the R.A.F. units detailed to co-operate with the Navy. After an exchange of amendments

(1) the new ranks and comparison with the Navy and Army

Air Force	Navy	Army
Marshal of the Air	Admiral of the Fleet	Field Marshal
Air Chief Marshal	Admiral	General
Air Marshal	Vice Admiral	Lieutenant-General
Air Vice-Marshal	Rear-Admiral	Major-General
Air Commodore	Commodore 1st and 2nd Class	Brigadier-General
Group Captain	Captain of 3 yrs seniority	Colonel
Wing Commander	Captain under 3 yrs and Commanders	Lieutenant-Colonel
Squadron Leader	Lieutenant-Commander	Major
Flight Lieutenant	Lieutenant	Captain
Flying Officer	Sub-Lieutenant	Lieutenant
Pilot Officer	Chief Gunner	Second Lieutenant

Ref: A.M. Weekly Order No. 973 as amended by No. 1052 of 18.9.19.

SECRET

52

A.H.B.  
ID2/100  
encl. 3  
Nos. 7 to 14

during July and August, agreement was reached and on 15 September 1919 all air units working with the Navy, including airships, (1) were centralised administratively under the command of an Air Force officer with the title of Air Officer Commanding the Coastal Area with H.Q. offices in Thurloe Place, Kensington, London. (2)

The duties of this officer were:-

1. He was in command of all Air Units in the United Kingdom working with the Navy with the exception of personnel embarked in ships of His Majesty's Fleet.
2. He was adviser to the Board of Admiralty on all questions appertaining to Naval Aerial Policy (the C.A.S. acting as chief adviser).
3. He acted as adviser to the Naval C.s-in-C. at the various Home Stations.
4. He was directly responsible to the Air Ministry for training but kept in close touch with the Admiralty to ensure consideration of their views on this subject.
5. He was responsible to the Air Ministry on all questions of supply and maintenance of Air Units working with the Navy in home waters.

A.M.  
Weekly Order  
No. 1173  
24.10.19

The Coastal Area was organised into the following administrative groups:-

- (A) The operational units in home Naval Commands. For all operational purposes they continued, as heretofore, to work under the orders of the respective Naval C.s-in-C. who each had the senior combatant R.A.F. officer in the Command as his local adviser but on important questions of policy reference was to be made to the A.O.C. For all other purposes the Air Units were under the orders of the A.O.C. Coastal Area.
- (B) No. 29 Group. This consisted of the aircraft for embarkation on H.M. Ships together with their shore bases and establishments. When embarked in ships the personnel and material was under the command of and administered by the Naval Commander afloat. When on shore they came for all purposes under the Air Commanding officer No. 29 Group whose headquarters were at North Queensferry.
- (C) No. 10 Group. This consisted of the R.A.F. establishments engaged in training the R.A.F. and Naval Personnel required by Air Units co-operating with the Navy both at home and abroad. The headquarters were at Warsash, Southampton.

ibid

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- (1) In August it was decided by the Cabinet that the Airship Service should be transferred from the Admiralty to the Air Ministry with effect from 22 October 1919. Ref: A.M. Weekly Order No. 1181 of 30.10.19.
  - (2) The first A.O.C. Coastal Area was Air Vice-Marshal A. V. Vyvyan, C.B., D.S.O.

At the time of near-final negotiations in August the aircraft strength in (A) was eight squadrons (of which four were cadres) and six flights; (B) was two flights and 72 aircraft for warships; (C) was one squadron.

(iv) The Ten Year Ruling results in virtual liquidation of the R.A.F.

The pace of reduction and demobilisation became still more rapid after 15 August 1919 when Mr. Lloyd George's War Cabinet directed the three Service Departments to revise their estimates upon the assumption that the British Empire would not be engaged in any great war during the next ten years. The effect of this ruling coming on top of the provisions in the Treaty of Versailles hit the R.A.F. particularly hard. By October the Home and Overseas strengths had been cut a further 50 per cent and the maritime component in Home Waters reduced to three squadrons (of which one was a cadre) plus a few flights borne in H.M. Ships. Coastal Area therefore consisted only of Nos. 10 and 29 Groups at skeleton strength.

See Appendix IV  
and V

From October to December the headlong reduction continued amounting to a virtual liquidation of the R.A.F. and by the end of the year the total personnel in round numbers was only 4,000 officers and 31,500 other ranks. On 3 January 1920 it was announced that since the end of the war 26,087 officers, 21,259 cadets and 227,229 other ranks had been demobilised.

At home the R.A.F. consisted of:-

A Strike Force - Two squadrons.

Army Co-operation - One flight for each Army Division and one squadron for work with the Artillery.

Naval Co-operation - One reconnaissance squadron, a half squadron of torpedo planes and one flight each of fighter landplanes, float seaplanes and flying boats.

Under these conditions it had of course proved impossible to implement any of the programme outlined in Lord Weir's original scheme for the postwar Air Force (except for a much reduced overseas force). Even the August allocations to Army co-operation and the Coastal Area for naval co-operation were much reduced by the winter. Refusal to make allowances for this state of affairs or to give the Air Ministry time to "get its peacetime breath" resulted in more controversy with both the Admiralty and the War Office each of whom had at least a permanent edifice as a foundation on which to reconstruct their peacetime strength.

Details of the reduced allocations and a covering letter by the C.A.S. outlining the special difficulties attendant on the drastic and enforced run-down of the R.A.F. were forwarded to the Admiralty and War Office on 17 November. In his letter the C.A.S. stressed the fact that he would make every endeavour to provide the minimum establishment necessary to keep in being the co-operation of aircraft with the Navy and the Army but it would be at least two years before the reconstruction of the R.A.F. could take effect and the normal requirements met. He hoped the Staffs of the Navy and the Army would appreciate and allow for the special circumstances until the R.A.F. had got on its feet again.

A.H.B.  
ID2/100  
encl.17 and 18

The Admiralty replied rather unhelpfully on 20 November that they were surprised they had not been officially consulted about the effect of the demobilisation on the Naval requirements agreed to on 7 January 1919 before being confronted with the actual reduction now in November, and they hoped that in future a more normal procedure would be followed. A formal protest was sent by them to the Air Council on 9 December that provision for naval co-operation was inadequate and they wished to know when their previous list of requirements would be met.

ibid  
Nos. 19 to 21

ibid  
Nos. 22 and 23

This was answered on the 13th by the Air Council drawing their Lordships' attention to the fact that certain demands made by them in February had amounted virtually to a separate naval air service and had been refused by the Air Council on 22 March. A subsequent proposal made by the Council on 10 September to submit the argument to Cabinet arbitration had never been answered.

Further exchanges were interrupted by the publication of the new scheme for the Permanent Air Force.

(v) The Permanent Organisation of the Postwar R.A.F.

During the course of 1919 the C.A.S. (Sir Hugh Trenchard) had, under direction by Mr. Winston Churchill, been preparing a scheme for the permanent organisation of the Royal Air Force. This reconstruction on to a peace footing was a gigantic task of extreme difficulty as the Air Staff had, under the pressure of the Ten Years Ruling and rigid Government economy, been required to demobilise practically the whole force recruited and trained during the war. There was thus no framework available for a permanent force. The scheme was completed by the C.A.S. on 25 November and submitted to the Cabinet by whom it received immediate approval in principle. On 11 December the memorandum was laid before both Houses of Parliament as a White Paper (Cmd.467). As it ranks in importance with the earlier 1917 Report by Lieut-General Smuts and is in fact the fundamental charter for the R.A.F. there follow very copious extracts, as much of it concerned the permanence of the maritime component.

A.H.B.  
ID2/110  
encls. 4 to 18

Sir Hugh Trenchard opened by stating that the problem of forming the R.A.F. on a peace basis differed from that which confronted the older services. The whole Air Force was practically a war creation on a temporary basis. The personnel with few exceptions was enlisted for the duration of the war and accommodation had perforce to be of an entirely temporary character. It might be compared to the prophet Jonah's gourd in that the necessities of war created it in a night but the economies of peace had caused it to wither in a day and he was now faced with the necessity of replacing it with a plant of deeper root.

Cmd. 467

A.H.B.  
IHH/168/7

The principle to be kept in mind, he said, in forming the framework of the Air Service was that in the future the main portion of it would consist of an Independent Force together with Service personnel required in carrying out Aeronautical Research. In addition there would be a small part of it specially trained for work with the Navy, and a small part especially trained for work with the Army, these two small portions probably becoming in the future an arm of the older

services. (1) The governing principles were to concentrate attention on providing for the needs of the moment and to lay the foundations of a highly trained and efficient force which, though not capable of expansion in its present form, could be made so without any drastic alteration should necessity arise in years to come. Broadly speaking the principle was to reduce operational squadrons to the minimum considered essential for our garrisons overseas with a very small number in the United Kingdom as a reserve and to concentrate the whole of the remainder of our resources on perfecting the training of officers and men.

ibid

It was proposed to provide eight squadrons for India and three for Mesopotamia. As recent events had shown the value of aircraft in dealing with frontier troubles it was not too much to hope that before long it might be possible to regard R.A.F. units as a substitute for part of the military garrisons with all the advantage of speed of action, economy in cost and the saving of casualties. In Egypt it was proposed to station seven squadrons not only as a valuable means of communication but because they would be situated within easy reach of the most probable centres of unrest. This added to its natural weather advantages for aviation made it the obvious locality for a small R.A.F. reserve. In the Mediterranean there would be one flight of seaplanes at Alexandria and one flight at Malta.

ibid

The operational squadrons quartered in the United Kingdom, apart from those for co-operation with the Army and Navy, would number only two, eventually to be four, and would be employed on communication duties forming a small reserve in case of need. For co-operation with the Army it was proposed to provide eventually one flight per division for work with troop training and one or more squadrons for work with the artillery training and annual gun practice. For co-operation with the Navy it was proposed eventually to provide three landplane squadrons, one flying boat squadron and one float-seaplane squadron. Landplanes would no longer be carried permanently in capital ships as was done during the war but would be embarked only when required to take part in Fleet exercises. The landplane squadrons would consist of one reconnaissance/spotting squadron, one of fighters, and one of torpedo carrying machines. The two former would be based on the Firth of Forth and the latter at Gosport, together with a small experimental unit in order to develop fully this important form of naval co-operation.

The Admiralty proposed to keep two aircraft carriers in commission, one being equipped with float seaplanes for service in the Mediterranean and the other remaining at home to be used primarily for training and experimental purposes but ready if necessary to embark a flight of torpedo or other type machines.

- 
- (1) In after years it was established personally from Sir Hugh Trenchard that he bitterly regretted the sentence underlined. He had no intention of holding out any possibility of separate air services but merely intended to indicate a very close co-operation with the two older Services while remaining an integral part of the R.A.F. He had made this view quite clear to the First Sea Lord (Lord Beatty) in a personal letter dated 22 November 1919 (A.H.B. ID2/100 encl.2A). Unfortunately this somewhat ambiguous wording in the memorandum was to provide much ammunition for the opponents of the separate R.A.F.

The Airship Service was, he said, a difficult problem. The cost of large rigid types in peace was prohibitive and their use in war was still in the experimental stage. It was proposed therefore to keep only one station (Howden) in full commission and to retain as a start one large rigid and two non-rigids purely to allow research and development to continue.<sup>(1)</sup>

Then followed the heart of this memorandum under the heading of the extreme importance of training. Sir Hugh prefaced this section by a statement that the present need was not the creation of the full number of squadrons we might eventually require to meet strategic needs but was first and foremost the making of a sound framework on which to build a Service which, while giving us now a few essential operational squadrons adequately trained and equipped, would be capable of producing whatever time might show to be necessary in the future. In this respect the matter of supreme importance was research. This was the underlying reason for the transfer of the Departments of Supply and Research from the Ministry of Munitions to the Air Ministry. Steady and uninterrupted progress in research was vital to the efficiency of the Air Force and on it depended the leading position we had established at such heavy cost during the war. The existing establishments must therefore be retained.<sup>(2)</sup>

Before explaining the training proposals in detail, he laid down certain postulates. It was essential to create an Air Force spirit or rather to foster the spirit which had existed to a high degree during the war and to perpetuate it during the peace years. Apart from preserving in the permanent units the designating numbers of squadrons which had made great names for themselves during the war, this object could only be attained by:-

- (a) The creation of an Air Force Cadet College for permanently commissioned officers.<sup>(3)</sup>

- 
- (1) Later in 1920, under the stringent economy policy of the Government, the money proposed in the preliminary 1921 Air Estimates for construction and development of airships had to be cut. Before taking this action the Air Ministry consulted the Admiralty who replied in November 1920 that "the disadvantages of airships at the present time were considered too serious to warrant their inclusion in naval air forces and they were against the retention of even a small airship organisation if it would in any way prejudice Naval requirements for heavier-than-air squadrons." Accordingly the Air Ministry abandoned the Service airship and the decision thus agreed with the Admiralty was duly reported to the Committee of Imperial Defence. Ref: A.H.B./IIK/54/10/10 encl.13.
  - (2) The principal research establishments were at Farnborough, Biggin Hill, Martlesham Heath and Isle of Grain. Airship research was carried out at Cardington and Howden.
  - (3) The R.A.F. Cadet College was opened at Cranwell in February 1920 with Air Commodore C. A. H. Longcroft as the first Commandant. Permanent buildings were not completed for some years and were formally opened by H.R.H. the Prince of Wales on 11 October 1934.

Ibid

- (b) The creation of an Air Staff College.<sup>(1)</sup>
- (c) The enlisting of the bulk of the skilled ranks as boys and training them ab initio in the Air Service.<sup>(2)</sup>

There followed details of the training proposed for both officers and men. Regarding officers, it was stated that owing to the necessity of a large number of junior officers with a relative paucity of higher appointments it was not possible to offer a career for all. Consequently only some 50 per cent of the officers required had been granted permanent commissions, the remainder being obtained on short service commissions<sup>(3)</sup> or by seconding officers from the Army and Navy. Great importance was attached to the last class since an interchange of officers was bound to make for closer and more intelligent co-operation between the Services. Mention was made of two other minor channels of entry for permanent commissions, these were from the Universities and from the ranks. A list of technical schools was given for instruction in Gunnery, Navigation, Engines, Wireless, Photography and a school for flying instructors.

Regarding the higher organisation in the United Kingdom, all units working with the Navy had recently been formed into one Command known as the Coastal Area R.A.F. The two remaining Commands now known as the Northern and Southern Areas would in April 1920 be amalgamated into one Command to be known as the Inland Area. Each Area would have its Repair Depot, at Henlow for the Inland Area and at Donibristle for the Coastal Area.

When reading through this very comprehensive document, it must be realised that a policy of rigid economy and retrenchment was being pursued by the Government and Sir Hugh Trenchard was compelled to plan in the sure knowledge that for many years to come there would only be very small funds available for the Air Service. It is a measure of his far sighted wisdom that the major proportion of these limited resources were devoted to carefully planned training and research programmes instead of to current production of contemporary aircraft. We thus avoided the error of building a numerically imposing front line force such as was done by France and which on the approach of war was found to be largely obsolete.

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- (1) The R.A.F. Staff College was opened at Andover on 4 April 1922 with Air Commodore H. R. M. Brooke-Popham as the first Commandant.
  - (2) Halton Park, with its well equipped technical shops, was decided on as the most suitable place for this training. Until full accommodation was built, use was made also of Cranwell and Eastchurch for housing. It was not until the end of 1926 that all aircraft apprentices could be accommodated at Halton Park.
  - (3) Thus started the Short Service Scheme and it originally applied to pilots who had previously served in the Air Force. Ref: A.M. Weekly Orders Nos. 781 and 866 of July 1919. At the end of 1920 the Scheme was extended to civilian candidates.

(vi) Naval reaction to the Scheme

Admty. Letter  
M.05304

A.H.B.  
ID2/100  
encl. 3  
No. 24

After perusal of the document the Admiralty immediately pounced on the section containing Trenchard's unguarded statement that the two small parts of the Air Force specially trained for work with the Navy and Army would probably in the future become arms of the older Services. This, the Board said, was entirely in accordance with their views and they would like to see it take place immediately. They also claimed as a corollary that it must include all personnel and material in connection with naval air work either afloat or on land including the lighter-than-air craft. In the course of this long letter they claimed control over money voted by the Government for naval air co-operation, the appointment of naval observers for reconnaissance, torpedo firing, bomb dropping, and a free hand in arranging periods of service for naval officers, suggestions for research, and development of types of aircraft.

ibid  
encl. 3  
No. 25

The Air Council in their reply were first concerned to correct the erroneous interpretation of the words "probably in future become an arm of the older Services."<sup>(1)</sup> Furthermore they could not accept the Admiralty's renewed claim to the air personnel and material employed on naval air work as this amounted to a separate Naval Air Service, neither could they countenance any financial provision for a part of the R.A.F. being in the charge of the Admiralty and finally they adhered to their opinion that the provision of personnel for air work must be their responsibility.

Admty. Letter  
M.O. 203  
18.2.20.

A.M. Letter  
A.19438/S6  
19.3.20

A.H.B.  
ID2/100  
encl. 3  
Nos.28 and 29

A month later the Admiralty accepted these refusals and assured the Air Council that they had no desire to establish a separate Naval Air Service. The letter went on to ask whether the naval officers seconded to the R.A.F. would be employed entirely on naval co-operation work or not, and invited the Air Council's agreement as to the extent naval control should be exercised over air operations. In reply the Air Council said they did not envisage that every seconded officer should necessarily carry out air work with the Navy for the whole of his seconded period but that some should gain useful experience for short times in the other branches of the Air Service. Regarding operational control they agreed that this should be exercised by the Admiralty over all air units embarked in and flown from H.M. warships and aircraft carriers, and when not flown from ships, over only those aircraft allotted for air work with the Fleet. It would not apply to air operations originated by the Air Staff for the full execution of which the assistance of the Navy had been invoked. Finally the Air Council came out with a memorable statement on the inter-Service relations which can well be quoted in full:-

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(1) This matter had already been raised in the House of Commons by Colonel Moore Brabazon and the meaning made clear that the R.A.F. working with the Navy always remained a part of the R.A.F. The section specially trained for work with the Navy in which were naval officers seconded to the R.A.F. was an arm of the Navy only in that they would not normally be regarded as available for other R.A.F. purposes. The principle for the Army would be the same. Ref: Hansard, Vol.223 No.151 p.16, also A.H.B./ID2/100 encl.3 No.25.

ibid

"Any Air Force units which are maintained for the purpose of naval co-operation must come absolutely under the command of the local senior naval officer in order that unity of command may be secured in all tactical operations. At the same time naval officers in their dealings with the senior officer of the R.A.F. under them will not lose sight of the fact that he is not a subordinate of their own Service but will remember that he belongs to a different Service, for the administration of which a separate Ministry is responsible. The usual procedure will be for the senior naval officer to indicate the object he has in view to the R.A.F. officer concerned, leaving it to the latter to determine the method of execution."

See  
Location of  
Units App. V  
for March 1920

During January and February the postwar Air Force was gradually taking shape on the solid foundation laid by Trenchard's White Paper. At the time of the introduction of the Air Estimates in March 1920 there were in all 23 full squadrons, four more in cadre and six new squadrons in process of forming. Most of the full squadrons were in Overseas Commands located in accordance with the White Paper proposals. At home there were in the Inland Area and Ireland three full squadrons, three more in cadre and one forming, and in the Coastal Area there were two full squadrons, two forming and one in cadre. No immediate increase was contemplated, the whole effort being concentrated on bringing these squadrons up to strength and on training. All that the C.A.S. wished for was to be left unhindered by controversy for a space in order to consolidate and the prospect appeared rosy as the Admiralty's assurance in their letter of 18 February had been reaffirmed in the First Lord's statement when introducing the Navy Estimates for 1920/21 (Cmd.649). In the appended "Notes on Naval Policy", paragraph 78 reads as follows:-

"To remove all misconception it should be stated with emphasis that we in no way contemplate a return to a separate Naval Air Service. It is recognised that the Air Ministry was created by Parliament as the result of war experience to further development and maintenance of air power, and to separate entirely from the Air Ministry that part dealing with the Navy would be to retard progress and result in a weakening both in development and the training of air personnel."

(vii) Training and Secondment

A.H.B.  
ID2/100  
encl.4  
Section (3)

The questions at issue now left the sphere of high policy and became semi-official discussions between the Air Ministry Director of Personnel and the Second Sea Lord as to the seconding of officers from the Navy and the form of training to be adopted. While the period of demobilisation had been progressing in 1919, training was, as heretofore, devoted mainly to airmanship in all its forms and it was expected that in the co-operation squadrons the other two Services would continue to provide their own officers to do any necessary observer work. Neither the Admiralty nor the War Office had questioned this until 9 July 1919 when the latter convened a conference on this matter. It was then agreed that Army officers should be trained for artillery spotting and long range reconnaissance observers. This was modified by the Air Council on 7 February 1920 on the grounds that to obtain knowledge on long range reconnaissance it must

be fought for and therefore involved the question of air fighting tactics so that for this duty the observers must be R.A.F. officers. The Army Council had no objection and indeed saw no real reason for Army officers necessarily to do artillery spotting either.

With the Navy the question of observers did not arise until the end of 1919 as there were up till then a number of ex-Naval Warrant Officers available who had performed these duties during the war. The question of their replacement was considered and in January 1920 the Air Council informed the Admiralty that they had the matter of Observers for Naval Co-operation under attention. On 26 May the C.-in-C. Atlantic Fleet reported through the Admiralty that the training for pilots and observers with the Fleet was not satisfactory either for spotting or reconnaissance as they did not get sufficient instruction in Fleet procedure. Resulting from discussion within the Air Ministry it was decided to put up a proposal to divide naval observation work into three sections:-

1. Gunnery Spotting.
2. Reconnaissance for the Fleet.
3. Patrol work (Coastal and Anti-submarine).

Gunnery Spotting should be done by a naval officer who would be attached to the R.A.F. during training but not seconded. The same procedure would apply to W/T operators who would be naval ratings.

Reconnaissance for the Fleet was considered to entail having to fight for the information rendering it essential that the observer should be an R.A.F. officer.

Patrol Work would be done entirely by shore based aircraft and was therefore an R.A.F. function.

A scheme on the above lines was forwarded to the Admiralty on 19 August and, after two reminders, the Admiralty replied on 22 December concurring as regards Gunnery Spotting and Patrol Work but stating they considered reconnaissance, even more essentially than spotting, called for Naval officers because it required considerable naval knowledge to make correct reports and deductions; moreover they thought a Naval officer could easily receive sufficient training in aerial fighting and air tactics.

While not agreeing with the latter statements, the Air Ministry went ahead from January 1921 with arrangements to train attached Naval officers and W/T operators for Gunnery Spotting. Nothing further transpired about observers until 22 July 1921 when the Admiralty informed the Air Council that they had decided to form a special branch of the Royal Navy for observers on similar lines to other specialist branches for gunnery, torpedo etc. The year ended with a letter from the Air Council inviting discussion as to the future of these specialised Naval observers and pointing out that their training must be under the control of the A.O.C. Coastal Area and their qualification assessed by him.

Regarding the issue of secondment we must go back to early 1920. In the Admiralty view the four year period accepted by

ibid

ibid

ibid

SECRET

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A.H.B.  
ID2/100  
encl.4  
Section (2)

the Army Council was impracticable in the Navy as an officer would lose all touch with the conditions of his sea profession. On 13 February 1920 the Air Council put forward proposals of which the principal points were:-

1. That Naval officers seconded would be given commissions in the R.A.F. as Flying officers.
2. That they would have the rank, pay, and authority of their Air Force grading for all R.A.F. purposes.
3. That they would wear the Service dress of R.A.F. but retain the full dress and mess dress of the Navy.
4. That they would be seconded for three years - any extension being subject to the concurrence of the Admiralty.

ibid

The Admiralty deferred their answer until 24 April when they replied that further discussion was necessary but in order that there might be no delay in starting the training, twelve officers would be loaned (not seconded) for one year, at the end of which time it was hoped that agreement could be reached. To this the Air Council objected that if the officers were withdrawn or at liberty to withdraw after their year's initial training, the expense of that training would have been incurred without any corresponding service in return. They suggested three years as a minimum and insisted that these officers must be seconded to the R.A.F. and, while reserving complete freedom with regard to their posting, they had no intention of employing any considerable proportion otherwise than in appointments connected with naval work.

On 15 June 1920 the Admiralty agreed to secondment for three years and further stated that they concurred with the Air Council that it was in the interest of the Navy as well as of the R.A.F. for free circulation of officers to take place between the different branches of the Air Service but added that they must insist that naval work should primarily be done by officers seconded from the Navy. The Air Council, who had been continually pressing to get the matter settled, replied on 28 June agreeing to take twelve naval officers for training under the agreement now reached.

The Admiralty promulgated a notice to the Fleet in July and on 10 August sent the names of nine officers. On examination only seven of these were found to be medically fit and on 27 November the Air Council pressed the Admiralty to arrange for further supply as valuable time was being lost and training facilities kept open without result. Nothing transpired until 10 January 1921, when the Admiralty made a lengthy reply stating that the notice to the Fleet had revealed few volunteers and suggesting a reconsideration of the conditions. This revolved around the points put forward by the Air Council nearly a year before in February 1920. The Admiralty now stated:-

1. That three years secondment was too long as the officers would be at a disadvantage on return to the Navy and they therefore proposed a reduction to two years.

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2. That Naval Lieutenants seconded should be paid as Flight Lieutenants and not as Flying officers.
3. That there was great feeling against wearing R.A.F. service dress.
4. That a definite promise should be given of employment in naval aircraft.

ibid

To this the Air Council replied on 18 January 1921 that they could not accept these proposals because firstly, a two year period would be a waste of money in training; secondly, the proposed rate of pay would create injustice to R.A.F. officers; and thirdly, it was impracticable to exercise authority in R.A.F. stations in naval uniform and moreover those officers already seconded had accepted the change without demur. Finally the Council said that they must now try and make up, by training from other sources, the valuable time which had been wasted over this discussion. If the Admiralty wished a further conference they would be glad to arrange. After another month's delay the Admiralty concurred in the advantage which would have accrued had the scheme been successful but as sufficient volunteers were not forthcoming they considered it desirable to postpone further discussion until it was known what response was made to a call for Naval officers to volunteer for duty as observers which they were proposing to make.

C.I.D. 136C  
April 1921  
A.H.B.  
IB/4/4

It is difficult to resist the conclusion that the Admiralty had no real intention of trying to make a success of any secondment scheme but were determined to have complete control over at least the observer branch. This insistence on the reconnaissance side to the exclusion of all else was high-lighted in a C.I.D. paper by the Naval Staff in April 1921 in which they considered "that for Naval work it is the qualities of observation and reconnaissance rather than attack which are likely to prove the most valuable in the future development of aircraft and which enable them to act on occasion as a substitute for the corresponding Naval Surface units".

However, this paper was one of several circulated at the time by both the Admiralty and War Office which opened the first big battle against the Air Force and which is dealt with in the next chapter.

CHAPTER IV

INTER-SERVICE CONTROVERSY - 1921 TO 1923

(i) Proposal to discontinue the construction of battleships

Cabinet and  
C.I.D. Memos.  
N.1 to N.5  
A.H.B./ID2/88

In November 1920 the Admiralty requested a Cabinet decision on the whole question of naval strength. The Government's policy of a "One-Power Naval Standard" required a new construction programme to be started in the financial year 1921/22. This had to include several battleships which the Naval Staff considered would remain the standard major unit for at least 20 years. There were many, however, who thought that the growing attack potential of submarines and aircraft would render the battleship obsolete long before this date. Public interest was focused on the subject by a series of articles in the "Times" newspaper during December 1920 by Rear-Admiral Hall in which he claimed that not only was the battleship doomed but that our sea supremacy could be as adequately and more economically maintained by relatively light surface craft, submarines and aircraft.

N.S.C.2.  
A.H.B./ID2/88

On 29 December the Prime Minister directed that a Sub-Committee of the Committee of Imperial Defence<sup>(1)</sup> should meet to hear evidence on the question of the capital ship in the Royal Navy and report such evidence and opinions to the main Committee. The Sub-Committee<sup>(2)</sup> heard a mass of expert evidence from Naval and Air Force officers. As might be expected the more senior naval officers supported the battleship but others of lesser rank considered the submarine as a dangerous menace. Successful aircraft attack with heavy bombs was discounted because of the great height of release necessary for penetration and the consequent difficulty of hitting the target, while effective air attack with torpedoes from low altitude were held to be unlikely in view of the projected new multi-barrelled A/A pom-pom armament. Regarding the submarine menace, aircraft were not considered to constitute any threat by direct attack but their presence over infested waters was held to be of value in forcing the submergence of any hostile submarines lying in the path of a squadron or convoy and so restricting their tactical radius of attack. The Chief of the Air Staff in his evidence made no claims for existing air attack possibilities but he was confident that, given the money for development, in 10 years time the efficiency of attack could be so improved that aircraft would be able to sink battleships within a radius of 500 miles from a shore station. Meanwhile he considered that steps necessary to obtain and maintain supremacy in the air were more important than building capital ships with their questionable value to sea supremacy.

A.H.B./ID2/89  
encls. 1 to 14

ibid  
encl. 12

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- (1) As the Committee of Imperial Defence and its sub-committees feature frequently in the subsequent text of this volume, an explanation of its history, position and authority is given at Appendix VII.
  - (2) The Sub-Committee was composed as under:-
    - Mr. A. Bonar Law (Chairman)
    - Mr. Winston Churchill - Secretary of State for Air
    - Mr. W. H. Long - First Lord of the Admiralty
    - Sir Robert Horne - Chancellor of the Exchequer
    - Sir Eric Geddes - Minister of Transport
    - Admiral of the Fleet Lord Beatty - First Sea Lord

C.I.D. N.11  
A.H.B./ID2/88  
encl. 10

After long and careful consideration of both written and oral evidence, the Sub-Committee, although differing amongst themselves on minor points, came to the conclusion that the capital ship remained the basis of Sea Power and that in any period of time with which they were concerned there was no development likely to occur to alter this position. Their report to this effect was issued on 2 March 1921.

(ii) The Balfour Sub-Committee on the role of the Air Force

Arising out of the statements and opinions expressed during the course of the Bonar Law Enquiry, the Air Staff prepared a paper dealing with the role of the Air Force in the system of Imperial Defence. This was circulated by Mr. Winston Churchill as C.I.D. paper No. 135C later in March 1921. Briefly the claims put forward were as follows:-

A.H.B./IB/4/4

- (a) The primary function of the Air Force in the future would be the defence of these Islands from invasion by air from the continent of Europe. This defence would largely take the form of a counter-offensive from the air assisted by a ground organisation co-ordinated by the Air Ministry.
- (b) Certain responsibilities at present assigned to the Navy and Army could be more economically and just as adequately carried out by Air units, notably the maintenance of order in certain areas of unrest in the Middle East, the protection of the British Islands from Overseas invasion, coast defence and the protection of merchant shipping in certain areas.
- (c) Under present conditions the strength of the R.A.F. at home was absorbed by its functions as an auxiliary to the Navy and Army, and, while the proper discharge of these functions was of vital importance, there should be more use made of the Air Force as an independent arm used not as an auxiliary but as a substitute for Naval and Military forces.

A.H.B./ID2/68(B)  
pages 5 and 6

This paper may be considered as the starting point of the more serious controversy which ranged with varying degrees of intensity for the next four or five years. It was quickly followed by memoranda prepared by the Naval and General Staffs which vigorously resisted most of the claims put forward by the Air Staff.(1) Other papers dealing with the various aspects of the problem and the extent of co-operation between the Services were circulated in the ensuing weeks.(2) These papers and memoranda were considered by the Committee of Imperial Defence and they empowered a Standing Defence Sub-Committee, under the chairmanship of Mr. A. J. Balfour (Lord President of the Council), to go into the whole question.

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- (1) By the Admiralty - C.I.D. 136C (21/4/21) and by the War Office - C.I.D. 139C (25/5/21). Ref: Both are in A.H.B./IB/4/4.
  - (2) By the Admiralty - C.I.D. 270B (7/5/21)  
By the War Office - C.I.D. 272B (7/6/21)  
By the Air Ministry - C.I.D. 140C (27/5/21), 141C (June 1921) and 275B (16/6/21).  
Ref: All are contained in A.H.B./IB/3/2 and IB/4/4.

A.H.B.  
IHK/54/10/10  
and  
ID2/68(B)  
page 6

Accordingly the status and duties of the Air Service were investigated by this Sub-Committee during the early summer of 1921 and each of the three Services stated their views both orally and in writing. It was found impossible to arrive at any decision which was acceptable to all three fighting services and a memorandum (C.I.D. 149C) was therefore issued by Mr. Balfour on 26 July 1921 in which he drew the following conclusions:-

1. That the Air Force must be autonomous in matters of administration and education.
2. That in the case of defence against air raids the Army and the Navy must play a secondary role.
3. That in the case of military operations by land or naval operations by sea the Air Force must be in strict subordination to the General or Admiral in supreme command.
4. That in other cases, such as the protection of commerce or attack on enemy harbours or inland towns, the relations between the Air Force and the other Services must be regarded rather as a matter of co-operation than that of the strict subordination necessary when the aeroplanes were acting merely as auxiliaries.

ibid

Mr. Balfour ended by saying that this threefold relation between the Air Force and the two other Services had no exact precedent and would undoubtedly require tact and judgement on the part of the Departments concerned. But it seemed to him to be logical and he was convinced that any attempt to reduce the new Air Force to an inferior position would seriously hamper its vigorous development and might put us at a serious disadvantage compared with nations who, for whatever reason, had abandoned rivalry at sea and desired to exploit to the utmost the new weapon whose edge could not be completely turned by any hostile superiority in fleets or armies.

C.I.D. 153C  
A.H.B./IB/4/4

C.I.D. 150C  
A.H.B./IIA/1/47  
encl. 5

ibid  
encl. 6

Some of these conclusions were not agreed by the Admiralty, particularly those in which the Air Force was regarded as an equal partner in co-operation. In a memorandum the First Sea Lord said that 'he knew of no operation in which the Navy and the Air have to co-operate in which the Navy would not play a more important part than the Air Service'. The General Staff refused to accept any part of the conclusions and the C.I.G.S. (Sir Henry Wilson) came out with a long and aggressive memorandum in which he criticised Mr. Balfour's judgement, restated his claim for the abolition of the autonomous Air Force and ended by demanding an examination into the Air Force finances which, he said, would reveal the extravagancies of the Third Service. In a brief reply, the Chief of the Air Staff expressed his amazement at this intemperate attack, drew attention to the more glaring errors and mis-statements, and concluded that it was the bitterness of failure which caused the Chief of one great Service to make the unprecedented demand for an examination into the finances of another - an attack perilously akin to Satan rebuking sin. However, the Air Force would welcome such a scrutiny provided it embraced all three Services.

(iii) The Geddes Committee and subsequent Cabinet Committee

The Government had already appointed a Committee to enquire into National Expenditure and their investigations naturally covered the question of the cost of the three fighting services. Known as the Geddes Committee they had started their examination at the end of August 1921. The members were:-

Sir Eric Geddes (Chairman)  
Lord Inchcape  
Lord Faringdon  
Sir Joseph Maclay  
Sir Guy Granet  
Mr. G. A. Steel (Secretary)

The terms of reference were to make recommendations to the Chancellor of the Exchequer (Sir Robert Horne) for effecting forthwith all possible reductions in the National Expenditure on Supply Services. In so far as questions of policy were involved in the expenditure under discussion, these would remain for the exclusive consideration of the Cabinet; but it was open to the Committee to review the expenditure and to indicate the economies which might be effected if particular policies were either adopted, abandoned or modified.

The Committee soon reported that the subject was of such complexity and the need for retrenchment so imperative that they proposed not to delay a report until the whole field had been covered but to deal with Departments where great expenditure was involved as it was there that substantial economies must be looked for. Their recommendations therefore came out as interim reports. The first of these was divided into three parts. Part I covered the Fighting Services, Part II dealt with Education, Health, Labour and Old Age Pensions, and Part III reviewed the question of War Pensions. Other interim reports followed at intervals and the Final Report was not issued until 21 February 1922.

A.H.B./ID2/64

In this Narrative we are only concerned with Part I of the First Interim Report which was submitted to the Chancellor of the Exchequer in December 1921. In it the Committee noted that in 1919 the Government had given instructions that the estimates for the three Fighting Services were to be framed 'on the assumption that no great war was to be anticipated within the next ten years'. The Navy now based its estimates upon the principle of a 'One-Power Standard' which had been adopted by the Government. The Army estimates were now framed to provide certain garrisons overseas with a system of reliefs for those garrisons known as the 'Cardwell System'. The Air Force based its estimates on different considerations in that they provided for the air needs of the Navy and the Army, and for the maintenance of a small independent force as a reserve. They also provided large sums of money for education, training and research in the art of air navigation and fighting, and for civil aviation. The Committee was much struck with the fact that, in spite of the above reduced commitments, in the Provisional Service Estimates for 1922/23, the fifth year after the Armistice, with a broken and exhausted Europe and with no German menace, we were to have far greater fighting power, a larger personnel and greater preparations for war than ever before in our history. They were of the opinion

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that these Estimates lacked co-ordination and until co-ordination was attained much overlapping and wasteful expenditure was inevitable.

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The Navy and Army had both urged orally and in writing that the most effective and most economical use could not be made of their Air Arms so long as the personnel was controlled by another Service and suggested in general terms that economies could be effected by the transference of these air forces to their control. The War Office also suggested economies in supply, transport, education and medical services which would result from such transference.(1) The Committee did not accept this proposal and pointed out that by dividing the Air Force between the two Senior Services duplication would be inevitable with consequent extravagant waste. There was the further disadvantage that without a separate existence there was a grave danger that the Air Service would be unable to work out developments which might, in the next decade or so, entirely revolutionise methods of attack and defence thus rendering possible very large economies in the cost of the Fighting Services as a whole by substituting Air for Land or Sea Forces.

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The Committee had not been convinced that the Air Force was less economically administered than the other two Services but they were impressed by the fact that public funds were being spent in both the older Services because of their overlapping with the Air. However, in their opinion full economy could not be realised under existing conditions - the three Forces must be brought under a Co-ordinating Authority such as a Ministry of Defence, and such a Ministry in embryo already existed in the Committee of Imperial Defence. All the arguments urged for the absorption of the Air Force into the two older Services applied also to the fusion of the three Services under one Minister and great importance was attached to a settlement of this question.

A detailed examination of each of the Service Estimates for the year 1922/23 followed in the report. Drastic cuts were recommended in all three Services - the Navy from £81 million to £60 million, the Army from £75 million to £55 million, and the Air Force from £18½ million to only £13 million which included the cost of air forces in Iraq, Palestine and Egypt.

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encls. 4 and 6

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encl. 5

January 1922 was spent by the Service Departments in pondering these unwelcome reductions. Upon careful scrutiny of the Committee's figures for the £5½ million cut, the Air Ministry discovered several anomalies and misapprehensions under which the proposed cuts would only amount to a total saving of £2½ million. Furthermore this sum could equally be saved by economies in other directions which did not bear so heavily on the squadron strength at home. Their revised figure was given as £11 million excluding the air forces in the Middle East. The Admiralty criticised the Report where it touched upon the relations between the Navy and the Air, particularly on the Committee's statement that the absorption of the Air Force by the two older Services must result in

(1) This suggestion was again included in C.I.D.159C which the Secretary of State for War (Sir Laming Worthington-Evans) sent to the Cabinet on 4 February 1922. See sections (iv) and (viii).

wasteful duplication in experimental, design, supply and training. They also protested strongly against the proposed drastic reduction in the number of R.A.F. squadrons allocated to Fleet work.

Memoranda on these points as well as general protests by all three Services against the severity of the cuts were considered by the Cabinet who appointed a Committee to adjudicate on the Geddes Committee recommendations. The Committee consisted of:-

Mr. Winston Churchill - Secretary of State for the Colonies (Chairman)  
Lord Birkenhead - Lord Chancellor  
Mr. E. S. Montagu - Secretary of State for India  
Mr. Stanley Baldwin - President of the Board of Trade

They made their report on 4 February 1922 and as far as concerned the proposed Air Force Estimates, only a reduction of £ $\frac{1}{4}$  million on the revised figure was decided as any further economy would have to be at the expense of schools and training establishments at home necessary to create a well-disciplined and efficient Air Force. The Committee was strongly impressed, as had been the Geddes Committee, by the sense of economy and thrifty administration possessed by the Chief of the Air Staff. They did not feel that there was any large opening for further pruning as the result might well be to destroy the efficiency of the whole force and to a large extent waste such funds as were still allocated to it. The Air Estimates were therefore considered reasonable at £10 $\frac{3}{4}$  million excluding the Middle East air forces.

(iv) Further attacks on the Autonomous Air Force culminate in a Government pronouncement

The War Office, who had refused to accept the Balfour Sub-Committee conclusions, now ignored the opinions expressed by the Geddes Committee and early in February 1922 the Secretary of State for War (Sir Laming Worthington-Evans) laid before the Cabinet a paper proposing the transfer of the Air Ministry to the War Office. The Secretary of State for Air(1) in opposing this claim recapitulated the more recent cases in which similar demands by both the Admiralty and War Office had been overruled by impartial arbitration and deplored the perpetual controversy which was good for none of the Services and led to nothing but discord. He said that economies were more likely to result from willing and sympathetic co-operation than from the conditions brought about by these constant efforts to create friction by advocating the abolition of the Air Ministry whenever an opportunity presented itself. Point was added to these remarks when almost simultaneously the Admiralty launched a full blooded attack in a memorandum circulated to the Cabinet which included the following:-

"The Admiralty is the sole authority responsible for the defence of our sea communications, and has in the past been responsible for advising as to the whole of requirements for carrying out the naval policy of the Government

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(1) This was Captain F. E. Guest who had taken over the post from Mr. Winston Churchill on 14 February 1921.

C.P. 3692A  
appendices  
A.H.B./ID2/65  
encl. 7

C.P. 3692  
ibid  
encl. 7

C.I.D. 159C  
which became  
C.P. 3681  
A.H.B./IB/4/4

C.I.D. 161C and  
162C which  
became C.P. 3735  
and 3736  
A.H.B./IB/4/4

C.P.3700  
containing  
C.I.D.1600

and for seeing that the expenditure approved is allocated to the best possible advantage.

A.H.B.  
IIR/54/10/10

The advent of the air weapon, which has become an integral part of our Fleets, has provided the sole exception to this wise rule. The efficiency of the Fleet and its tactical and strategical employment are largely dependent upon the efficiency of aerial equipment. The strength of naval air units depends upon Air Ministry finance. The Navy needs an air personnel totally different from that which the Air Force requires."

"It would be undesirable, in fact it is impossible, fully to develop in this memorandum the argument in favour of the abolition of the Separate Air Force. It can only be said that the Admiralty are convinced of the necessity for this step both from the point of view of economy and efficiency."

C.I.D.1630  
which became  
C.P.3754  
A.H.B./IB/4/4

These main issues together with a recapitulation of previous arguments by the three contending Departments were summarised in a C.I.D. Paper by the Secretary (Sir Maurice Hankey) and submitted to the Cabinet on 17 February 1922.

Cabinet Office  
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After once again considering the opposing arguments, the Cabinet endorsed the previous conclusions of the July 1921 Balfour Sub-Committee and on 15 March 1922 decided that these findings should form the basis of a Governmental pronouncement in the House of Commons which should include a further statement that, while the Government did not propose to lay down a policy for all time, the separate Air Ministry should be maintained and that a sub-committee of the Committee of Imperial Defence should be appointed to enquire into the existing system of Naval and Air co-operation and to advise as to the way in which the Air Force could give to the Navy the air service which the Navy requires.

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encl. No.12

Accordingly on 16 March 1922, in the House of Commons, the Lord Privy Seal (Mr. Austin Chamberlain) made a long statement in the course of which he recapitulated in somewhat biting terms the rivalries between the Army and Navy which had made necessary the creation of the Air Ministry and the constitution of a separate homogeneous Air Force stressing the fact that it was not theory derived from speculation in the past but was practical experience after trying a great many other experiments which with the deficiencies they left proved the necessity of creating the system now in force. He did not want it thought that the Government were blind to the difficulties of the present system or to the present lack of perfect harmony but in the Government's view the objections to the re-absorption of the Air Force by the Navy and Army were far greater than any objections which could be raised against the separate Air Ministry and Staff. He went on to say that as a result of recent deliberation the Government had come to certain decisions on policy which could not be confined to the naval considerations alone of co-operation between the Air Force and the Navy but must cover a survey of the whole position. He then read out the four principles enunciated by the Balfour Sub-Committee and said that the Government would appoint either a Standing Committee or the Sub-Committee of the Committee of Imperial Defence to examine carefully into the system of naval and air co-operation and to advise on how best we could secure that the Air Force should be enabled to render to the Navy the aid that they may require. Finally, in

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summing up, he said 'the Government believed that to abolish the Air Ministry, to re-absorb the Air Service into the Army and Navy, would be a fatally retrograde step. Even if it removed a little friction and facilitated the co-operation between the Air Service and purely Naval and Military operations, which is very doubtful, it would unquestionably retard the development of the Air Services in their own element in which it may be that the future of national defence lies. To take this step would be to bring back also all the evils of divided control. What is now required is that the three Services should regard themselves as the common servants of the nation in endeavouring to attain a single object. This cannot be achieved so long as the existence of the Air Ministry and the Air Force remains in doubt and the Government thought it right and fair to that Service, and no less fair to the other two Services, that they should define their attitude in this matter so that all may know what is expected of them and what system they would have to follow.'

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(v) Mr. Churchill's efforts to settle the Navy/Air Force controversy

Immediately after this pronouncement in Parliament it was arranged with the approval of the First Lord of the Admiralty and the Secretary of State for Air that, before the Subcommittee of the Committee of Imperial Defence was convened, an attempt should be made by Mr. Winston Churchill (Secretary of State for the Colonies) to arrive at an arrangement agreeable to both Services by bringing the First Sea Lord and the C.A.S. together in informal discussion. This was initiated by Mr. Churchill who sent a memorandum on the subject to the two contestants on 17 March 1922 of which the following is a precis:-

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- (1) The study and direction of a supreme sea battle belongs in its integrity to the Admiralty.
- (2) It follows that the role of aircraft in the sea battle must be prescribed by the Admiralty.
- (3) It follows also that the Admiralty should prescribe the quantity of aircraft employed and the proportional naval expenditure on aircraft for battle purposes.
- (4) From this it follows that the Admiralty should ask Parliament for the money and have full and unfettered control over the said aircraft while employed for naval purposes.
- (5) On the other hand, the Air Ministry was the repository of the science of aviation in all its branches and was the supreme professional authority on aerial war as a whole.
- (6) The relations of the Air Ministry to the Admiralty in respect of purely naval services should be of the nature of a laboratory and shop for material, and a school and staff college for personnel.
- (7) The general unity of the Air Service should be preserved even in regard to airmen of naval origin serving under the Admiralty and for this purpose there should be an interchange of personnel between

ibid  
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the Royal Navy and the Royal Air Force, and every effort should be made to prevent crystallisation into opposite and rival schools.

- (8) The Royal Air Force should be regarded as the parent service for all airmen in their capacity as airmen.

In his reply, the First Sea Lord (Lord Beatty) said the Admiralty had no desire to interfere with the Independent Air Force whose co-operation with the Royal Navy was entirely a separate question. What he demanded was a naval air arm for the Fleet which at present was supplied by another Service over which the Admiralty had no control. The air unit for the Fleet was similar in all respects to either the capital ship unit, the light cruiser unit or the destroyer unit. As a naval unit it must be manned, trained and controlled by the Navy for the Navy.

ibid  
page 264.

In the Air Ministry both Mr. Churchill's memorandum and Lord Beatty's reply were circulated to Air Staff branches and produced several reasoned answers for the consideration of the C.A.S. A reply was made to Mr. Churchill on 22 March by the C.A.S. in which he maintained that the Admiralty demand amounted to the thin edge of the wedge towards a separate Naval Air Service. Even though the central Air Force was now formed, it was still immature and it was too early to think of moving in the direction of detaching the small branches specially trained for work with the Navy and Army. However, he was prepared, if the Navy would not attempt to push their claims for more control over the Air Service than those outlined below, to adopt the final solution foreshadowed in his 1919 White Paper but he asked in return for real goodwill from the Admiralty and he promised, on behalf of the Air Force, to do his level best to understand the Admiralty's anxiety in this matter and to give them all the responsibility he possibly could. The system he was prepared to agree to was as under:-

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1. The Admiralty to ask for what they required for their Fleet and the Air Ministry would provide it.
2. The Admiralty to pay to the Air Ministry a grant-in-aid to cover the expenditure.
3. The Air Ministry to keep all units up to strength in personnel and material, and all personnel should remain with the Navy for a period of three years. In return the Navy must offer every facility to Naval officers to become airmen and encourage a few to go for general service in the Air Force to gain wide air experience.
4. The training of the personnel prior to their allocation to the Fleet, to be an Air Ministry responsibility.
5. All personnel, both of Naval and Air Force origin, should remain and be paid as airmen but should be at all times in all respects under the absolute orders of the Admiralty to do all that was required as airmen.

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6. All personnel when ashore to be accommodated at Air Force stations which would be administered and paid for by the Air Ministry but would remain under Naval control for all practices and exercises designed to maintain their efficiency for Fleet work.
7. A senior Air Force officer, with a small staff of permanent Air Force officers, to be on the staffs of all Admirals commanding independent Fleets.

Arising out of personal discussions on certain of these points with Mr. Churchill, the C.A.S. added three further clauses after a final meeting with him on 4 May:-

8. The Admiralty, as in supreme command of all Fleets and naval operations, to keep in the closest touch with the R.A.F. Coastal Area and to enable such close touch it was desirable that the Coastal Area Headquarters should be housed in the Admiralty or close by.
9. The Admiralty to be responsible for the number of units required for embarkation with the Navy afloat and for the payment for the same, and to be responsible for all air work by these units both when embarked and while at shore stations when the work is for the Navy afloat.
10. The Air Ministry to be responsible for all air operations from shore bases, not only in their independent capacity in carrying out the air defence of Great Britain and other work allotted to them, but also for those aerial operations carried out in co-operation with the Navy to assist the Fleet in operations afloat.

This comprehensive offer has been given in detail in order to show the utmost that the Air Ministry was prepared to go in satisfaction of Admiralty requirements for Fleet air work while still preserving the integrity of the Air Force. The document was sent to Lord Beatty by Mr. Churchill at the beginning of July and a conference on it was held at the House of Commons on 10 July 1922 at which were present Mr. Winston Churchill, Lord Beatty, Sir Hugh Trenchard with Sir John Chancellor as secretary. Lord Beatty opened by still insisting that, as the Admiralty were responsible for the fighting efficiency of the Fleet, they could not discharge their duty so long as they had not absolute control over a service which now formed an integral part of the fighting force of the Fleet and was essential to the efficient conduct of a naval action. Mr. Churchill pointed out that this was in fact a demand for a separate air service which in view of the recent Cabinet pronouncement he could not discuss. His object now was to bring together the divergent views of the Admiralty and Air Ministry on the subject of co-operation. Sir Hugh Trenchard asked what precisely was wrong with the existing system when adjusted by his tabled proposals. There was no friction between the junior officers of the Navy and Air Service but he feared that if a Naval Air Service were re-created it would stagnate with no senior Air Force officers available. The great advantage of the Unified Air Service was that it permitted the use of bomber and fighter squadrons indifferently for Air Force, Naval or Military duties as exigencies demanded. Lord Beatty avoided any direct answer

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to these remarks and reverted to the disagreement about the provision of officer personnel and Mr. Churchill finally directed that each side should prepare a report on how their differing schemes would work out in practice showing the respective expenditure and career futures of the personnel concerned. He would then convene a further meeting.

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encls. 14-16

During the ensuing weeks of July and early August tempers rose and several strongly worded letters were sent to Mr. Churchill by each of the opposing factions in which the Admiralty continued to demand complete control of the Fleet air units and the Air Ministry continued to oppose on the grounds that this would constitute a separate Air Force. The matter passed out of informal discussion by the circulation of a Paper by the Admiralty to the Committee of Imperial Defence on 22 July containing the following:-

C.I.D. 357B  
A.H.B.  
IHK/54/10/10  
and  
IB/3/8

'There is no desire on the part of the Admiralty either to abolish the Air Ministry or to destroy the Royal Air Force. On the contrary, the Admiralty would regard such a step as retrograde and detrimental to their own, as well as to the national, interest ..... But the Air Arm of the Navy is a Naval Unit of the fighting fleet exactly similar to the Light Cruiser or Destroyer Arm. It is for use in the sea battle. The Naval Air Unit does not form a separate Naval Air Service. The unit is a naval unit, an arm of the Fleet, equipped by the Navy for the Navy. The Naval Air Unit will act with other units in the naval battle, it cannot be withdrawn from a modern fleet without destroying the composition of that fleet ..... The duties and activities of the Independent Air Force, which should be the Air Ministry's responsibility, are entirely separate from those of the Air Arm of the Navy. Air Forces are required to co-operate with the Navy in the control of sea communications and defence of bases, and not being definite naval air units are available for other air purposes if necessary. Such air forces might advantageously form a Naval Wing under the Air Ministry keeping in close touch with the Sea Service. The decisions of H.M. Government in regard to the function and responsibility of the Independent Air Force under the Air Ministry are clear and definite, and at the moment are not being called in question.'

C.I.D. 360B  
A.H.B./IB/3/8

A few days later, Mr. Winston Churchill (Secretary of State for the Colonies) drew up a memorandum summarising the system and intentions of the independent Air Force since its inception with regard to co-operation with the Army and the Navy. He deplored the continuous opposition and attempts to split off from the Air Force the arms working for the two older Services. He maintained that an organisation on the existing lines would be far more efficient, harmonious and economic than the divided and disjointed rivalries which would result from the alternative schemes put forward. All that was needed to make the present system a complete success was perseverance and a termination of the disturbing uncertainty of the last two years.

C.I.D. 362B  
A.H.B./IB/3/8

The Admiralty Paper was answered on 26 July by the Secretary of State for Air in which he refuted their contention that the aircraft working with the Fleet were a naval unit similar to the Light Cruiser or Destroyer arms. This and similar quibbles appeared to him to stem from an underlying fear by the Admiralty that they had not full control of

these air units but under the present system they did have complete disciplinary and operational control of all shipborne Air Force units. The letter included a memorandum by the C.A.S. in which he dealt in detail with all the Admiralty complaints and showed how their abstract principles and contentions were divorced from any concrete proofs that the existing system was in any way failing to give satisfaction.

The Secretary of State for Air followed up this answer by a direct appeal to the Cabinet drawing their attention to certain considerations to be pondered when they examined the demand of the Admiralty for a separate Naval Air Service for, he said, stripped of the camouflage of technical detail with which the argument was obscured, the Admiralty's demand was no more and no less. Firstly, the question should be examined broadly from a political and not from a professional point of view. Secondly, a correct solution of the air problem was of importance to the well-being of the Empire, whether in peace or war, and consequently there was need for avoiding a premature decision. Five laborious years had gone to the building up of the sound and symmetrical structure of the present Unified Air Force and it could not now be lightly pulled down in a day and re-formed as two or three different Services.

He went on to instance the occasions in February 1920 when the Admiralty repudiated any idea of opposing the autonomous nature of the Air Force, then in February 1922 clamoured for its abolition and now, less than six months later, their convictions had apparently undergone another reversal but he noted that in this most recent disavowal the Naval Staff let fall the remark that the function and responsibility of the Independent Air Force under the Air Ministry were not at the moment being called in question. It was impossible to resist the conclusion that their present proposals were but the thin edge of the wedge which, once inserted, would be driven in deeper and deeper to cause an ever widening fissure.

Continuing, he said, the Admiralty's claims in C.I.D. 357B were based on abstract statements of theoretical principle and had little practical value. The counter-claims and counter-arguments were a waste of time and effort. The Air Ministry were prepared to reaffirm their acceptance of the principle that the Naval Commander should have complete operational and disciplinary control of air units accompanying the Fleet and that no such unit would be withdrawn from the Fleet without the consent of the Admiralty, unless by the overriding authority of the Cabinet. The Air Ministry had not been able to give the Navy all the machines they would like but this applied equally to Army requirements and the R.A.F. requirements for Home Defence but the only bar to a fuller provision had been lack of funds. In so far as concerned aircraft to accompany the Fleet, the Navy had received the full tale of machines warranted by its existing carrier capacity and therefore has all the aircraft which it can at present profitably accommodate. Furthermore the Admiralty have not pointed out any tangible defects of the present system worthy of serious consideration.

Finally he urged that the existing system be further tried out for a period of at least two years observing that the five years repeatedly stated necessary to reconstruct the Postwar Air Force would not be completed until 1924. If the Admiralty will second to the Air Force a sufficient number of officers of appropriate rank, the R.A.F. will train them in flying and air organisation so that should the Government at

A.H.B./ID2/132  
Part II  
encl. No. 2

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some future date decide to reverse their recent policy decision, the Admiralty would then be in a far better position to undertake the administration of its own Naval Air Arm than they are today.

(vi) An increase in R.A.F strength approved for Home Defence

Arising out of the Cabinet endorsement of the Balfour Sub-Committee conclusions, the Standing Defence Sub-Committee had decided to institute a special enquiry into the dangers to which the United Kingdom was exposed from air attack. The report had been rendered in April 1922 to the effect that if the Government decided that the Continental air menace, as outlined in the attached Air Staff memorandum, demanded a greater state of preparedness than existed, steps should be taken to strengthen the Air Force at home.<sup>(1)</sup> After consideration during May by the Standing Defence Sub-Committee, the chairman (Lord Balfour) submitted a Note (C.I.D.108A) to the Prime Minister with a view of obtaining a policy decision by the Cabinet or a full meeting of the Committee of Imperial Defence with the Prime Minister in the Chair.

After consideration of various papers and statements on the subject<sup>(2)</sup> the Committee of Imperial Defence agreed to the proposals for an increase in the Home Defence Force. These received Cabinet approval and were announced by the Prime Minister in the House of Commons on 3 August 1922 as under: -

1. An addition should be made to the R.A.F. for Home Defence of 20 new squadrons (500 aircraft) at an increased cost of £2 million per annum.
2. The Air Ministry were empowered to place orders at once with private firms for a certain number of aeroplanes the bulk of which would be delivered the next year.
3. The foregoing decision would not prejudice a further expansion of the R.A.F. if later on this was found necessary to our national security. This question would be considered in the light of the financial situation next year and of the air policy adopted by other Powers.

At the same time it was announced that the enquiry into the system of Naval and Air co-operation had not yet been completed.

(vii) The Navy/Air Force controversy comes to a head

Not only was the enquiry not completed but no further progress at all was being made by the informal discussions with Mr. Winston Churchill. The impasse remained unaltered until the resignation of Mr. Lloyd George's Government in October 1922 brought further hopes of a settlement to an end and the Imperial Defence Sub-Committee on the subject was

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(1) This was C.I.D.106A  
(2) These were C.I.D.107A and 109A to 115A. All are contained in A.H.B./IB/2/3.

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never convened.(1) However, the controversy continued in the form of propaganda issued by both contestants and much lobbying in Parliamentary circles.

C.A.S.  
Personal Papers

The matter came to a head on 20 February 1923 when the Prime Minister sent for Lord Beatty and pressed for a postponement of the issue until the recent Air Force expansion scheme was more fully under way but the First Sea Lord was not to be moved in his determination to force the issue to a point. A compromise was suggested by the new First Lord of the Admiralty (Mr. L. S. Amery) that in order to preserve the outward integrity of the Air Force the naval units, manned by naval personnel and a sprinkling of Air Force officers, should be shown on both the Admiralty and Air Force Lists, and that the Admiralty should make a grant-in-aid to the Air Force Estimates for the naval personnel. These latter would be entirely under the Admiralty for pay, promotion and everything else but would receive their initial training with the R.A.F. But both the Secretary of State for Air and the C.A.S. (Sir Hugh Trenchard) took the view that there was no chance of peace upon these terms.

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On 22 February, Lord Beatty saw Sir Samuel Hoare and said that when he first took up his appointment he had been asked by Sir Hugh Trenchard not to press the issue for the Naval Air Units as in a short time the Air Force would be strong enough to stand by itself without the Naval Units. Year after year he had been put off and now with the Air Force expansion scheme in train he could wait no longer and insisted on the issue being joined at once. Sir Samuel told him if that was his view the only course to be taken was to refer the case to an impartial enquiry.

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encl. 17

Later on the same day the First Lord and Secretary of State for Air saw the Prime Minister and agreed to abide by the findings of a Committee to be appointed without delay into the whole question of National Defence. This Committee to be either a Cabinet Committee or one composed of two or three accepted authorities such as Lord Balfour, Lord Weir and Lord Esher. Pending the report, the naval personnel already allocated by the Admiralty for the separate Naval Air Arm should be attached to the Air Force for discipline and training. Should the decision go in favour of the Navy, they would continue as Naval Airmen in the Naval Air Arm. Finally it was agreed that in the interim period during which the Committee was sitting there should be a truce on both sides in the matter of propaganda.

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(1) Mr. A. Bonar Law replaced Mr. Lloyd George as Prime Minister and on 2 November 1922, Sir Samuel Hoare was appointed Secretary of State for Air in place of Captain F. E. Guest.

(viii) The Salisbury Main Committee on National Defence

Accordingly on 9 March 1923 the Prime Minister directed that a Sub-Committee of the Committee of Imperial Defence(1) should meet to enquire into the co-operation and correlation between the Navy, Army and Air Force from the point of view of National and Imperial Defence generally, including the question of establishing some co-ordinating authority, whether by a Ministry of Defence or otherwise, and, in particular, to deal with:-

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ID2/68(A)  
page iv

- (a) The relations of the Navy and Air Force as regards the control of Fleet air work.
- (b) The corresponding relations between the Army and Air Force.
- (c) The standard to be aimed at for defining the strength of the Air Force for purposes of Home and Imperial Defence.

ibid  
pages 31-33

At its first meeting, on 15 March, the Sub-Committee discussed their terms of reference and the general method of conducting the enquiry whose scope necessarily covered a vast field of investigation. Having taken note that the Admiralty did not dispute the existence of a separate Air Ministry, it was agreed that a special Sub-Committee should be appointed with Lord Balfour in the Chair, and Lord Peel and Lord Weir as members, to enquire into term of reference (a) - 'The relations of the Navy and Air Force as regards the control of Fleet air work' - on the understanding that their enquiries would have to be correlated to the main enquiry.

To avoid confusion the parent body is hereafter referred to as Lord Salisbury's Main Committee and any sub-committees appointed by them by their chairman's name e.g. Lord Balfour's Sub-Committee.

Although not strictly germane to the story of the Maritime Air Force, the conclusions of the Main Committee are of great interest. During the course of its meetings, which lasted up to the end of October,(2) it was found that some immediate recommendations were desirable for submission to the Cabinet. The earliest of these formed the subject of an Interim Report (N.D. 46 and 47 dated 12 June) in which was

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- (1) The composition of this Sub-Committee was:-  
Lord Salisbury (Chairman) - Lord President of the Council  
Mr. Stanley Baldwin - Chancellor of the Exchequer  
Lord Curzon - Secretary of State for Foreign Affairs  
The Duke of Devonshire - Secretary of State for the Colonies  
Lord Derby - Secretary of State for War  
Lord Peel - Secretary of State for India  
Mr. L. S. Amery, M.P. - First Lord of the Admiralty  
Sir Samuel Hoare - Secretary of State for Air  
Lord Balfour  
Lord Weir  
Sir Maurice Hankey - Secretary
  - (2) For those who wish to read the final complete Report, see A.H.B./ID2/68(A) pages 2 to 20. It was dated 15 November and was laid before the Cabinet as C.P.461(23). After thanking the Lord President of the Council and his colleagues for their prolonged labours on this Enquiry, the Prime Minister and Cabinet agreed on 16 November 1923 to approve it. Ref: Cabinet 56 (23) contained in A.H.B./IA/36/1 encl. 56. It was announced in both Houses of Parliament and published as Cmd.2029.

A.H.B.  
ID2/68(A)  
pages 14-16  
and  
IA/36/1  
encl. 32

urged a prompt increase in the R.A.F. for Home Defence to a strength adequate for protection against air attack by the strongest Air Force within striking distance of this country.(1) The Report received Cabinet approval on 20 June (Cabinet 32(23)) and on the same day it was announced in both Houses of Parliament that the Home Defence Air Force would be increased as soon as possible to 52 squadrons (17 fighter and 35 bomber) thus adding 34 new squadrons to the authorised strength of the Royal Air Force.(2)

A.H.B.  
ID2/68(A)  
pages 6-12  
and 18-20

ibid  
page 229

C.I.D.409B  
A.H.B.  
ID2/68(B)  
pages 193-197

The subject of co-ordination for the three Services received much attention and it was finally concluded that no form of Defence Ministry would be superior to the existing machinery under the Committee of Imperial Defence but the membership of this Committee should be enlarged to include the three Chiefs of Staff.(3) During the hearing of evidence, Sir Hugh Trenchard suggested the formation of a Chiefs of Staff Committee to advise the Committee and Cabinet on Defence problems so that a co-ordinated policy could be presented instead of each Service producing its own independent opinions. He also strongly advocated the early institution of a Joint Staff College. This latter project had been the subject of consideration since December 1922 by a special sub-committee under the chairmanship of Mr. E. F. L. Wood, M.P.(4) They made their report on 11 May 1923 and recommended the establishment of a Joint College, to be called the Imperial Defence College, which should be located in London. Students should be selected from graduates of the Staff Colleges and officers of the Dominion forces should be eligible for admission. Supervision should be exercised by the Committee of Imperial Defence who would lay down the policy to form the basis for the instruction given which aimed at producing a body of officers trained to look at the problems of war as a whole with a common doctrine in regard to defence policy. All the above recommendations were accepted by the Government and the decisions were presented to Parliament in August 1923 in Cmd. 1938.(5)

A.H.B.  
IIK/54/10/7  
encl. 1

Regarding the co-operation and correlation between the three Services from the point of view of National and Imperial Defence, the Main Committee, after long consideration of the

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- (1) Relevant Papers concerning this subject - N.D. 4, 6, 10, 11, 21, 24, 25, 27, 31, 32, 37, 39, 41, 42, 44, 46 and 47 - all of which are in A.H.B./ID2/68(B).
  - (2) The Air Forces of the Dominions were not included in the authorised figure. At this time there were in existence the South African Air Force (first formed 9 August 1920, the Royal Australian Air Force (first formed on 1 April 1921, and the Royal Canadian Air Force (first formed on 1 April 1922).
  - (3) Relevant Papers - N.D. 7 to 9, 13, 15, 28, 54 to 56, 59 and 66 (C.P.346 (23)) - all of which are in A.H.B./ID2/68(B)
  - (4) The other members were:- Rear-Admiral H. W. Richmond, Major-General C. F. Romer, Air Vice-Marshal Sir W. G. H. Salmond and Mr. E. W. H. Millar (Treasury).
  - (5) The Chiefs of Staff Committee was not officially instituted as a Standing Committee to the Imperial Defence Committee until May 1926 (C.I.D.685B), and the Imperial Defence College was not finally approved until June 1926. The first course opened in January 1927 (C.I.D.698B).

A.H.B.  
ID2/68(A)  
pages 6 and 18

ibid  
page 5

evidence submitted, put forward no suggestions to change in any way the principles enunciated in July 1921 by Mr. Balfour and adopted by the Government in the House of Commons pronouncement on 16 March 1922 but they did recommend further examination of an additional principle that where more than one Service was concerned in belligerent operations, one Service should be selected as the predominant partner. It is of interest that during the evidence given, the Naval Staff considered that in the early stages of a war with a Western European Power it would be necessary to divert north-about Scotland all the mercantile traffic bound to and from the East Coast until such time as co-operation by the Air Force could be relied on for the protection of convoys against enemy air and submarine attack. But the Naval Staff refused to accept the views of the Air Staff as to the probable enforced closing of the Western Mediterranean to British merchant shipping through enemy air action. The widest difference of opinion between the two Services showed itself on the question as to what degree the advent of air power would affect free naval and shipping movements in the narrow seas and the Committee recommended further investigation into this subject.(1)

The enquiry into the term of reference (b) - 'The corresponding relations between the Army and Air Force' - produced another series of War Office attacks on the existence of the separate Air Force in which, however, they were not supported by the Admiralty who were only concerned to get their own Naval Air Arm detached from the main body of the R.A.F. The Main Committee were quite unable to accept the views expressed by the General Staff but Lord Derby asked that his dissent from this conclusion might be recorded.(2) The Cabinet concurred with the finding on 9 July and confirmed the existing situation under which the Royal Air Force was administered by the Air Ministry as a separate Department of State.

C.I.D. 388B  
which became  
C.P. 22 (23)  
A.H.B./IB/3/8  
and  
ID2/68(B)  
page 141

One other matter among War Office claims deserves to be mentioned. An earlier War Office accusation of extravagant duplication by the separate Air Force in certain administrative sections had been under examination by a special sub-committee appointed by the Cabinet under the chairmanship of Lord Weir. The sections concerned were the Medical, Dental and Chaplain branches and the sub-committee found that no substantial economy could be secured by amalgamation under Army control whereas efficiency would definitely suffer under such a scheme. Their report was accepted by the Cabinet on 30 May 1923. (Cabinet 14 (23) (2)).

(ix) The Balfour Sub-Committee on the Fleet Air Arm

Before relating the proceedings and conclusions of this important Sub-Committee it would be as well to give a brief account of the R.A.F. Coastal Area and the system under which the units for Fleet work were provided, manned and trained. From now onwards such units became known as the Fleet Air Arm.

- (1) Relevant Papers - N.D. 5, 12, 16, 18 to 20, 26, 30, 35, 45 and 53 - all of which are in A.H.B./ID2/68(B).
- (2) Relevant Papers - N.D. 14, 23, 33, 34, 38, 40, 50 to 52, 57 (C.P. 292(23)), and 58 (C.P. 299(23)) - all of which are in A.H.B./ID2/68(B). In addition, two Papers were circulated direct to the Cabinet by the S. of S. for War. C.P. 296(23) against the continuance of a separate Air Service and C.P. 294(23) criticising the Air Staff scheme for Home Defence. Both were refuted by the S. of S. for Air in C.P. 310(23) dated 5 July. Ref: A.H.B. IA/1/3.

(A) The Coastal Area organisation in April 1923

(a) The relationship with the Navy

1. The Air Officer Commanding Coastal Area was adviser in the first place to the Admiralty on air matters (the C.A.S. was chief adviser to the Admiralty).
2. The Senior Air Staff Officer (S.A.S.O.) of Coastal Area was always in close touch with the head of the Admiralty Naval Air Division.
3. The C.-in-C. Atlantic Fleet had an R.A.F. officer on his staff as air adviser.
4. The Captain of an aircraft carrier had a Wing Commander who acted as air adviser.
5. The Group Captains in command at No. 10 Group and the R.A.F. base at Leuchars had orders to keep in close touch with the various naval C.s-in-C., the Commanding Officers of H.M.S. Excellent (Naval Gunnery School), H.M.S. Vernon (Naval Torpedo School), the Naval Signal School and the Submarine Headquarters at Gosport. Exercises were continually being carried out in co-operation with these establishments.

(b) The supply of aircraft for the Fleet Air Arm was as follows:-

1. New design, experimental and research work were carried out by the Air Ministry but naval requirements were incorporated after consultation with Admiralty technicians.
2. The Air Ministry was solely responsible for the production of all the aircraft. The numbers required were agreed with the Admiralty and were maintained by the Air Ministry at full strength together with the correct proportions of machines in reserve, the necessary spare parts and the various shore establishments required for their maintenance. N.B. the strength was governed by the number of Carriers in commission and the Air Ministry had made arrangements in their programme to provide for an increase when the two new Carriers were complete in 1923/24.(1)
3. No. 10 Group and R.A.F. Leuchars were responsible to supply machines and personnel to the Carriers. If flying-off-turret machines were required, Leuchars did this as well.

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- (1) The strength and disposition of R.A.F. Coastal Area, including the Fleet Air Arm, is given for April 1923 in Appendix V. Starting from May, the 'Squadron' as a unit was replaced by the 'Flight' of six aircraft as it was usually only six machines of a type that were embarked on a Carrier. An expansion in the numbers of these Flights commenced in this month. The performance of aircraft types is given in Appendix VI.

A.H.B.  
ID2/96  
pages 342-344

ibid  
pages 338-340

4. An officer at A.H.Q. Coastal Area was detailed solely for technical duties in the Carriers and was a member of the Joint Technical Committee. Each Carrier had a permanent staff consisting of a Wing Commander and technical officers, and a certain number of other ranks, who remained permanently in the ship.
5. Flights of different types of machines were embarked as ordered by the C.-in-C. Atlantic Fleet.
6. Experience had shown that sufficient training could not be given in a Carrier to keep the flights at a proper pitch of efficiency and it was the custom to disembark them at least every six months for intensive training on an aerodrome. These units were never disembarked without the concurrence of the Senior Naval Officer.

(c) The supply of personnel was effected as under:-

1. The Air Ministry was responsible for the supply of officers and other ranks for duty with the Fleet Air Arm with the exception of certain naval officers employed as observers in 'spotting' machines and the naval W/T operators working with them. The existing numbers at home were 115 officers and 684 other ranks. Up to date there had been a certain number of R.A.F. officers with previous naval experience in the Fleet Air Arm but these numbers would diminish as time went on.
2. The supply of R.A.F. officers to meet future demands would contain a proportion of officers holding permanent commissions as well as those with short service commissions.
3. The Air Ministry had hoped that the system of 'seconding' naval officers to the R.A.F. would provide a large proportion of the Fleet Air Arm but this system was looked on with disfavour by the Admiralty and in consequence had proved a failure up to date.

ibid  
pages 340  
and 341

ibid  
pages 350-353

(d) Operational procedure

1. The A.O.C. Coastal Area dealt direct with the various Naval C.-in-C. on operational matters involving the embarking and disembarking of machines and personnel.
2. Orders for the aircraft actually embarked were given by the C.-in-C. of the Fleet or Squadron to which the Carrier was attached, assisted by his air adviser.
3. Orders for the aircraft when disembarked were given by the A.O.C. Coastal Area working in conjunction with the Naval C.-in-C. in accordance with the exercises required.
4. All reports on operations were forwarded direct by the R.A.F. officers concerned to the Naval C.-in-C. and a copy to the A.O.C. Coastal Area.

5. After operations a conference usually took place aboard the fleet or squadron flagship, attended by the R.A.F. officers concerned.
6. If bombing experiments were required, application was made by the A.O.C. Coastal Area to the Air Ministry as no bombing units existed in the Coastal Area Command.
7. Air units when embarked on board H.M. Ships or Carriers automatically came under the Naval Discipline Act.
8. Air units when disembarked came under the orders of the A.O.C. Coastal Area but the Naval personnel did not come under the Air Force Discipline Act.
9. All requests from the Navy for Aerial Operations were received by the Group Captains at No. 10 Group and Leuchars who instructed the unit concerned to provide aircraft and issued general air instructions for the operation required together with any instructions he might receive from the Navy bearing on the particular operation. In the case of a major operation, the H.Q. Coastal Area was informed.

A.H.B.  
IHK/54/10/10  
Pack No. 2

ibid

During the year 1922 aerial operations included the following:- Long Distance Reconnaissance, Torpedo attacks(1) on the fleet and on single ships, Dusk Torpedo attacks, Bomb dropping on H.M.S. Agamemnon, Machine gun firing at H.M.S. Agamemnon, spotting fall of shot for H.M. Ships, Lookout exercises with the Fleet, W/T exercises, Visual Signal exercises, Inclination exercises with the Fleet, General Photographic work for the Fleet, Smoke Screen exercises, and Observing of Submarines.

(e) Training of Personnel

The following essentials were carried out at other R.A.F. establishments and not done in the Coastal Area schools:- Initial and preliminary flying training up to the handling of the Service type machines except seaplanes; Aerial Gunnery and Bombing instruction; Photographic instruction; and the training of other ranks in their various trades before being drafted into the Coastal Area.

Annual Training in the Coastal Area in the following subjects:-

1. Signals and W/T with special reference to naval procedure and requirements.
2. Aerial Reconnaissance, including Fleet formations, tactics and ship recognition.
3. Fleet Spotting, including Range and Bearing finding, and concentration of Fire signals and procedure.
4. Air Navigation and Pilotage including Compasses, Charts, and Maps.

ibid

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(1) See Appendix X.

5. Seamanship, Naval Routine and Etiquette.

The above syllabus was taught during two periods, each of two months, each year and in addition complete courses of Ground and Aerial Gunnery were carried out by all officers annually.

Special Courses for officers requiring higher training in Fleet work

Marine Observers - Six months course at Lee-on-Solent which comprised all the subjects enumerated under Annual Training but at a much higher standard and with the additional subjects of convoy and anti-submarine work together with practical work carried out with the Fleet. Pupils on this course were also required to pass through a two months course of Aerial Gunnery and Bombing at Eastchurch and then to complete six months practical work in a Service Squadron before being granted a specialist qualification. The Naval Officer Observers also went through this course except for the Eastchurch portion.

ibid

Air Pilotage - A three months course at Calshot had recently been substituted for the special years course in Aerial Navigation which had by now supplied a sufficiency of highly trained Navigators. The Air Pilotage course was considered adequate to enable Pilots to navigate out of sight of land. It included the subjects of instruments, compasses, meteorology, charts, D.R. navigation, mathematics and trigonometry together with practical air work.

Seaplane Training - Three months course at Calshot to candidates who had already qualified in the air as pilots of land machines. This course was to maintain the supply of pilots for seaplanes, amphibians and flying boats.

Torpedo Work - Six months course at Gosport which was for pilots of Torpedo Flights. In addition to a working knowledge of the weapon itself, pupils were taught the strategy and tactics employed by the torpedo squadrons. Selected pupils were sent on for further instruction in stripping, assembling and running torpedoes at the Naval Torpedo School in H.M.S. Vernon. In addition to officers, a number of fitters were trained in torpedo fitting.

ibid

Photography - Selected officers were sent periodically to the R.A.F. School of Photography for both short and long courses and all Observers were required to attain the standard for Fleet work.

Wireless Operators - Subsequent to their initial training, all wireless operators were trained in Naval Procedure with their service squadrons and naval W/T operators were trained in air work.

Deck Landing - All pilots destined for embarkation in Carriers were trained in Deck Landing which was first carried out on marked-out decks on the aerodrome and then in actual practice on H.M.S. Argus.

(B) The proceedings of the Sub-Committee

The details of the R.A.F. Coastal Area organisation have been given rather fully in order to show to what degree the Air Ministry had gone in making every possible effort to provide an efficient Fleet Air Arm. Basically the Admiralty complaint was insistence on the historic principle that, as the sole responsibility for Fleet efficiency was vested by Letters Patent in the Lords Commissioners, the Board must have complete control over all arms contributing to this efficiency. As these now included the relatively new Air Arm nothing less than a clean cut from the R.A.F. to the Navy would satisfy them. It followed that they were not interested in making the existing or any other system workable and this explains much of their inconsistent and sometimes nebulous criticism that, although they could point to no serious failure on the part of the R.A.F., they could themselves do the job better. On the other hand, the case for the Air Ministry was equally fervid insistence on the more recent principle of a single and undivided Air Service which could satisfy the closest co-operation demands from the Navy while still preserving its integrity.

The Balfour Sub-Committee held its first meeting on 20 March 1923 and decided to circulate the Papers containing the more recent opinions at issue on the relations between the two Services(1) and then to call for oral evidence from the First Sea Lord, the Chief of the Air Staff and the respective officers concerned with actual experience in the existing conditions. In addition and from time to time a number of memoranda were submitted by both sides in which their arguments were stated and refutations of their opponents expanded in greater detail than could be done in oral conditions.(2)

Oral evidence started at the second meeting on 22 March and was from the First Sea Lord (Lord Beatty) in favour of the creation of a separate Naval Air Arm to undertake all naval air work. He contended that the existing situation whereby an essentially naval task was entrusted to another Service was not only illogical and difficult to implement without constant friction but was extravagantly expensive in the amount of duplication and overlapping of personnel and establishments which it entailed. Sir Hugh Trenchard (C.A.S.) followed with evidence denying these statements and ended by stressing the fact that a separate Naval Air Arm would ultimately require a completely separate ground organisation thus far outstripping in cost any small overlapping which was now possibly occurring. Having heard the opinions of the Assistant Chief of the Naval Staff, which were in support of a separate Naval Air Arm, and the A.O.C. Coastal Area on the details of the existing system, the Sub-Committee then heard evidence from the Air Member for Supply and Research.(3) This laid bare the true extent of the

(1) These Papers were:-

- C.I.D.357B - Memo by the First Lord - 22/7/22
  - C.I.D.360B - Memo by S. of S. for the Colonies - 25/7/22
  - C.L.D.362B - Memo by S. of S. for Air - 27/7/22
- and the Summary of discussions between Mr. Churchill, Lord Beatty and Sir Hugh Trenchard. All are mentioned in Section (v).

(2) These memoranda were numbered N.D.(R)2 up to N.D.(R)19 and are contained in A.H.B./ID2/96 under the heading of Memoranda.

(3) This was Air Vice-Marshal Sir W. G. H. Salmond.

A.H.B./ID2/96  
page 10

ibid  
pages 12-33

ibid  
pages 33-62

ibid  
pages 120-139

extra cost involved in any major change as it became clear that if a wholly Naval Air Arm was permitted it would inevitably result not only in the duplication of operational organisation but in completely separate Supply and Research Departments stemming from the axiom that the user must be under the same control as the producer, particularly in the case of aircraft where the user's life was at stake.

Then followed a number of high ranking naval Commanders<sup>(1)</sup> who put in very telling arguments from their own experience on the impossibility of naval air tasks ever being accomplished by a branch of the R.A.F. with the same efficiency as would obtain with purely naval personnel in a Naval Air Arm.

ibid  
pages 200-208

Curiously enough the hottest opposition to any change came from Rear-Admiral Murray Sueter, M.P. who was speaking on behalf of the Parliamentary Air Committee. His evidence carried weight as it was he who had started the Naval Air Service in 1912 and had remained with it until the end of the war. He drew attention to the inefficient and obstructive nature of Admiralty Air Administration before and during the war resulting, in spite of frequent suggestions, in the absence of any rigid airship for sea reconnaissance comparable to the German Zeppelin, the lack of any efficient aircraft carriers, the failure to develop the torpedo plane and the blocking of the early development of the big Handley Page aircraft. It would be, he said, a retrograde step to give the Admiralty any control whatever over the Air Services.

ibid  
pages 208-255

The case for the Admiralty was summed up on 18 June by Lord Beatty and for the Air Ministry by Sir Hugh Trenchard on 3 July in which each cross-examined somewhat forcibly certain statements made during the course of previous evidence. On 13 July, Lord Peel and Lord Weir visited the Coastal Area training establishments in the Gosport area and the aircraft carriers Argus and Eagle at Portsmouth in order to see and hear for themselves the relations between the two Services at the operational and training level.

(C) Conclusions and recommendations by the Sub-Committee

After final meetings amongst themselves on the 15th<sup>(2)</sup> and 20 July the Sub-Committee issued their Report (N.D.60) on 21 July 1923.

ibid  
pages 3-5

Part I summarised the courses of action advocated by the contending sides and the Sub-Committee stated that, although the present system could not remain altogether unchanged, they did not think it possible to sever completely the Air organisation which did work for the Fleet from the Air organisation which was responsible for Home Defence against air attack and for co-operating with the Army in other operational theatres. A course somewhere between the two extremes was the one which they recommended.

- (1) Notably Admiral Sir John de Robeck and Vice-Admiral Sir Richard Phillimore. Ref: A.H.B. ID2/96 pages 176-197.
- (2) Lord Balfour had for some time been ill and this meeting took place in his room at the Grand Hotel, Sheringham where he was convalescing.

Part II described the existing system in general terms and Part III itemised the Sub-Committee's recommendations for its improvement which briefly were as follows:-

1. That it should be the settled practice of the Air Ministry to consult with the Admiralty before appointments were made to the positions of Air Officer Commanding the Coastal Area, the Group Captains in contact with the Navy and the Senior Air Officer on board a Carrier.
2. That in the event of the Air Ministry for one reason or another not carrying into effect the wishes of the Admiralty regarding the material demanded, there should be an appeal by either party to the Committee of Imperial Defence.
3. That the two Departments should in collaboration draw up a code of regulations which would make clear the relations regarding discipline at all points where they came in contact.
4. That the question of which Department's Estimates should include the cost of the Fleet Air Arm should be settled by the Treasury in consultation with the two Services.
5. That on board ship when under the Naval Discipline Act the position of a member of the Air Force did not differ in law, and should not differ in practice, from the position of, say, a Marine.
6. That the Air Ministry should accept the principle that all reports on officers of the Fleet Air Arm should be signed by the Captain of the ship and passed through the Naval C.-in-C. to the A.O.C. Coastal Area.
7. That it be definitely laid down that the personnel, material and reserves of the Fleet Air Arm should not be withdrawn by the Air Ministry without either the consent of the Admiralty or a decision of the Cabinet.
8. That the subject of duplication of effort between the purely Naval Service and the Air Service should be looked into by the two Departments and measures taken to avoid all overlapping.
9. As in time of war the two Services may have to co-operate as a whole, it was vital that in times of peace they should form an accurate estimate of each others needs and capacities, therefore it was recommended that:-

(i) Naval Officers should be appointed to the Air Staff.

(ii) Air Officers should be appointed to the Naval War Staff.

(iii) Some means should be devised to utilise the wealth of technical knowledge at the disposal of the Admiralty in the technical departments of the Air Ministry.

ibid

10. It was even more important that the junior ranks of the two Services should have a considerable sprinkling of persons familiar with the needs and capacities of the other Service. The Air Force look to the system of naval seconding for carrying out half of this policy. Unfortunately seconding from the Navy to the Air Force had been a failure but it must be pointed out that there has been a misunderstanding of the liabilities attached. The duties of the seconded officer, though carried out in the air, remained nevertheless Naval duties, and the Captain whom he has to obey continued to be a Naval Captain. In order to make the situation clear it was recommended that no seconded Naval officer should be asked to perform non-naval air duties, except with the consent of the Admiralty.

11. It was further recommended that the uniform of a Naval flying man should be distinguished from the flying men under the Air Force by some differentiating badge.

ibid

12. If the secondment scheme succeeded, it might well be that the numbers would exceed the 30 per cent contemplated by the Air Ministry. The Sub-Committee saw no reason why 30 per cent should be regarded as the maximum and it was proposed to leave it to the Admiralty to determine what the proportion should be, subject to the proviso that not less than 30 per cent of Air Force officers should serve on board the Carriers.

13. That Observers for Fleet Reconnaissance, as well as for Spotting, should be Naval Officers seconded or otherwise.

(D) Endorsement by the Salisbury Main Committee

A.H.B.  
ID2/68(B)  
pages 321 and  
322

On 25 July, the Admiralty sent a Paper (N.D.63) to the Main Committee in which they disagreed with the findings of the Balfour Sub-Committee. They maintained that the major principle of complete Admiralty responsibility for all arms involved in the fighting efficiency of the Fleet had been confused by the Sub-Committee with a different and far less important principle which the Air Ministry was advancing, viz., that the Air Service should not be 'dismembered' by the removal of an arm less than 5 per cent of the total Air Force of today and a much smaller percentage of the Air Force in contemplation. Apart from this main question the Admiralty disagreed entirely with the secondment proposals and continued to request definite and undivided control over the personnel of the Fleet Air Arm and of its training. A similar Paper (N.D.64), but going into more detail, was issued by the First Lord in which he claimed the only solution was to make a clean out in favour of the Navy.

ibid  
pages 323 and  
324

A.H.B.  
ID2/68(A)  
pages 243-249

The whole matter now came before Lord Salisbury's Main Committee. At its 18th meeting on 26 July the argument was developed in full by the First Lord, the Secretary of State for Air, Lord Weir and Lord Peel. A majority agreement was reached by the Committee supporting the Report with dissent by Mr. Amery and Lord Derby. On the following day at a further meeting of the Main Committee a clause was inserted to

ibid  
pages 251-253

the effect that Naval officers attached or seconded to the Fleet Air Arm should retain their naval uniform with the addition of a special badge denoting the Air Branch. The Main Committee then agreed to recommend the Cabinet to adopt the Report of the Balfour Sub-Committee and recorded the dissent of the First Lord and the Secretary of State for War.

N.D.67  
(also C.P.363  
(23))

Lord Salisbury wrote a memorandum on 30 July which summarised the reasoning both of his own and the Balfour Sub-Committee. He made the point that the shore-based air forces and the shipborne air force might well be called upon to act together. Such common action might be very difficult without unity of method in the two air forces. If a line between them was to be drawn, where should it lie? Were the shore-based aircraft which patrol the coast and co-operate with the Navy to belong also to the Navy or were they to belong to the general Air Service? it was clear that all had the closest relations with both the sea and the shore, and illustrated the necessity for a Single Air Service. Economy pointed in the same direction and the conclusion against the duplication of training schools, aerodromes and building plant was evident. The Single Air Service was the recommendation he submitted to the Cabinet but it was necessary to add that no solution would work, whether as contended for by the Admiralty or by the Air Ministry, except by the goodwill and public spirit of the Services concerned. Whatever might be the decision of the Government or of Parliament, they had a right to expect a full measure of that goodwill and public spirit from all ranks in the armed forces of the Crown.

A.H.B.  
ID2/68(A)  
pages 231  
and 332

ibid  
page 13 and  
IHK/54/10/7  
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The Sub-Committee's conclusions and recommendations together with the remarks thereon by Lord Salisbury's Main Committee were accepted and adopted by the Government who presented them to Parliament in August 1923 (Cmd. 1938).

CHAPTER V

NAVY/AIR CONTROVERSY - 1923 to 1928

(i) Disagreement over the implementing of Balfour Sub-Committee Recommendations

It might be thought that here at last was a decisive end to the controversy over the continued existence of the separate independent Air Force and to the question of how the shipborne Fleet Air Arm was to be supplied, manned and trained. But it was not to be so.

A.H.B.  
ID1/97  
encl. 1

On 12 October 1923 the Air Ministry forwarded to the Admiralty their proposals for implementing the thirteen recommendations made by the Balfour Sub-Committee towards the regulation and satisfaction of conditions governing the control of the Fleet Air Arm. The Admiralty reply, dated 13 November, stated that although every effort would be made to make the scheme work, it was regarded by them as a trial of an experimental nature. There followed a long detailed examination of each of the recommendations with the Admiralty's ideas as to how they should be implemented. While in some cases these were acceptable to the Air Ministry, in others they went far beyond and differed fundamentally from the Air Ministry's proposals.

ibid  
encls. 2  
and 3

In dismay the Air Ministry replied on 11 January 1924 that the tenor of these was so inconsistent with the obvious intentions of the Command Paper 1938, amounting in fact to the almost complete segregation of Naval air units from the rest of the R.A.F., that if they represented the Board's final considered view the Air Council could only suggest that the interpretation should be referred for decision to the Committee of Imperial Defence. This was followed by a memorandum by Sir Samuel Hoare to the Committee in which he summarised the points of difference in interpretation with an appendix analysing the two sets of proposals. The main disagreements came under the heading of personnel and the Air Ministry refused to accept the following Admiralty proposals:-

ibid  
encl. 4

ibid  
encl. 5

1. That all designs for F.A.A. aircraft should be examined by Admiralty technicians (observing that the Admiralty had no competent technicians of this nature).
2. That all W/T apparatus for F.A.A. aircraft should be designed exclusively by the Navy.
3. That the R.A.F. shore station commander should be responsible to the Naval commanding officer of the Carrier for the conduct of training disembarked air crews.
4. That the whole of the 'other rank' personnel for air duties on board Carriers should be naval and were not to be attached to the Air Force.
5. That the permissible 70 per cent Naval officer complement of the F.A.A. should be calculated from the combined total of shipborne and shore establishment posts. This would require the large increase of 150 naval officers to receive flying training during 1924.

6. That Naval Observers should be given a short course in flying and receive higher pay than pilots.

Shortly after the circulation of this memorandum the Conservative Government fell and a Labour administration took office on 23 January with Mr. Ramsay MacDonald as Prime Minister. Lord Thompson was appointed Secretary of State for Air in place of Sir Samuel Hoare and Lord Chelmsford became First Lord of the Admiralty instead of Mr. L. S. Amery. The new Departmental Ministers immediately took up contesting positions in the controversy. Among other piecemeal items which he took in isolation from their context, Lord Chelmsford fastened on a statement in Part II of the Balfour Report in which the R.A.F. Coastal Area was described as the 'organisation provided by the Air Ministry for the purpose of administering the Fleet Air Arm on land, subject to the general control of the Air Ministry'. This, the First Lord asserted in a letter dated 14 February, showed that the Fleet Air Arm was not confined to carrier borne units and must include the Coastal Area shore establishments and training schools. The Chief of the Air Staff penned some strong comments on this letter and observed that there was no evidence that Lord Chelmsford had even read the Air Ministry's memorandum and the Admiralty's attitude seemed to be that the appointment of a new First Lord meant that the whole question of the relations between the Navy and the Air Force could now be considered de novo.

On 27 February, Lord Thompson replied officially that the Admiralty's proposals seemed quite at variance with the intentions of the authors of the Balfour Report and there was little hope of settling the differences by personal correspondence. There was nothing for it but a reference to an impartial authority and to him the most suitable was the three authors of the Report, Lords Balfour, Peel and Weir. The First Lord agreed to this solution and both Ministers wrote early in March to the Cabinet asking for the appointment of a special Committee to interpret the recommendations.

(ii) The Haldane Enquiry results in the Trenchard/Keyes Agreement

At a meeting of the Cabinet held on 12 March 1924 the Lord Chancellor (Lord Haldane) was requested, as Chairman of the Committee of Imperial Defence, to enquire into the interpretation of any doubtful points in the Report of the Balfour Sub-Committee on the relations between the Navy and the Air Force.

Lord Haldane opened the enquiry on 20 March with a preliminary discussion on some of the points at issue with the C.A.S. (Sir Hugh Trenchard) and the D.C.N.S. (Vice-Admiral Sir Roger Keyes). This was continued on the 25th and the C.A.S. found himself in the invidious position of defence against what he regarded as new and unwarrantable claims by the Admiralty instead of a discussion on the application of clearly stated recommendations in the Balfour Committee Report. In a letter to Lord Haldane on the 26th he said he got the impression that the whole discussion was being conducted on the supposition that the Admiralty's interpretations of the Balfour recommendations were correct - a point of view which he keenly contested.

ibid  
encl. 8

ibid

ibid  
encl. 10

ibid  
encls. 11  
and 12

Cabinet 19(24)  
Conclusion 4  
A.H.B.  
ID2/97 encl. 19

C.A.S.  
Personal Papers

ibid

On 28 March an informal meeting took place with Lord Haldane in the Chair at which were present the two chief contestants and members of their staffs. Discussion ranged round the two main Admiralty claims, firstly, that the R.A.F. Coastal Area should be regarded as Fleet Air Arm for the purpose of deciding the 70 per cent figure for naval officer attachment with the consequent large increase in the number to be trained, and secondly, that all 'other ranks' on board the Carriers should be naval personnel. After considerable argument it was agreed that these subjects together with other questions on personnel should be decided by a series of direct negotiations between Trenchard and Keyes.

ibid

Accordingly these two men, who it is not often remembered were related by ties of marriage, got down to a protracted hammering out of differences upon each one of the Balfour recommendations. Throughout April, May and June this continued and culminated on 4 July 1924 in a joint letter to Lord Haldane enclosing the agreements reached on behalf of the Air Ministry and Admiralty.<sup>(1)</sup> The only recommendation on which they failed to agree was the one concerning the incidence of cost of the Fleet Air Arm as between the two Departments and that they had referred to the Treasury for decision.<sup>(2)</sup> In their covering letter they said they both recognised that, in trying out the scheme, amendments would no doubt from time to time be required in the light of practical experience, but they hoped that the main principles would provide a lasting and satisfactory settlement of the questions which had been so long at issue between the Admiralty and Air Ministry. Lord Haldane replied that the Agreement seemed excellent and he accepted it adding 'this piece of work on your part is an example of what skill, combined with forbearance, can effect'.

C.P. 394(24)  
A.H.B.  
ID2/97 encl.19  
Cabinet 41(24)  
Conclusion 5

Lord Haldane informed the Cabinet on 11 July of the successful conclusion of his enquiry, paid tribute to the two men responsible, and submitted the detailed Agreement. This was approved by the Cabinet on 15 July who directed its inclusion in the archives of the Committee of Imperial Defence.

A.H.B.  
IB/3/11

The Trenchard/Keyes Agreement was circulated as C.I.D. 503B and is a voluminous document. It is only necessary here to give short summaries of the agreements achieved on the points at issue as listed in section (i):-

1. Design of aircraft

The Admiralty would list the numbers of aircraft required together with the performances desired. The Air Ministry would then prepare detailed

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- (1) A full record of all letters and discussions during the three months is contained in a folder 'The Trenchard-Keyes Agreement' among the C.A.S. Personal Papers.
  - (2) This matter was settled by a conference held at the Treasury on 30 October 1924. The Treasury ruled that provision should in future years be made on Navy Estimates for a grant-in-aid of Air Votes in respect of the cost of the Fleet Air Arm. Both the Admiralty and Air Ministry accepted this decision.

Ref: A.H.B./ID2/97 encl. 20.

specifications incorporating these and any subsequent amendments by the Naval Staff. The Air Ministry would be responsible for constructing the aircraft.

2. W/T apparatus

Naval requirements for W/T, R/T, V/S etc. would be communicated to the Air Ministry by the Admiralty. Any difficulties in meeting these would be the subject of conference between the Directors of the Signal Department (Admiralty) and Research (Air Ministry). The Air Ministry would keep the Admiralty informed of any proposed improvements or new ventures under experimental trial, and there would be free exchange of technical discussion. The final design would be carried out by the Air Ministry.

ibid

3. Training ashore

When it was necessary to land units of the Fleet Air Arm to carry out training and exercises, the C.O. of the Carrier would inform the appropriate R.A.F. Commander on shore of the nature of training required. The R.A.F. Commander would be responsible that facilities were given and that the type of training required was carried out. This was to have preference over other requirements at those aerodromes set apart for the purposes of the Fleet Air Arm.

4. Carrier personnel of 'other ranks'

Naval ratings would be substituted for airmen in certain duties and trades:-

- (a) Seamen to replace Aircraft hands (general duties).
- (b) Marine attendants to be provided for Naval officers.
- (c) Naval cooks would replace R.A.F. cooks.
- (d) Naval torpedo ratings would replace R.A.F. fitters torpedo.
- (e) Certain trades such as Acetylene Welders, Blacksmiths, Carpenters, Fabric Workers, and Machinists would be carried out by Naval personnel.

This substitution would be gradual, the extent to which it was progressed being made dependent on experience.

5. Percentage of Naval officers

An agreed Admiralty Fleet Order was published<sup>(1)</sup> asking for volunteers for Naval Air Work of the Fleet by which, to the extent of 70 per cent, the officer personnel employed in the Fleet Air Arm

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(1) A.F.O. No. 1058, also issued as A.M.W.O. No. 551 dated 25 July 1924. A copy is in C.I.D. 503B.

might be provided for Naval officers attached temporarily to the R.A.F. for specific periods. These officers would be granted Air Force rank during attachment and would be eligible for advancement in the R.A.F. irrespective of their Navy rank. They would continue to wear naval uniform but with a distinguishing badge indicating attachment to the R.A.F. for service in the F.A.A. They would continue to draw their full naval pay with an additional allowance of 6s. Od. a day for flying duties. They would be available for ship duty in the Carrier in addition to flying duty and to emphasise this they would, when appointed to a Carrier, receive an appointment from the Admiralty as well as from the Air Ministry. Advancement in their naval rank would continue as under general naval regulations and service in the F.A.A. would be considered as good towards promotion as if they had served in any other naval specialist branch.

From among the number of officers who volunteered, 54 would be selected to undergo the first course. A further 54 would be required for each of the second and subsequent courses, which would start at intervals of approximately six months until such time as the total required had been trained. These numbers were required to make up the 70 per cent officer complement in the expanding carrier-borne F.A.A. There was no question of employing any of them ashore though Naval or Marine officers who had six or eight years' air experience might be favourably considered for higher posts in the F.A.A. both ashore and afloat.

6. Naval Observers

It was decided that in future all air observation duties for the Fleet, including gunnery spotting and reconnaissance, should be carried out by Naval Observers who would not be attached to the R.A.F.

(iii) Relative rank in the three Services

One other matter came up for consideration at this time. This was the question of relative rank in the three Services, now that attached naval officers were to be given a specific rank in the R.A.F. After the original creation of Air Force ranks in 1919 (see Chapter III section (iii) (a)) the relative positions allotted to Air Commodores and below gave cause for dissatisfaction in the older Services. After failure to agree in conferences, this feeling was finally voiced by the Admiralty in a paper sent to the Cabinet early in 1921. It was then proposed that the matter should go before an impartial arbitrator of Cabinet rank for decision and to this the Air Ministry fully agreed on 27 April 1921. However, nothing transpired and it was July 1922 before the Secretary of State for Air drew attention to the existing position and the renewed complaints from the other two Services. He appended a proposal for certain changes to be made in the comparative ranks of Air Commodore and below:-

A.H.B./III.55

C.P.2805/21

C.P.2890/21

C.P.4107/22

SECRET

94

A.H.B.  
III.55

Air Force Rank	Naval Rank	Army Rank
Air Commodore	Commodore	Colonel-Commandant
Group Captain	Captain	Colonel
Wing Commander	Commander	Lieutenant-Colonel
Squadron Leader	Lieutenant-Commander	Major
Flight Lieutenant	Lieutenant of 4 years and over	Captain
Flying Officer	Lieutenant of under 4 years	Lieutenant
Pilot Officer	Sub-Lieutenant	Second Lieutenant

To this the Admiralty replied that, as the ranks of Commodore in the Navy and Colonel-Commandant in the Army were purely temporary ranks, the relative rank of Air Commodore had no meaning. They also claimed that all naval lieutenants should rank with Captains in the Army and Flight Lieutenants in the Air Force, and that naval sub-lieutenants should be upgraded to the equivalent of Army lieutenants and Air Force flying officers.

C.P.4293/22

A.H.B.  
III.55

ibid

The Cabinet at last appointed a Committee in July 1922, under the chairmanship of Mr. Stanley Baldwin, to arbitrate. In his draft report and subsequent memorandum dated 26 October Mr. Baldwin supported the Admiralty's views but his recommendations were not accepted by either the War Office in C.P.4312 (20 November) or the Air Ministry in C.P.4349 (7 December). The latter made the point that the naval sub-lieutenant was a young officer learning his profession, he never exceeded the age of 23 years, and was only serving in his rank for a very short time whereas the period of service for a flying officer in the Air Force was of much longer duration and often continued up to the age of 30 years. His equivalent rank should therefore be a Lieutenant R.N.

ibid

The deadlock continued until June 1924 when the then First Lord (Lord Chelmsford) pointed out in C.P.336/24 that the question of relative rank had still not been decided. The Secretary of State for Air (Lord Thompson) shared the view that an early settlement was most desirable in the interests of all three Services. It was agreed to put forward a proposal that Lord Haldane, who was already conducting an inter-service enquiry, should be invited to arbitrate.

ibid  
encl. 42A

Accordingly the Cabinet asked Lord Haldane on 2 July to undertake this duty. After hearing the representatives of the three Services, he reported on 16 October 1924 that he was unable to find a practical solution which was acceptable to the Army and the Air Force for the ranks below that of Rear-Admiral in the Navy so he gave an overall ruling on the comparative ranks as below:-

Naval Rank	Army Rank	Air Force Rank
Admiral of the Fleet	Field Marshal	Marshal of the Royal Air Force <sup>(1)</sup>
Admiral	General	Air Chief Marshal
Vice-Admiral	Lieutenant General	Air Marshal
Rear-Admiral	Major General	Air Vice-Marshal
Commodore, 1st and 2nd class	Colonel-Commandant and Colonel on the Staff	Air Commodore
Captain	Colonel	Group Captain
Commander	Lieutenant-Colonel	Wing Commander
Lieutenant-Commander	Major	Squadron Leader
Lieutenant	Captain	Flight Lieutenant
Sub-Lieutenant	Lieutenant	Flying Officer or Observer Officer
Commissioned Warrant Officer	Second Lieutenant	Pilot Officer

ibid

ibid  
encl. 54A

This ruling was duly regularised by an Order in Council dated 6 February 1925 and has remained in force ever since.

(iv) Disagreement over Airship ControlA.H.B.  
ID2/71  
encl. 41

Once more it was thought that controversy was at last settled but again it appeared. This time it was over the question of airships. It will be remembered that back in November 1920, under the current stringent economy policy, the Air Ministry ceased temporarily to develop or construct new airships. In 1922 the Burney Scheme was proposed whereby a private company should develop airships mainly at Government expense for Imperial Communications. Questions of finance held up the scheme during the whole of 1923 and after the fall of the Conservative Government the new Labour Administration again investigated the Burney Scheme. Early in 1924 they turned it down on the score of expense and opposition to the setting up of a private monopoly. However, in May 1924 an alternative scheme, which had been put forward in February by the Secretary of State for Air, was accepted by the Cabinet. In this the Government and not the commercial company was in charge of development and the Air Ministry was authorised to recondition two of the existing paid off airships (R.33 and R.36) for a series of full-scale experiments, to carry out research for and construct a large airship (R.101) at Cardington together with the erection of such ground

C.P. 104(24),  
267(24) and  
274(24)A.H.B.  
IA/1/3

(1) The change in the designation of the most senior rank of the Royal Air Force from Marshal of the Air to Marshal of the Royal Air Force was approved by the King on 27 February 1925. (A.M. File 576014/25 Encl. 11A).

facilities as might be necessary at home, in Egypt, and in India. In addition, a contract was placed with the Burney interests to commence the simultaneous building of a second large airship to their own design at Howden which, if successful under trial, would be subject to lease by the Government if required for defence purposes.

In the Cabinet approval for this scheme they had, when describing the possible uses to which this experimental airship might be put, used the phrase 'whose primary function should be naval reconnaissance' although several other possibilities were envisaged such as the transport of aircraft, the transport of troops, and in the scheme of Home Defence - hence the use of the word 'primary'. Soon after the successful outcome of the Trenchard/Keyes discussions in July 1924, the Admiralty seized on this wording about naval reconnaissance and claimed that this and all subsequent airships must be manned and controlled by the Navy. This despite the accepted policy of three successive Governments that airship development and manning was the responsibility of the Air Ministry, not the Admiralty. Rising bitterness between the two Departments came to a head in October when, at the request of the Prime Minister, Lord Haldane undertook an investigation into the subject.

He convened two meetings during the third week of October at which were present the representatives of the Admiralty and Air Ministry, after which he circulated his impressions. These were considered by the Secretary of State for Air to be of so biased a nature and so contrary to the accepted principles governing Navy/Air relations that they drew very strong protests from him. They were at once taken up by the First Lord in an answering memorandum which contained the old familiar demands that Naval duties must be done by Naval personnel under Naval command and that the Navy would not have complete confidence in any airship developed or manned by another Service.

Early in November 1924 the Labour Government was defeated and in the General Election the Conservatives were returned to power.<sup>(1)</sup> Just before vacating office Lord Thompson circulated a memorandum on 4 November in which he deplored this claim by the Board of Admiralty. They were, he said, demanding a separate Naval Airship Service and were re-opening under a trivial pretext a question which, in the interests of all three fighting Services, the Air Council had hoped was at last closed. And there for the moment the matter remained in abeyance.

(v) The Colwyn Committee

Meanwhile during the latter part of 1924 and early 1925 the various rearrangements agreed to between Trenchard and Keyes were implemented and the amended Fleet Air Arm scheme was tried out in practice. There had been and still was no bad feeling or rancour between the two Services at the operational level either in the Carriers or the Coastal Area

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(1) Sir Samuel Hoare was once more appointed as Secretary of State for Air and Mr. F. C. Bridgeman became First Lord of the Admiralty.

establishments but there was a ceaseless nibbling at the policy agreements by the Admiralty staff who were obviously only awaiting an opportunity to re-open the battle at a high level.

A.H.B.  
IA/28/1

Such an opportunity came in the late summer of 1925. The Government was alarmed by the steady rise since 1922 in the Service Estimates and appointed a special committee to enquire into the subject. It was appointed by Treasury Minute on 13 August 1925 with terms of reference to investigate the expenditure falling upon Navy, Army, and Air Votes and to make recommendations with a view to effecting reduction in the cost of these services. The members were:-

Lord Colwyn - Chairman  
Lord Chalmers  
Lord Bradbury  
W. R. Fraser - Secretary )  
H. Parker - Asst. Secretary ) Treasury

A.H.B.  
ID2/71  
encls. 29  
and 30

The Admiralty went into action straight away and informed the Committee that a considerable saving in their Vote would result from an untrammelled ownership of the Fleet Air Arm. In further evidence to the Committee, the Admiralty threw overboard all the recommendations of the 1923 Salisbury and Balfour Committees, declared that the Trenchard/Keyes Agreement was unworkable and claimed that the scheme under which the Fleet Air Arm functioned was a failure. Once more the demand for a completely separate Naval Air Service was put forward and, sensing a possible victory for the Admiralty, the War Office at once entered a similar claim for a separate Army Air Force which soon merged into the old familiar attack on the existence of the third Service.

ibid  
encl. 48

Shocked by this resurrection of bitter controversy the Air Ministry retaliated by saying that the Trenchard/Keyes Agreement had only been achieved by wholesale abandonment of their real convictions in the cause of inter-service peace and that in reality they could run the Fleet Air Arm with the same or even better efficiency at far less cost if they had never departed from their original scheme of allowing only 20 per cent of posts to be filled by attached Naval pilots. They further pointed out that the ratio of 70 per cent Naval pilots which had been forced on them was continually being increased to apply to all kinds of shorebased posts in the Coastal Area and Technical Air Branches which were never envisaged in any of the recommendations or conclusions reached by impartial enquiry.

ibid  
encl. 14.

Resistance to all these demands and claims was embodied in a memorandum by the C.A.S. and sent to the Committee on 28 October. It was divided into six headings under which were given full details of the Organisation since the war, the proposed Air Force Estimates for 1926/27 with economies to be effected on the basis of existing policy, the Home Defence expansion scheme, the provision and cost of the Fleet Air Arm and proposals for substantial saving, and the functions of the Air Service in relation to the other Services. Finally the C.A.S. asked that, if like previous committees, Lord Colwyn came to the conclusion that the Separate Air Service was to remain, they could this time recommend in no uncertain manner that they deprecated very strongly the continual raising of

the same argument whenever the subject of economy was discussed, viz., that the only way was to abolish the third Service. Instead of working steadily on for economy and efficiency the Air Service had to be always preparing defences against attacks from the other Services. The amount of time which the Air Service had had to devote year after year to defending its existence was incalculable. It was bad for the whole Service, it was bad for the development of our defences, and it was bad for economy itself.

ibid  
encls. 1  
to 43

By mid-December an enormous number of written queries by the Committee on the subject of Air Force expenditure were answered by the Air Ministry together with much oral evidence. Similarly the Committee read and heard the evidence from the other two Services. The Committee's Report to the Prime Minister was made on 23 December 1925 and as far as affected the relations and questions at issue between the Services completely vindicated the Air Ministry's resistance. In Part I, which dealt with general policy on Defence Expenditure, Clause 6 found that the root cause of the collective increase in Defence Estimates was the lack of a co-ordinating control and that the 1923 decision whereby the Committee of Imperial Defence should consider such expenditure had not had the results hoped for.

A.H.B.  
IA/28/1

Clause 7 stated that the Committee found no remedy for immediate reduction of expenditure either in the creation of a Minister of Defence to replace the three existing Service Ministers or in the abolition of the Air Ministry which was urged by the two older Departments. On the contrary, they affirmed the necessity for an independent Air Ministry to administer a single Unified Air Service which should carry out all air work whether for the Navy, Army, or Central Air Force. They did not think that any of the savings which the other two Departments claimed would result from its dismemberment would materialise, nor would any such possible savings compensate in any way for the greater saving which would, they hoped, be secured by the extended substitution of Air Power as a substantive arm.

Clause 8 dealt with the Fleet Air Arm and the Committee stated that while they recognised the special value of the use of naval officers as Observers, they saw no reason for their employment as Pilots. Regarding the existing arrangements, reached as a compromise between the conflicting views of the two Services, they recommended that the future basis on which the Fleet Air Arm should be manned was to be:-

ibid

- (a) Officers for observation duties to continue to be Naval Officers.
- (b) Not more than 30 per cent of the remaining officer personnel of the Fleet Air Arm (i.e. that portion of the Air Force which was normally embarked in Carriers) should consist of attached Naval Officers, though it should be understood that officers comprising this 30 per cent would also be eligible for senior appointments in Air Force units connected with the training and maintenance of the Fleet Air Arm.
- (c) The balance of not less than 70 per cent should consist of Air Force Officers, including a suitable

proportion of officers holding short-service commissions so as to provide an adequate reserve on an economical basis.

- (d) The substitution of Naval ratings for Air Force personnel in Carriers should be confined to cases where it was definitely established that a reduction in numbers could thus be effected.

ibid

In Clauses 9 and 10 the Committee concluded that the desired reduction of Defence Expenditure could only be secured if the Government fixed a total for National Defence. This to be arrived at by a Cabinet Committee consisting of the Prime Minister as President, a Chairman as deputy, the Chancellor of the Exchequer and the Foreign Secretary, with the three Service Ministers not as members but presenting their Estimates to it for approval. The same Committee to be charged with the duty of allocating the total so fixed between the three Departments.

After some cutting criticism in Clause 14 of the wasteful method in the Admiralty administration, the Report went on in Parts II, III and IV to criticise in detail the expenditure by the three Services. Resulting from this the Committee concluded that it was practicable to reduce the Navy Estimates by £7 million, and the Army and Air Force by £2 million each. The Committee finally reported that it had proved impossible to gain agreement to this reduction by the Navy but there was little serious opposition by the Army and none by the Air Force.

A.H.B.  
ID2/71  
encl. 50

ibid  
encl. 54

In the Air Ministry the feeling was one of relief that not only was the principle of the Unified Air Force once more upheld but that the Admiralty's claim for a separate Naval Air Service was again refused and furthermore the percentages of officer personnel in the Fleet Air Arm were actually reversed in favour of the Air Force. The C.A.S. remarked on 18 January 1926 that it was of great importance that these recommendations should be clinched at once by their explicit adoption by the Cabinet and in a form which would relieve the Air Force from the chronic uncertainty of the future under which it had laboured for so long. Moreover, as the Secretary of State for Air pointed out on 21 January, the reduction of the Air Estimates to the Colwyn Committee figure depended largely on the new percentages for the Fleet Air Arm being enforced.

ibid  
encl. 55

Later in the month, rumours reached the Air Ministry that the Admiralty intended after all to accept the financial cuts proposed in the Colwyn Report but would ignore the more unpalatable clauses including the new percentages for the Fleet Air Arm until a lapse of time enabled them to re-open the whole subject on the ground that no decisive ruling had been expressed. With this in mind the C.A.S. on 27 January wrote an impassioned letter to Mr. Winston Churchill<sup>(1)</sup> as the man who originally had put him into the job of creating an independent Air Force. In it he gave the salient findings of the Colwyn Committee and said that as the Prime Minister had stated last November in the House of Commons that the question of abolishing the Air Ministry in the interests of economy

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(1) At this time Mr. Winston Churchill was Chancellor of the Exchequer.

ibid  
encl. 56

and efficiency would fall within the scope of the Colwyn Committee, it was reasonable therefore that the Cabinet should endorse all the findings under this head. Let there be no more Committees, he continued, to waste their time and ours on issues which have been tried and retried half-a-dozen times and have without exception always given a verdict in favour of the Air Service. He appealed to him to persuade the Government to give a 'once and for all' decisive endorsement.

As can be imagined the Colwyn Report was received by the Admiralty with anger. In a letter to the Prime Minister dated 30 January, the First Lord denied all knowledge of any claim to abolish the Air Ministry but he still maintained the claims to the Fleet Air Arm in the interests of economy and efficiency. Briefly these were:-

A.H.B.  
ID/3/6

- (a) That liaison with the Air Ministry in matters of research and design be strengthened.
- (b) That in view of it having been proved that sailors could fly, the entire personnel of the Fleet Air Arm should be naval.
- (c) That the Admiralty should assume responsibility for the Coastal Area work now performed by the Air Ministry.

A.H.B.  
ID2/71  
encl. 57

Certain now that the Admiralty would ignore the Colwyn Committee findings, the C.A.S. saw the Prime Minister on 4 February and personally put his case in a similar form as that addressed to Mr. Churchill. He subsequently confirmed his remarks in a letter and begged him to endorse Clause 7 and 8 of the Report. This was followed on 12 February by an official letter to the Prime Minister from the Secretary of State for Air in which the disputes about the Fleet Air Arm were recapitulated and the relevant findings by the Colwyn Committee were high-lighted. It ended by emphasising the need for an immediate decision and expressed the opinion that a final pronouncement would at long last bring to an end this harmful controversy.

A.H.B.  
ID2/98  
encl. 12

(vi) Arbitration by the Prime Minister

Mr. Baldwin was sympathetic but contented himself with an immediate public endorsement of Clause 7 only. This he did in the House of Commons on 25 February 1926 when, in answer to a question put by Mr. Ramsay MacDonald, he said:-

'I think it essential to announce that, in accordance with the policy of successive Administrations, the Government have no intention of re-opening the question of the separate Air Arm and Air Ministry. We intend to pursue the organisation of Imperial Defence on the existing basis of three co-equal Services. It is in the interests of the Fighting Services that controversy upon this subject should now cease. We are convinced that the way to secure the higher co-ordination in our Defence machinery, indispensable to full efficiency and indeed to economy, lies not in the abolition of any one of the three established arms of His Majesty's Forces but in combined action between all three through the machinery of the Committee of Imperial Defence and the

A.H.B.  
IIA/1/47  
encl. 25  
and  
Hansard  
25.2.26

agency of the recently instituted Committee of Chiefs of Staff. We are sure that we can rely upon all concerned to devote themselves loyally and whole-heartedly to this end.'

A.H.B.  
ID2/98  
encl. 21

Regarding the Fleet Air Arm dispute, the Prime Minister requested further information and on 8 March the C.A.S. sent him a memorandum giving the same full details as given in evidence before the Colwyn Committee, and in which the cost of a 70 per cent Naval ratio was shown to exceed that of an Arm manned by 80 per cent R.A.F. officers by £400,000. How much more therefore would the extravagance be if the Navy realised their present demand for 100 per cent including all the Coastal Area.

ibid  
encls. 14,  
16 and 18

On their part the Admiralty for the moment did not stress their demand for the transfer of the whole Fleet Air Arm but in the ensuing weeks put forward specific claims to have complete control over the shorebased units known as Coastal Reconnaissance Flights,<sup>(1)</sup> similar complete control over Airships, and to have Naval Engineer officers trained in flying so that they could replace R.A.F. officers in technical posts.

ibid  
encl. 22

Relations between the two Departments became increasingly bitter during April but recourse to higher authority was temporarily held up by the General Strike in May. Early in June the First Lord wrote the Prime Minister giving a further statement in which the Admiralty contentions were brought up to date and emphasising the extreme urgency for a decision on the questions at issue. On 9 June the Secretary of State for Air once more outlined the grounds for the Air Ministry's opposition and asked for final arbitration.

ibid  
encl. 23

This was given by the Prime Minister in a long letter dated 2 July 1926 and addressed to the two Ministers concerned. In his preliminary remarks he noted that the Trenchard/Keyes Agreement of 4 July 1924 was covered by a letter signed by the two representatives expressing 'a hope that the main principles of the scheme would provide a lasting and satisfactory settlement of the questions at issue'. Yet within little more than twelve months these main principles were again re-opened before the Colwyn Committee. It was impossible to achieve progress if decisions of the Government were to be put in question at every opportunity. His arbitration was given under four headings:-

1. The necessity for an independent Air Ministry to administer a Single Unified Air Service to carry out all work whether for the Navy, Army or Central Air Force -- He had already announced in the House of Commons that the Government had no intention of

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(1) In fact there were at this time only two such Flights - No. 480 (Flying boats) at Calshot and No. 481 (Float sea-planes) at Malta but in the near future the formation of others was envisaged, not only at various bases in the United Kingdom but overseas at Singapore, Aden and Karachi. Although the Coastal Reconnaissance Flights carried out, among other functions, naval co-operation work they did not form part of the Fleet Air Arm and were entirely manned and administered by the Air Ministry.

re-opening the question of the separate Air Arm and Air Ministry. The Air Ministry must continue to be responsible, subject to the adjustments made by the Balfour Report and the Trenchard/Keyes Agreement, for the raising, training and maintaining of the Fleet Air Arm which at sea came under the operational and disciplinary control of the Admiralty, by whom the Carriers were built.

ibid

2. The percentage of Naval and Air Force officers in the Fleet Air Arm - He was not prepared to reverse the recommendations of the Balfour Committee which were 'to leave it to the Admiralty to determine what the proportion should be, subject to the proviso that not less than 30 per cent of Air Force officers, whether regular or short-service, should serve on board the Carriers'. He did, however, urge the Admiralty in their own interests to weigh very carefully the advantages of greater economy on which the Colwyn Committee based its recommendation. If the Admiralty would now dismiss from their minds all thought of an exclusively Naval Fleet Air Arm they might find it advantageous to reduce the proportion of Naval officers.

ibid

3. The officer personnel at aerodromes and shore establishments necessary for the maintenance and operations of the Fleet Air Arm - He had satisfied himself that the Balfour Committee intended the proportion of Officers in the Fleet Air Arm to apply only to those serving on board the Carriers and his decision was that the 70-30 ratio should apply only to the Fleet Air Arm afloat and not to any shore establishment.

4. The control of R.A.F. units operating from shore bases, known to the Admiralty as Naval Co-operation Units and to the Air Force as Coastal Reconnaissance Flights - His decision was that this matter fell within the principle in regard to the co-operation of the three Services announced in the House of Commons on 16 March 1922 i.e. 'That in other cases (such as the protection of commerce and attack on enemy harbours and inland towns) the relations between the Air Force and the other Services should be rather a matter of co-operation than that of strict subordination'. He thought the whole question clearly required a detailed joint examination by the Staffs of the two Services and he understood that this was envisaged already by the Chiefs of Staff Committee in their C.I.D. 701B.

ibid

C.I.D. 701B  
para. 40  
A.H.B./IB/3/15

He did not propose to deal with the question of Airships as he had been informed that the Admiralty now had no desire to be concerned with the two experimental airships under construction. Finally the Prime Minister said that from a study of the questions submitted to his arbitration he had formed the impression that the liaison between the two Departments had not hitherto been as close as might be desired. He therefore urged the two Ministers concerned to strengthen the inter-Departmental machinery and gave advice as to how this might be effected.

A.H.B.  
ID/3/6

Here at last was a clear cut decision by the Head of the Government which bade fair to settle finally the long inter-service controversy. The two Departmental Ministers exchanged letters of mutual assurance on future wholehearted co-operation and agreed to institute joint staff meetings to discuss the outstanding matter of shorebased aircraft control and other minor points still at issue. The C.A.S. marked the occasion by writing a general letter to his Air Vice-Marshal explaining the Prime Minister's rulings, expressing his belief that all controversy was at an end, and calling for unqualified good feeling and co-operation in the future.

A.H.B.  
ID2/98  
encl. 24

(vii) Shorebased maritime aircraft to remain under the Air Ministry

A.H.B.  
ID2/101  
Part I  
encl. 4

It was in this new atmosphere of 'sweet reasonableness' that the question of ownership of the Coastal Reconnaissance Units was investigated. Prior to the Prime Minister's arbitration certain requirements for maritime aircraft had been put forward by the Admiralty. These included a specific number of shorebased aircraft for Naval Co-operation duties,<sup>(1)</sup> facilities to accommodate ashore the Fleet Air Arm units aboard the Carriers overseas at Singapore and Malta, and a general expansion in Fleet Air Arm strength in readiness for the new Carriers about to commission.<sup>(2)</sup> The policy underlying these requirements was subsequently discussed between the Staffs and in Chiefs of Staff Committee but the question of ownership of shorebased maritime aircraft formed the subject of direct negotiation between the C.A.S. and the D.C.N.S. (Vice-Admiral Sir F. Field) in the absence of the First Sea Lord (Lord Beatty) who was sick. After an exchange of views between these two it was agreed on 20 July that the shorebased maritime aircraft should continue to be under the Air Ministry and that in peacetime the programme of their training and exercises should be arranged for the convenience of both parties so as to secure the maximum amount of co-operation between these units and the Navy. In time of war the question of their employment would go through the organisation of the Chiefs of Staff Committee. It was also agreed that these units should have the standardised name of 'Coastal Reconnaissance Units'.

ibid  
Part II  
encl. 13

(viii) Disagreement over proposed entry of naval ratings as pilots

A.H.B.  
ID/3/2  
end of

A new rift between the two Services made its appearance in November 1926. The Admiralty, through their self-appointed burden of 70 per cent naval pilots and with a Fleet Air Arm expansion of the offing, found themselves unable to find the requisite number of officer volunteers. On 24 November they proposed to introduce Seamen or Marine ratings as pilots up to 25 per cent of their quota. Their scheme provided, after the year's preliminary flying training, for five years service as a pilot after which they would return to ordinary naval duties and act as a reserve.

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- (1) An immediate increase to 23 aircraft at home and 26 abroad compared with the existing five at home and six at Malta. A future expansion to 46 at home by 1929.
- (2) This amounted to a total of 241 aircraft by 1935 compared with the existing strength of 105.

In their reply of 23 December, the Air Ministry agreed that the maintenance of 70 per cent naval officer pilots was a needlessly extravagant way of manning the Fleet Air Arm and provided no adequate reserve but they stated that any substitution of officers should be by Airmen pilots. The whole object of the attachment of naval pilots to the Fleet Air Arm as recommended by the Balfour Committee was to ultimately permeate the higher ranks of the Navy with first hand air experience which obviously would not result from Able Seamen appointments. Moreover, as Airmen pilots had a better basic experience in handling aircraft as well as three years training as aircraft apprentices, they would produce as large as and a better reserve which was much easier to keep in flying training because they returned after the tour of duty to air squadrons in the R.A.F. Furthermore there already existed airmen pilots in the Central R.A.F. squadrons.

On 19 February 1927, the First Lord wrote to the Secretary of State for Air that the Air Ministry's views were noted but he could not accept any reduction in the 70 per cent naval quota which was 'the very minimum necessary for the operation of the Fleet Air Arm in a manner at all suited to naval requirements'. He admitted that the Balfour Agreement referred exclusively to Officers but he held each Service to be free to introduce non-commissioned pilots within its own quota. To this the Secretary of State replied on 11 March that the proposal was entirely new and he could not agree. Moreover the point was not raised in the Admiralty claims submitted for the Prime Minister's arbitration in July 1926 although it was expressly stated by them that their case covered all outstanding questions. An exchange of letters continued in the same vein, but with rising acerbity, until the end of May.

The First Lord then referred the question to the Prime Minister for a decision in a letter to which was appended his version of the dispute. For his part the Secretary of State for Air suggested to the Prime Minister that, as his arbitration of a year ago had settled all outstanding questions between the two Departments, he might not think it necessary to do so again upon this new point, but if he did so decide a statement of the Air Ministry's case would be sent. This was done on 11 July giving full reasoning for the Air Ministry's refusal to accept what had now become an Admiralty demand backed up by misstatements.

(ix) Arbitration by Lord Salisbury.

Owing to the pressure upon the Prime Minister's time he found it impossible to give the matter his attention during the remainder of 1927. In January 1928, faced as he was with the burdens of a new Parliamentary Session, he asked Lord Salisbury (the Lord Privy Seal) to undertake the arbitration on his behalf. On 30 January, the Secretary of State for Air sent Lord Salisbury a long memorandum in which was embodied the rulings by previous Cabinet Committees on Fleet Air Arm personnel matters, the course of the disputes on this subject down to the Colwyn Committee, and the subsequent appearance of this new demand by the Admiralty together with the reasons for the Air Ministry refusal to accept it.

The feeling between the two Departments was worsened on 10 February when the Admiralty issued a Fleet Order altering

ibid

A.H.B.  
ID2/99  
encls. 1  
and 2

ibid  
encls. 3, 11,  
13 and 16

ibid  
encls. 17,  
18 and 21

ibid  
encl. 23

ibid  
encls. 24  
to 27 and  
29, 30, 32,  
33, 38, 39  
and 41

See also  
C.I.D. 867B  
A.H.B.  
IB/3/17

the period of attachment for naval pilots to the Fleet Air Arm in defiance of disagreement by the Air Ministry and which formed one of the points then sub judice by Lord Salisbury. The subsequent angry exchange of letters continued until the end of the month. By early March both sides had furnished Lord Salisbury with their detailed cases and on the 22 March 1928 he sent his reasoned arbitration to the Prime Minister who concurred in them. Very briefly they were:-

- (1) The source from which Naval pilots were to be recruited was the ranks of Naval Officers.
- (2) The period of attachment to the R.A.F. of all naval pilots was to be prescribed by the Admiralty with the concurrence of the Air Ministry, but that concurrence should not be unreasonably withheld.
- (3) If there remained any point which could not be adjusted between them by the Services themselves, an appeal should be made to the Chiefs of Staff presided over by the Chairman of the Imperial Defence Committee.

This proved to be the last of serious controversy between the two Services for a number of years - years which saw a growing disillusionment about measures of general disarmament and an awakening to the threat of a resurgent Germany.

(x) Summary

There is no doubt that during the 1919/22 period there existed a very real possibility that the Air Force would lose its identity as a separate Service. Many of the high rank Air Force officers were ex-Army with all the late war precepts still in memory of the ancillary nature of the air arm. Reabsorption by the War Office was the more likely in that between early 1919 and 1921 the two Services had a common political head. On the other hand there were some who saw naval control as a more sympathetic atmosphere for their aspirations. The innate flexibility of mind associated with the Royal Navy in its tradition, training and general outlook seemed much more akin to the enthusiasts who were convinced that the future lay in breaking new ground in War both strategically and tactically so as to take full advantage of the freedom of the third element. This feeling had been engendered by the experience of the 1914/18 War in which the Navy had displayed far more enterprise in utilising the new-found air possibilities than the rigid conception of Army Co-operation which had been the role of the R.F.C.

Moreover in the immediate postwar period there was no Specific Peacetime Role to act as a rally point for the Air Force, analagous to the traditional policing of the Seven Seas by the Navy and the maintenance of order in the Empire by the Army. It was not till the Royal Air Force had such signal successes in suppressing unrest in Somaliland, Palestine and Iraq at a fraction of the cost of military expeditions that a special role became apparent. This was made even more apparent in 1922 when the R.A.F. was empowered to raise 20 squadrons from Home Defence (increased to 52 squadrons in 1923).

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Thenceforward the R.A.F. Role remained distinct in that it could not be performed by either of the older Services. Although it had to weather some further attacks, the Separate Air Service was never again in serious danger. Most of the subsequent attacks came from the Admiralty but were directed mainly to recover ownership of the Fleet Air Arm. It has been since admitted, even by Lord Trenchard, that perhaps the control and development of all maritime aircraft should have remained with the Navy from 1919 onwards. Certainly the subsequent bitterness of Navy/Air controversy can be attributed to the insistence of the Air Council to perpetuate the anachronistic Fleet Air Arm. At the same time it must be said that before they ultimately regained the Fleet Air Arm, the Admiralty displayed a positive genius for tactless demands backed up at times with completely untenable overstatements and dubious political lobbying.

After the March 1928 arbitration by Lord Salisbury there followed a period of some years of relative peace between the two Services during which both sides endeavoured to make the joint Fleet Air Arm scheme a success in providing for naval aviation afloat. It is convenient therefore to turn back and examine the tactical policies together with the operational training and exercises which were progressing unaffected by all the high level controversies.

CHAPTER VI

SLOW EXPANSION AND LIMITED OPERATIONAL TRAINING  
1923 TO 1934

(i) Introduction

During the years from 1919 to 1923 the maritime component of the Royal Air Force was almost exclusively shipborne and working under the orders of the Fleet. As such its size was limited to the number of aircraft carriers which the Admiralty could keep in commission and it rarely numbered more than 48 aircraft. The shorebased element, under R.A.F. Coastal Area ownership, was even more circumscribed in strength and consisted of only one squadron of ten flying boats who were nominally responsible in case of war for anti-submarine patrols, convoy protection, reconnaissance and attack on enemy naval forces in narrow waters.<sup>(1)</sup> Not only was national economy a bar to any increase in this tiny force but it was part of the Air Ministry policy of flexibility that air units primarily allotted to Home Defence could, if the situation needed it, co-operate from shore bases in performing some of these duties. In other words the Home Defence Force was regarded as a general reserve of air power which would be drawn upon for other areas and duties if the situation permitted.<sup>(2)</sup> With the "Ten Year Rule" in force and no pressing foreign menace in sight, this position had to be accepted much as the Admiralty disliked it.<sup>(3)</sup>

Although the creation of a Home Defence Force of 20 squadrons was approved by the Cabinet in August 1922, few squadrons were serviceable a year later in 1923 when the Government decided to adopt an Expansion Programme to provide 52 squadrons (35 Bomber and 17 Fighter) by April 1930. This again had produced few squadrons before it was slowed down by Cabinet order in 1925 and the completion date put off to 1935. So in January 1929 there were still only 13 regular squadrons of bomber aircraft in service. With their main task that of attacking an enemy's air potential there had been no training or exercise in maritime duties for which they might never be required. What small diversion was possible from purely Home Defence training was expended on trial bombings of target battleships - a subject dealt with in Chapter IX.

See Appendix V

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- (1) There was a squadron of mixed flying boats and seaplanes in the Mediterranean but they were administered by the Air Authority at Malta.
  - (2) This view was officially reaffirmed in June 1926 by the Chiefs of Staff in C.O.S.41 and confirmed by the Committee of Imperial Defence in C.I.D.701-B.
  - (3) This doctrine of flexibility of 'ubiquity' to which the Air Staff adhered from 1920 onwards was never accepted by the Admiralty as producing true efficiency. Their belief has always been that air tasks at sea, whether by shipborne or shorebased aircraft, need specialised training and personnel. Their motto is that a Jack of all trades is Master of none.

(ii) The early years and limited training of shorebased maritime aircraft

In 1923 the one shore based maritime squadron at home was reduced to a Coastal Reconnaissance Flight of seven F.5 type flying boats based at Calshot. Much of their time was spent in conjunction with the Seaplane Training Flight in giving operational experience to the trainees. Occasionally, when Fleet exercises were being conducted in the Channel area, their flying boats took part in air reconnaissance exercises. They were also sometimes employed in "sighting and report" exercises with the submarines based at Gosport. Similarly, at the end of 1923 the Mediterranean squadron was cut down to one flight of 12 seaplanes thus reducing even the small amount of co-operation reconnaissance exercises that they had been doing with the Mediterranean Fleet.

Up to the end of 1928 there are few records of any systematic operational exercises by the shore based aircraft. Much of their time during summer months was spent on extended cruises to test their ability to operate from temporary bases. There was also fairly continuous development flying to improve the types of flying boat. For instance, during the autumn of 1922 a cruise was made to the Scilly Islands in company with the carrier Ark Royal to test the comparative performances of several types of flying boats. In the same year the flight of five F.2.A boats of No. 267 Squadron at Malta carried out 20 cruises of varying distances on extended trials. In the summer of 1924, three F.5 boats left Felixstowe to co-operate with the Scottish Fishery Board in location of shoals of fish and to test the maintenance of a flight of flying boats at an isolated base with no special air facilities. The task involved much sea patrolling and provided good training for reconnaissance. By March 1925 the 'Southampton' flying boat was being produced as a replacement for the F.5 and in July 1926 a cruise to Aboukir was undertaken by two Southamptons during which they covered some 6,000 miles.

In May 1925 the Admiralty put in a demand for this tiny shorebased element to be raised immediately to a total of 23 flying boats at home and 26 abroad, with a further 23 boats at home by 1929. National economy was, however, still an effective curb and by April 1926 the strength remained at only six Southampton flying boats at home and twelve Fairey IIID seaplanes at Malta. With such limited numbers, operational training and exercises were almost non-existent and the Admiralty was increasingly concerned about the question of protection of commerce in the narrow seas in the event of a war with a Western Power. It will be remembered from Chapter V section (vii) that in July 1926 agreement was reached between the Chief of the Air Staff and the Deputy Chief of the Naval Staff that the Coastal Reconnaissance flights should continue under Air Ministry control and it had been assumed by them that there would be early discussions leading to decisions at Committee of Imperial Defence level on a policy for the co-operation between the Navy and Air Force in commerce protection. In fact, by 1929 no such decisions had been arrived at although a few exercises between warships and shore-based aircraft had been staged. The reason was not far to seek. Up to October 1928 there was only one flight of such aircraft at home and one at Malta. No progress could be made in formulating any co-operation technique with such a tiny

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force. Systematic operational exercises were, therefore, virtually confined during the years 1923 to 1928 to the air units raised and employed for the Fleet and which by mid-1923 were known as the Fleet Air Arm.

(iii) The expansion of the shipborne or Fleet Air Arm component

The number of shipborne aircraft or Fleet Air Arm rose from a diminutive first line strength of 46 in April 1923 to 84 by April 1924 and 105 by April 1926. During these years the Carriers were the Argus, Hermes, Eagle, Furious and Pegasus but not all were in commission at any one time. In order to be ready to provision the two large carriers then under reconstruction (Courageous and Glorious) the Admiralty on 25 May 1926 put forward a programme of expansion which required a total of 241 aircraft by 1935. This figure of 241 was arrived at by totalling the full stowage capacity of the two new carriers with those already in commission and adding a further 50 aircraft for capital ships and cruisers.<sup>(1)</sup> The Air Ministry could not agree to this programme plus the earlier request for shorebased flying boats partly because they did not believe that the Carriers could actually operate the numbers so crammed into their stowage, partly because of the difficulties in raising and training the new personnel, and partly because of the ever present question of financial stringency.

A.H.B.  
IIA/1/41  
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In July 1926 the Air Ministry made a counter proposal which they considered more realistic. They undertook to build up the Fleet Air Arm to 144 aircraft by 1930 and to increase the shore based Coastal Reconnaissance flights by five flying boats at home, five in the Far East at Singapore and six seaplanes in Ceylon or the Persian Gulf by mid-1929.

ibid

As far as the Coastal Reconnaissance programme was concerned this did not satisfy the Admiralty for at a Combined Inter-Service Meeting held on 31 March 1927 they produced a memorandum outlining their requirements for flying boat strength in which the minimum needs before an outbreak of war were 41 flights at home and 12 flights in the Far East. The paper did not give a date by which this increase was considered necessary nor how many boats were to constitute a flight but on a rough basis this meant 200 at home and 60 in the Far East. Such figures were of course quite unreal in 1927 even as a very distant target date. The 'No war for ten years rule' alone put it out of court. Although the original 'Ten year Rule' of 1919 was withdrawn in July 1928 it was replaced by an assumption of no major war for ten years which ran continuously from day to day but was subject to an annual re-affirmation by the Cabinet. Such re-affirmation was made in June 1929. However, in both the 1928 and 1929 annual reviews of Imperial Defence Policy the Chiefs of Staff Sub-Committee recorded that the number of aircraft authorised for Coastal Reconnaissance units was considerably below the minimum considered necessary.

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encl. 25

C.I.D.358-C

C.I.D.896-B

C.I.D.900-B  
and 948-B

(1) The allocation of aircraft was:- Courageous 52, Glorious 52, Furious 36, Hermes 15, Eagle 18, Argus 15, Vindictive 3, and 50 for battleships and cruisers. These latter were to be spotters and fighters.

In fact, by mid-1929 the first line strength of the Fleet Air Arm had reached 141 aircraft, and the shorebased element of maritime aircraft was 20 at home and 20 abroad.<sup>(1)</sup> In July 1929 another two programmes for the future expansion of the maritime air forces were put by the Admiralty before the Fighting Services Committee of the Cabinet. In one, the existing Fleet Air Arm strength was to be raised as soon as possible to the 241 aircraft previously claimed. Of these, 176 were for the Carriers<sup>(2)</sup> and 65 were for capital ships and cruisers. In the other, the shorebased force was to expand to 46 flying boats and 48 torpedo bombers at home, and to 41 flying boats and 72 torpedo bombers abroad (mostly in the Far East).

Both these programmes were under consideration during the autumn of 1929 but although accepting that some expansion was most desirable, the Air Ministry was more concerned about the larger question of repercussions of such increases in the forthcoming General Disarmament Conference. The subsequent story is continued in Section (viii). We will now turn to the types of aircraft provided for the Fleet Air Arm.

(iv) Fleet Air Arm supply and aircraft types

Before recounting the training and exercises carried out by the Fleet Air Arm it is as well to visualise the supply conditions pertaining to this branch of the R.A.F. from 1923 onwards and to note the types of aircraft with which it was equipped.

The Balfour Committee of 1923 laid down that the then existing arrangements for new design, experimental and research work to meet Naval requirements were to continue to be carried out by the Air Ministry after consultation with the Admiralty. In this the Air Ministry was to utilise the services of certain ex-Naval officers who had transferred to the Air Force and were to be guided by a Joint Technical Committee on aviation arrangements in H.M. ships. This was satisfactory for a period but the ex-Naval officers referred to gradually disappeared through retirement and their experience was not replaced by Air Force officers with the Fleet Air Arm owing to their relatively short time of service with this branch. Moreover there was by 1930 a general lack of contact by senior Naval officers with the atmosphere of aviation and a similar lack of realisation by senior Air Force officers of the Navy's needs.

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- (1) In September 1928 a torpedo bomber squadron of 12 Horsley aircraft was formed at home and in October another flying boat flight was added. On 1 January 1929 the flying boat flights were re-numbered as Squadrons though still remaining at a strength of six aircraft (4 I.E. plus 2 I.R.). By the autumn of 1929 there were two squadrons of flying boats and one of torpedo bombers at home, one squadron of seaplanes at Malta, one squadron of flying boats at Basrah in the Persian Gulf and one squadron of flying boats at Singapore. Details are at Appendix V under the appropriate year and month.
- (2) The Carriers were now listed as the Courageous 52, Glorious 52, Furious 36, Eagle 18, Hermes 15, and Vindictive 3.

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A.H.B.  
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encl. 63

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Admty.  
C.B.3307(1)  
Chap. II

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In the Advisory Committee on F.A.A. aircraft types and its Technical Sub-Committee, although there was naval representation, the direction was mainly an Air Force matter. It was therefore inevitable that R.A.F. types of aircraft were adapted to F.A.A. use and not specifically designed as carrier borne naval aircraft either as regards performance and duty or their ease of stowage in a carrier. These adaptations of aircraft basically designed for R.A.F. land operations presented no particular disadvantage while such types were small and light but with the arrival of more advanced, heavier and larger aircraft the F.A.A. tended to be stuck with either obsolete or inferior types. Except in the case of torpedo carrying aircraft special designs for naval aviation were virtually ruled out. This need for specialised design was realised in America from 1929 onwards and thereafter purely naval types of aircraft were provided for the U.S. Fleet by such firms as Grumman and Vought who were encouraged to devote their whole energy to this end. There were of course further handicaps in this country imposed by financial stringency and the influence of incessant preparatory and main Disarmament Conferences between 1926 and 1934. However, other countries, notably America and Japan, were not so restricted either by political, financial or inter-service differences of opinion and they forged ahead not only in carrier design but in number of aircraft which, contrary to British practice, were exclusively designed for naval work. This led to the possession by these countries in the 2nd World War of a much higher standard of carrier aircraft than that available to us.

The Air Ministry policy of 'ubiquity' whereby in theory any aircraft type or crew could with a minimum of adaptation and training perform any task received Governmental support right up to 1937 in the case of the Fleet Air Arm and for many years after in respect of shorebased aviation. Whether complete control by the Admiralty would have resulted in a less or greater state of unpreparedness in our 1939 maritime air power is still a subject for debate.

In May 1923 the Fleet Air Arm was reorganised into Flights of six aircraft because this unit was most suited to handling either operationally in Carriers at sea or in disembarked shore training. The four categories of aircraft were Fighters, Spotters, Reconnaissance, and Torpedo. The names are self explanatory of their duties except that the primary task of a Spotter was the detection and report of any change of course by the enemy fleet and a constant estimation of the inclination between this and the line of fire - fall of shot spotting was of secondary importance.

Although in 1924 a small amphibian (the Seagull III) was introduced to combine spotting and short range reconnaissance it was not till April 1928 that the Fairey IIIIF was adapted to merge the two categories into Spotter Reconnaissance Flights. Thereafter the three categories remained distinct, through 1933 when the larger Carriers in commission enabled Flights to be fused into squadrons of twelve aircraft, until 1935 when the Shark aircraft was introduced which combined Spotter Reconnaissance with Torpedo duties. This type was known as a Torpedo/Spotter/Reconnaissance or T.S.R. for short. In 1936 the Shark was replaced by the famous Swordfish. The same year saw the introduction

of the equally famous Walrus as a catapult reconnaissance aircraft carried in battleships and cruisers.

Appendix V shows the disposition of Fleet Air Arm flights and squadrons on various dates between 1923 and 1937 while Appendix VI gives details of aircraft types, performances and year of introduction into service.

(v) Fleet Air Arm operational training and exercises - 1921 to 1934

It must be remembered that from 1921 until the end of 1928, the maritime component of the R.A.F. was almost exclusively shipborne. It was not till the latter date that the first shorebased torpedo-bomber squadron became operational and not until well into 1929 was the minute flying boat force increased. Although the operational control, when shipborne, was in the hands of the Navy, the administration, all the initial training and much of the operational training was done by the R.A.F. The national financial stringency limited the amount of time which the carriers could spend at sea on practising their aircraft and the bulk of the flying training had to be done while disembarked at the R.A.F. stations in East Scotland and around Portsmouth. Full scale exercises with the Fleet at sea took place only occasionally and on termination it was the custom for the Naval authority afloat to indicate to the R.A.F. Station Commander in what respect it was wished that training should be intensified or altered.

Records of the training in reconnaissance and spotting are scanty but exercises in these took place on all occasions of Fleet Gunnery practices. The evidence from Fleet Exercises is more complete and as these always culminated in an airborne torpedo attack it is this aspect that is most to the fore. It was the Fleet Action, in which the shipborne aircraft's primary weapon was the torpedo, which dominated in the minds of all and every exercise was designed with this end in view.

(a) Torpedo attack exercises

In view of a commonly held belief that the Air Ministry have always been opposed to or at least lukewarm towards the use of the torpedo, it may be stated here that the importance of the torpedo as an airborne weapon was stressed continuously by Lord Trenchard right up to the end of his tenure of the post of Chief of the Air Staff in December 1929.

The division of responsibility between the Admiralty and Air Ministry for the development of torpedoes and bombs for use against ships was the subject of correspondence between the two Departments during 1922. After an exhaustive review of the question the conclusions of the Air Council were to recognise 'that the Admiralty possess peculiar experience in the employment of the torpedo as well as the mechanism for future development and that under these circumstances the logical and economical course appears to be to adopt the principle of the responsibility of the biggest user acting in close collaboration with the other Department concerned. On this principle the development of torpedoes should lie with the Admiralty and bomb development with the Air Ministry whilst in both cases design is a matter of agreement between the two Services concerned'.

A.H.B.  
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A.H.B.  
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encl. 5

This policy was readily agreed to by the Admiralty and was put into practice by both Departments. Both the air unit experimenting with torpedoes and the operational torpedo units were in the closest touch with the R.N. Torpedo School and exercises were carried out in conjunction with the Fleet. Such exercises had started in 1921 and continued on an increasing scale during the next four and a half years. It is unnecessary to describe each exercise and a typical example will suffice:-

Atlantic Fleet Exercise - 3 April 1923

Setting - Red Fleet (hostile) to advance up Channel to bombard Blue naval bases at Portland or Isle of Wight.

Instructions - Blue reconnaissance aircraft to locate Red Fleet so as to signal back positions to enable Blue submarines to attack Red Fleet and then to enable air torpedo attack by Blue strike aircraft.

Blue Air forces

At Cattewater - 4 flying boats  
At Calshot - 2 flying boats  
At Portland - 3 Fairey IIID

At Gosport ( 3 Walrus  
(12 Dart torpedo planes

A.H.B.  
IIK/54/10/10  
Pack No. 1

Action

The first flying boat left Cattewater at dawn darkness. The Red Fleet was first reported at 0547 hours and was shadowed up Channel to the longitude of Portland. All reports were sent to Admiral (S) who stated they were valuable but hazy weather frustrated many submarine attacks owing to low periscope visibility.

Torpedo Attack

The formation adopted by the Battle Fleet to receive attack was in a 'V' with the flagship at the centre and the wing ships two or three points before the beam with the screening destroyers close in to the capital ships. The 12 Darts took off from Gosport in two divisions with the sub-flights in succession. The divisional leaders were fitted with R/T.

Owing to the poor visibility, the leader of the 2nd Division sighted the Fleet first and went straight in. Result five hits on the Warspite, Barham and Valiant - one miss. The 1st Division attacked four minutes later. Result three hits on Repulse and Valiant - three misses.

Summary

Seven capital ships present - 12 torpedoes dropped  
Eight hits on four of the ships - Four misses  
Approximate range of firing - 700 yards

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Appendix X contains a full list of all torpedo attack exercises carried out between July 1921 and January 1926 including a large batch from H.M.S. Eagle in the Mediterranean. In all, a total of 304 torpedoes were dropped of which 156 secured hits.

The resultant opinion on the value of air torpedo attack was embodied in an Air Staff memorandum in May 1926. The opening paragraphs stated that the question of torpedo attack against capital ships was difficult to estimate. Peacetime conditions of exercise were necessarily unreal both as to the conditions under which a Fleet might have to accept attack and the opposition which the aircraft might have to face. It was claimed by the Admiralty that A/A fire could prevent an attack at very close range but they were of the opinion that this supposition was open to doubt. Even under conditions favourable to ships' fire, aircraft were likely to succeed in launching torpedoes and, given sufficient numbers and a properly organised attack, it seemed very improbable that ships by their own efforts would prevent a determined attack from being driven home. Nothing but single-seater fighter protection would prevent at least two-thirds of the attacking aircraft from dropping their torpedoes. There followed a description of attack formations, approach and release tactics. In conclusion it was estimated that when operating against capital ships under war conditions at least two-thirds of the attackers would succeed in launching torpedoes at a decisive range, and of these at least one-third, i.e. 22 per cent of the whole, would hit the target.

This view was in agreement with an earlier report by the Commanding Officer of H.M.S. Eagle in which he said:-

'It is unfortunate that no means are available for testing the value of the gun against an attack by torpedo planes. One attack, carefully analysed and applied to the results of firing at fast moving targets, gave the impression that a very small percentage of machines would be put out of action before they had functioned. The value of such attacks during Fleet action appears to be sufficiently great to merit the embarkation of as many Torpedo Flights as can be arranged without affecting efficient reconnaissance.'

The C-in-C. Mediterranean Fleet was more cautious though he too reported in January 1926 that 'results show that the aeroplane can claim a higher proportion of hits than any other type of torpedo user. At the same time it must not be lost sight of that peace conditions limit the defence more than the attack. It should not be assumed therefore that this form of attack will be invariably successful but undoubtedly the menace is great and, with a larger explosive charge in the torpedo and higher performance aeroplanes this menace will increase.'

Resulting from the torpedo attack exercises carried out during 1926 and up to July 1927 the Air Council resolved the methods of improvement under three headings:-

SECRET

A.H.B.  
ID2/11  
encl. 1

ibid.

ibid.

ibid  
encl. 3

The efficiency of the weapon - The existing Mk. VIII\* torpedo carrying a 320 lb charge head was being replaced by the Mk. X with a 500 lb head. (1) The technical efficiency of the torpedo left room for improvement although the dropping gear had been strengthened. The coming introduction of the new two-seater torpedo-bombing aircraft would enhance the efficiency of attack.

The tactics of attack - The tactic of 'scatter attack' whereby the machines kept formation and height till over the target and then dived rapidly and independently to the attack was more likely to effect surprise and ensure immunity from gunfire. Every attacker should aim at dropping within a distance of 1,000 yards from the target as attacks beyond this range had far less prospect of success. It was agreed that the existing 'one flight per ship' theory of attack was correct in that the decisive crippling of one ship would hamper a hostile fleet more than single hits on several ships.

ibid

The personal factor - This was in the opinion of the Air Council by far the most important and which if not fostered from the initial stage would never ensure success however perfect the weapon and tactics might be. The present preliminary training was, broadly speaking, adequate but it was only by the most regular and sustained practice afterwards that a pilot could maintain his skill in attack. The Council desired to stress this continual practice most strongly and they urged the Admiralty to give it their fullest consideration, as it was only after pilots joined the Fleet Air Arm that such practice could be given and it was not within the scope of the R.A.F. authorities to provide the opportunities throughout a torpedo pilot's career. Finally the Air Council suggested that the possible and at present unknown effect of gunfire upon aircraft should not be allowed to minimise the potentialities of the torpedo plane or to curtail the offensive spirit of its personnel during peacetime. It was unfortunately apparent that this hypothetical accuracy of A/A fire was leading to dangerous conclusions being drawn from peacetime training in that the aircraft were being influenced to drop at long range instead of pressing home to a pointblank 1,000 yards.

ibid in  
Appendix III

The 1927 season of torpedo attacks ended with an interesting exercise carried out by four flights of aircraft flown off a 'hostile' carrier at sea and directed at the Fleet lying in the undefended anchorage of Cromarty Firth. Torpedoes were not actually dropped but the supporting

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- (1) The previous torpedo had been in Service use since the end of 1916, and was the 18 inch Mark IX which was obsolescent by 1926:-  
Weight - 1,099 lb. Speed - 29 knots. Range - 2,000 yards  
Explosive - 250 lb.  
The standard torpedo in 1926 was the 18 inch Mark VIII\*:-  
Weight - 1,420 lb. Speed - 29 knots for 4,000 yards  
35 knots for 2,500 yards  
Explosive - 320 lb.  
The new torpedo was the 18 inch Mark X:-  
Weight - 1,430 lb. Speed - 35 knots. Range - 1,800 yards  
Explosive - 500 lb.  
Ref: A.H.B./IIA/1/4 encl. 17A.

bombing attack used bags of flour. The A/A gunnery arrangements of the Fleet were thrown into complete disorder by the simultaneous arrival of bombing aircraft and very low level torpedo attacks.

The foregoing continued to represent the Air Staff views on torpedo attack procedure by shipborne aircraft and, indeed, these never afterwards changed as far as concerned the training and employment of torpedo aircraft as the primary weapon in the Fleet Air Arm. (1) Torpedo attack exercise records are not complete after the year 1929 but up to then they were as tabulated below:-

Atlantic and Mediterranean Fleet combined results				
Year	Torpedoes dropped	Hits	Bad runs	Percentage Hits
1926	133	45	18	34
1927	173	70	37	40
1928	226	98	30	43.3
1929	351	181	34	51.6

(b) Bombing and Fighting training

In 1923 the Admiralty put forward a proposal for the development of bombing by Fleet Air Arm units of the R.A.F. In a reply the Air Staff put it on record on 8 October 1923 that if the Admiralty required an aircraft for bombing it must be a two-seater and embody proper facilities for using a bomb-sight. It was not practical to put heavy bombs in either the reconnaissance or fighter types and they opposed the production of a separate fleet-bomber to carry heavy bombs as it would mean adding a fifth type of fleet aircraft with the attendant disadvantage of adding to the congestion in carriers of a type of plane that might seldom be required. They favoured the development of the torpedo plane into a two-seater capable of carrying an alternative load of either one heavy bomb or one torpedo thereby avoiding a new class of aircraft and putting at the Fleet Commander's disposal a choice of strike weapons. Until such a plane was in production the two-seater Fairey IIID reconnaissance plane was in 1924 given a bomb load of one

- (1) That the torpedo continued in high regard by the Air Staff was exemplified in 1928 by the introduction of the shorebased torpedo-bomber for Coast Defence. This regard was unaltered up to 1932 but in that year certain qualifications were made in view of the blister protection being given to capital ships (see A.H.B./IIA/1/4 encl. 53). The change of priority to bombs for use by shorebased aircraft against ships did not come till 1935 after the series of bombing trials against the Centurion (see Chapter IX (v)) and applied only to the Metropolitan Bomber Force which was the only force capable of bringing a heavy attack to bear on major naval units. As the bomb was their weapon par excellence, it was unthinkable to give them a dual weapon with all the disadvantages of special aircraft and special training.

A.H.B.  
IIA/1/23  
encl. 57

A.H.B.  
IIA/1/41  
encl. 7

230 lb bomb.(1) Bombing training was, of course, on the same lines as that given to the Central R.A.F. bomber aircraft.

ibid  
encl. 24

On 20 June 1925 the Admiralty intimated their intention of issuing their own Training Syllabus to cover bombing and firing practices for units of the Fleet Air Arm. The Air Ministry replied pointing out that the proposed Admiralty syllabus was based on an Air Ministry training scheme which, owing to later experience, was already out of date and suggesting that a meeting be held to secure an agreed syllabus incorporating this experience.

ibid

However, the Admiralty stated that they could see no object in such a meeting as they had now modified their own suggested syllabus (OU.5358) to allow for the special conditions of attack on sea targets and they proposed to put it in operation forthwith.(2) The Air Ministry wrote on 24 September 1925 regretting the Admiralty's attitude, expressed the opinion that it would be preferable to co-ordinate all requirements in one manual, and offering certain helpful comments and corrections to the Admiralty's syllabus.

ibid

That this Syllabus was incomplete and faulty was not admitted until June 1928 when the C.-in-C. Atlantic Fleet wrote to the A.O.C. Coastal Area suggesting a general reconsideration of the training scheme. Resulting from joint conferences in the Furious the Air Member for Personnel wrote Admiral Tomkinson at the Admiralty saying that the Fleet Air Arm flights needed much more systematic training on shore owing to the limitations upon training when embarked and pointed out that OU.5358, the syllabus prepared by the Navy, would necessarily have to be completely revised.

ibid  
App.A

After a year's indecision on the matter, on 5 July 1929 it was given as the view of the C.-in-C. Atlantic Fleet that a naval scheme of training was wanted, not an R.A.F. scheme, and that most of the training could be done afloat - even that done ashore must be under the Naval C.-in-C. Nevertheless Admiral Tomkinson agreed to try the experiment of attaching Fleet Air Arm units to A.D.G.B. practice camps as recommended by the Air Member for Personnel. Following visits to R.A.F. units under training and affiliation, the Admiralty at last realised that OU.5358 would have to be completely rewritten and on 27 September 1929 the Air Ministry agreed to co-operate, help in the revision and print the new manuals. Point was added to this necessity by the publication of the results

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- (1) The introduction in 1928 of the Fairey IIIIF Mark IIIB enabled a load of two 230 lb bombs to be carried but it was not till November 1929 that the two-seater Ripon IIA torpedo plane became operational with an alternative load of one 18 inch torpedo or 1,600 lb of bombs. See Appendix VI.
  - (2) This document was remarkable in that its 17 pages avoided a single reference to the fact that the units, for whose training it provided, were part of the R.A.F. Moreover, the term 'Senior Officer of the Fleet Air Arm' was used throughout instead of 'Senior Air Force Officer' which was the term agreed to between the Services.

in the recent bombing trials against the Centurion in which the Fleet Air Arm squadron obtained a percentage of only 10 as against 18 by the A.D.G.B. squadrons.

At a further conference on 23 December 1929 it was agreed that the Fleet Air Arm flights should carry out exactly the same firing and bombing practices at the Air Force Practice Camps as the regular R.A.F. squadrons. Certain additional practices could be better carried out with the Fleet or on naval ranges and a short description of these latter was appended.

(vi) Shorebased aircraft and their operational training - 1929 to 1934

One of the problems which occupied the three Services and the Committee of Imperial Defence from 1921 onwards was that of Coast Defence. This title was something of a misnomer because the issue was really over the Defended Ports, not the coast between them. Were they to depend on defence by fixed Coast Artillery or Air Forces or a combination of both - the course of the opposing arguments do not concern us here until mid-1928, by which time it had been agreed that Air Forces had a part in such defence. A somewhat nebulous commitment was wished on to the scanty flying boat formations that were in existence for reconnaissance to give warning of the approach of any hostile seaborne threat and in July 1928 a Coast Defence Torpedo Flight was formed at Donibristle in the Coastal Area Command. They were equipped with Horsley bomber aircraft adapted to carry one 18 inch Mark VIII\* torpedo and were intended to attack any enemy major units that might threaten our defended ports. In September the Flight was strengthened and became No. 36 Squadron still at Donibristle from where continuous practice in dropping dummy and runner torpedoes was carried out.

In January 1929 the two flying boat flights at home were renumbered as Nos. 201 and 203 Squadrons (each on four Southamptons) and they together with the twelve torpedo planes formed the entire shorebased maritime force in home waters. (1) In March, No. 203 Squadron was transferred overseas to Basrah in the Persian Gulf and although a new No. 204 Squadron was formed at home it did not become fully operational until the following year. Operational exercises were few and far between. The torpedo squadron, after training attacks on single ships during May and June, took part in one Fleet Exercise in October in which their attack on the flagship (H.M.S. Nelson) resulted in four hits out six torpedoes dropped. Most of the one flying boat squadron's work was with the Anti-Submarine School at Portland and consisted of 'demonstration flying', i.e. accustoming the personnel of each Service to the aspects of the other, and to simple forms of fleet escort.

During 1930 the Home based flying boat squadrons were Nos. 201 and 204 augmented in June by the formation of No. 209 Squadron on Iris III flying boats. Eight exercises with the

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(1) Abroad, there was the renumbered No. 202 Squadron of Fairey IIID float planes at Malta, and a flight of four Southampton flying boats at Singapore (shortly to be renamed No. 205 Squadron).

ibid  
App.B

A.H.B.  
IIA/1/23  
encls. 1  
to 34

See Appendix VI  
for performance

A.H.B.  
IIA/1/4  
encl. 30

See Appendix XI

ibid

Fleet were carried out which took the form of search, shadow and reporting of the Fleet for the benefit of submarine attacks, anti-submarine escort to the Fleet, and interception patrols in co-operation with surface forces against raiders. 'Demonstration' flying was done with the A/S School and No. 201 Squadron carried out an extended cruise in the Baltic during September. No. 36 Squadron did not exercise with the Fleet but continued practice training and in September was despatched overseas to Singapore. In its place, No. 100 Squadron was transferred in November from A.D.G.B. to Coastal Area and its Horsley aircraft were adapted as torpedo planes.

ibid

In 1931, between March and May, No. 209 Squadron carried out an extensive cruise in the Eastern Mediterranean but subsequently much trouble was experienced with the Iris flying boats and the Squadron took no part in exercises at home. Nos. 201 and 204 Squadrons only took part in three Fleet exercises but carried out several anti-submarine patrol trials with the 5th S/M Flotilla and the A/S School at Portland. No. 100 Squadron co-operated with Fleet Air Arm aircraft from the Courageous in torpedo attacks on the Fleet at anchor in Cromarty Firth and further exercises at sea with the Courageous. During July and August this squadron did their annual training in bombing.

Admty letter  
M.02529/31

There had been several unfavourable reports from the C.-in-C. Atlantic Fleet on the standard of the flying boat work in Fleet exercises in 1929 and 1930. These culminated in a report after the March 1931 Exercise AV in which the C.-in-C. said that from the lessons of this exercise it was clear that there had been little, if any, advance in the efficiency of flying boat squadrons to carry out naval duties. If efficient co-operation could not be obtained under the existing system, a transfer of flying boat units to the Fleet Air Arm or to direct naval control was essential. In forwarding this report to the Air Ministry, the Admiralty said they felt that existing arrangements were inadequate and seemed unlikely to improve unless a considerably greater degree of control in the organisation and training of the shorebased units was exercised by them.

See Appendix XI

The years 1932 and 1933 saw a considerable increase in the number and scope of the various exercises. Although No. 209 Squadron continued to be out of the line for most of the period owing to troubles with the Iris V, the other two flying boat squadrons took part in twelve Fleet Reconnaissance exercises, six exercises with A/S forces, two exercises in night reconnaissance and shadowing, and a Coast Defence exercise off East Scotland. They also carried out summer cruises in Scottish water and in the Baltic.<sup>(1)</sup> As well as their normal torpedo practice training, No. 100 Squadron did three sets of squadron torpedo attacks on units of the Fleet.

In January 1934, No. 100 Squadron was despatched overseas to Singapore and in May a relief squadron was transferred to

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(1) Another flying boat squadron was formed in this period. This was No. 210 Squadron on Southamptons. They were a long time equipping and working up, and only took part in one local exercise from Calshot in 1933.

Coastal Area from No. 21 Group Inland Area. This was No. 22 Squadron who were equipped with Vildebeest torpedo-bombers. After preliminary torpedo practice training, they carried out a number of attacks against single units of the Fleet during September and October. All four flying boat squadrons took part at one time or another during the year in four Fleet Exercises, three special exercises in night reconnaissance and shadowing, a three day and night continuous flying in co-operation with the ASDIC development branch and a Coast Defence exercise in the Channel area. No. 201 Squadron also undertook a five week Summer Cruise around the British Isles.

Summary

At the end of 1934 the strength of the shorebased maritime force at home was four flying boat squadrons and one torpedo-bomber squadron - not a great increase in five years.<sup>(1)</sup> It is difficult to sum up the standard of operational efficiency in the flying boat squadrons because, except for the generalisation of co-operation with the Fleet, there was as yet no specific role apportioned. The Admiralty were plainly not satisfied with the situation. After perusal of the very scanty squadron and headquarter records which are available of this period it does appear that most of the exercises were unreal and humdrum consisting as they did of the eternal search for and reporting of a fleet whose position was tolerably well known before take off, the tedious shadowing of the Fleet, the stereotyped anti-submarine escort of the Fleet in which their only purpose was to force submarines to dive and the location of Fleet units so as to enable submarines to attack them. The work with the Portland A/S School was not much more interesting as the aircraft were never intensively trained to attack the submarine and more often than not were either spectators or used for observation purposes in ASDIC hunt exercises.

The torpedo training appears to have been good in all three of the torpedo-bomber squadrons, for instance No. 36 Squadron in 1929 and up to July 1930 dropped nearly 1,100 torpedoes in practice. The actual attack exercises against Fleet units or the Fleet itself numbered in all, eight for No. 36, ten for No. 100 and twelve for No. 22 Squadron. The average percentage of hits was a shade under 50 which compared favourably with the shipborne torpedo plane performances.

(vii) Anti-Submarine Training

(a) The influence of ASDIC

In the light of after events, the lack of serious attention given to anti-submarine training is very noticeable. There seems no doubt that the major reason for this was the development of the submarine underwater location device ASDIC

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(1) Abroad there was No. 202 Squadron, still on floatplanes, at Malta, No. 203 Squadron at Basrah, and two torpedo-bomber squadrons together with No. 205 flying boat squadron at Singapore.

ibid

Admty.  
N.S.C.17 in  
evidence to  
C.I.D.  
Sub-Committee

for use by surface craft.(1) After the war a paper was prepared by Captain A. K. Waistell, C.B., R.N., dated 12 January 1921, in which the progress in this form of submarine detection was described together with a brief explanation of the equipment. At that time, under favourable conditions, good results had been obtained up to 6,000 yards and trials against a submarine had shown that it could be detected and held at a range of 2,500 yards. Exercises regularly carried out at the Portland A/S School established that once the submarine was detected, however much it might attempt to escape, the ASDIC hunt would be successful on an average of three times out of four.

In a report contained in C.I.D. 473-B of 24 December 1923 the Admiralty were of the opinion 'that at the end of the first three months of war they would have dominated the submarine attack'. Two years later in C.I.D. 639-B of 21 October 1925 the Admiralty slightly qualified this opinion, not because of any lessening of faith in the device, but in view of the cuts in the number of new destroyers approved in the Estimates and the lack of funds to develop A/S measures in auxiliary patrol craft and to construct a class of special A/S vessels. Although they still had every hope of having the submarine menace in hand by the end of three months of war, they considered it prudent for the country to take precautions to stock up against starvation. There was no mention of any requirement for aircraft in a purely anti-submarine role.

(b) The forgotten lessons of the 1914/18 War

This was the more strange as the experiences of the War were fresh in some minds. In a lecture given at the R.A.F. Staff College during the 4th Course (1925/26) some facts were given on the subject by Squadron Leader J. K. Waugh D.S.C., who was speaking from his own war experience in the R.N.A.S. and R.A.F. Among his more striking remarks were:-

A.H.B.  
II/122  
pp. 66 to 75

1. The effectiveness of air escort or patrol cannot be judged by the number of submarines sighted or sunk. The real criterion should be the tonnage of ships sunk or damaged in the convoy escorted or the area patrolled.
2. The fact that an air unit might seldom sight a submarine was not necessarily due to their absence from the area but to the fact that they were chary of attacking when aircraft were present. It had frequently occurred that if there was a gap of a day or even part of a day in the air cover or escort, ships would be attacked in an otherwise trouble free area.
3. The most striking proof of the value of aircraft was afforded by the convoy statistics. From April 1917 till the end of the war, 312 ships were torpedoed whilst in convoy and of these attacks only two occurred when the convoy was under air escort.

- (1) The ASDIC was originally conceived by Professors Langouin (French) and Chilowski (Polish). They were members of a small committee of scientists set up in September 1917 to study the problem of underwater detection of submarines. The title of the committee was the Allied Submarine Detection Investigation Committee, hence the name ASDIC.

4. The optimum air escort was found to be two, one to search the area ahead and on the bows of the convoy up to 5 miles, the other to cover the rear sectors to prevent the convoy being trailed.
5. By the end of the war it had been accepted that relatively heavy bombs of high explosive/weight ratio were essential for attack. The desirable 500 pounder could only be carried by a few wartime aircraft types and the one in general use had been the 230 pounder of which several could be carried. They were fuzed to explode at a depth of about 40 feet and were effective against submarines on the surface and down to 60 feet submergence.
6. Although during 1917 and 1918 some 236 air attacks on submarines were made, only about 10 were thought to have been sunk with a further 15 possibly damaged. This lamentably small ratio of success could have been improved by restraining the exuberance of pilots. On sighting a submarine the pilot's sole idea was to attack as soon as possible. In most cases by the time they arrived over the position, the submarine had dived leaving only a swirl and a few air bubbles. Although the actual position of the enemy was a matter of pure guesswork this, as a rule, did not deter the pilot from releasing all bombs on the off chance of a lucky hit. Broadly speaking, only when some portion of the enemy could be seen at the moment of attack should bombs be released.<sup>(1)</sup> Had the pilot been content to wait about in the vicinity for half an hour or so it was more than probable that the submarine would re-appear when an opportunity for a successful attack would present itself. This had been confirmed in the few cases when an attack was withheld.<sup>(2)</sup>
7. In his recommendations for the future, the lecturer put firstly the continuous air patrolling over navigational focal points if shipping was running independently but as soon as convoy was instituted convoy air escort assumed overall importance and in this duty the bringing up of surface A/S forces to a sighting position was just as valuable as any air attack. Only lastly should aircraft be employed in the search for and attack on submarines in their transit areas.<sup>(3)</sup>
8. In conclusion the lecturer said that the greatest lesson he had learned was that only by the closest and most loyal co-operation between air and sea forces was it possible to meet the submarine menace and conquer it.

Such wise and precise advice did not appear in any Air Staff or Naval Staff policy, appreciation or instruction on Anti-Submarine

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- (1) It was July 1941 before this important lesson was 'rediscovered' and incorporated in Anti-U-Boat Policy. See Volume III, Chapter II (ix) of the R.A.F. in Maritime War.
  - (2) Not till June 1943 was this policy of withholding an attack and retiring out of sight for a space officially adopted. It was then known as 'Baiting Tactics'. See Vol. IV App. VI of the R.A.F. in Maritime War.
  - (3) This latter important but unpopular lesson was borne out in the 2nd World War statistics but is still not universally admitted.

C.I.D.  
1077-B  
A.H.B.  
IB/3/21

measures. Neither got any further than a generalisation that aircraft might be of assistance in reporting the presence of submarines well ahead of the Fleet. This negative approach to the subject is well exemplified in a paper on the Submarine Menace submitted by the Naval Staff to the Committee of Imperial Defence on 29 June 1931. After enumerating the heavy losses from German U-boats in the 1914/18 War, it surveyed the extent to which other nations, particularly France, were building submarines and gave a short account of the limited resources now possessed by the British Navy in countering submarine attack in a future war. Regarding ASDIC the paper pointed out that good results could only be obtained in moderate sea conditions at moderate speeds and with very well-trained personnel. There were, however, very limited numbers of vessels fitted with this apparatus and in view of the fact that when the convoy system was in operation there were an average of 23 separate convoys at sea on any one day in the Atlantic alone, of which at least one-third were in the submarine danger area, the ASDIC protection to convoys was likely to be very small. Regarding the influence of aircraft on Anti-Submarine measures, during the war Allied aircraft only effected the destruction of seven out of a total of 188 U-boats destroyed. Subsequent fleet experience pointed to the fact that the potentialities of aircraft in this respect had not materially altered but they had extended their capabilities for reconnaissance and this should help to increase the chances of attack on submarines by vessels fitted with ASDIC.

In face of such a lukewarm attitude it was hardly surprising that anti-submarine measures did not take a very high place in the curriculum of air training for the maritime squadrons of the R.A.F. Moreover, this passive outlook was reflected in the desultory progress made in the development and production of an anti-submarine bomb. Appendix VIII gives the unhappy story of this useless weapon which in 1934 was still only in limited production and quite unproven against a realistic target.

(viii) Disarmament Policy - 1929 to 1933

Towards the end of 1929 there was in the immediate offing a Five Power Naval Conference to be held in London followed by the General Disarmament Conference to be held at Geneva as soon as the Preparatory Disarmament meetings had evolved an acceptable agenda. (1) Naturally any agreement among the Five Naval Powers to alter the existing carrier tonnage limitations would affect the consequent requirement for shipborne aircraft. In the case of Great Britain the shipborne aircraft or Fleet Air Arm was an integral part of the Royal Air Force and any large increase in the existing Fleet Air Arm would result in the absorption by the Navy of an excessive proportion of our total air strength either as restricted by financial considerations or as fixed by the Disarmament Conference. In other words every aircraft granted to the Navy resulted in one less for Home Defence. It was therefore of vital interest to the Air Ministry that the authorised carrier tonnage should be

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(1) These Preparatory Disarmament meetings had been going on since 1926 with as yet no agreed basis of comparison or definition in sight.

materially reduced and it seemed to them that this might be perfectly feasible.

Below is given a table showing the carrier tonnage limits as agreed in the 1922 Washington Naval Treaty and alongside are the figures up to which each country had built by December 1929:-

Country	Washington Tonnage Limit	Present Tonnage Built or Building
Great Britain	135,000	108,000 (6 carriers)
U.S.A.	135,000	78,000 (3 carriers)
Japan	81,000	61,000 (3 carriers)
France	60,000	21,000 (1 carrier)
Italy	60,000	Nil

N.B. Originally the maximum individual carrier tonnage was 27,000 but in October 1925 Great Britain proposed 23,000 tons.

The latest Admiralty requirement specified 176 aircraft to be carrier borne leaving the remaining 65 as shipborne in capital ships and cruisers. Taking the Glorious class (22,500 tons) carrying 52 aircraft as a basis, it would require about 76,000 tons of modern carrier tonnage to accommodate these 176 aircraft so that the authorised limit could safely be lowered to, say, 78,000 tons which would be parity with the existing U.S.A. tonnage and of course would involve corresponding proportional cuts in the other three powers. There was also another point which the Air Ministry desired to stress. In the Washington Treaty there was no limit put to the construction of carriers under 10,000 tons displacement. Should any foreign power decide to construct large numbers of such small carriers the threat to our far flung ocean communications would be serious.

(a) The London Naval Conference

A letter expressing these views was sent by the Secretary of State for Air to the Prime Minister on 17 December 1929. (1) An Admiralty memorandum was circulated early in January 1930 to the London Naval Conference Committee recommending a new authorised limit of 125,000 for carrier tonnage and making no reference to an inclusion of carriers under 10,000 tons. Whereupon Lord Thompson sent another and more urgent letter to the Prime Minister dated 13 January in which he expressed his bitter disappointment at the Admiralty's failure to grasp the chance of a really worthwhile reduction in carrier tonnage and pointing out the implications of the consequent increase in Fleet Air Arm strength detracting from the Home Defence ability to defend this country against attack by European land based

(1) The Labour Party had come into power again on 8 June 1929 with Mr. J. Ramsay MacDonald as Prime Minister, Lord Thompson as Secretary of State for Air and Mr. A. V. Alexander as First Lord of the Admiralty.

A.H.B.  
IIA/1/34  
encl. 62

ibid  
encl. 63

ibid  
encls. 65  
and 66

A.H.B.  
ID2/93  
encl. 7

L.N.C.(E) 10  
also  
C.P.5 (30)

A.H.B.  
ID2/93  
encl. 13

aircraft.(1) A copy of this letter was sent to the First Lord of the Admiralty who replied on 20 January denying all the assumptions made and took up the old argument that:-

ibid

- (a) The Fleet Air Arm existed purely for Naval needs. It was required to work with the Fleet in any part of the world and its strength was fixed according to the requirements of the Fleet and nothing else.
- (b) Far from being a part of the Royal Air Force, the Fleet Air Arm was for all practical purposes an integral part of the Navy. Its aircraft were for naval work and paid for by Naval Votes and its personnel was 70 per cent naval.

L.N.C.(E) 14  
A.H.B.  
IIA/1/34  
encl. 84

L.N.C.(E) 15

ibid

ibid

Disregarding this return to the old controversy between the two Services, Lord Thompson on 1 February addressed two memoranda to the London Naval Conference Committee. In the first he advanced reasons for the definite inclusion in the permitted carrier tonnage figures of any carrier of or under 10,000 tons displacement and the consequent withdrawal of the proposal to include such small carriers in the cruiser category. In the second he deprecated the Admiralty statement in their L.N.C.(E) 10 that we could accept no reduction from the figure of 125,000 tons. Their requirement was for 176 aircraft to be carrier borne, a number calculated from the existing carrier accommodation but the First Sea Lord (Admiral Sir Charles Madden) had just foreshadowed in the Committee that an early replacement was intended of the three old carriers by modern large units, hence presumably the figure of 125,000 tons. Apart from the fact that 10,000 tons was a derisory cut after all the protestations in the cause of disarmament, he pointed out that the insistence on this figure meant that, based on the capacity of modern carriers, there might soon be a requirement for 284 shipborne aircraft to which must be added the 65 stipulated in F.S.(29)9 for capital ships and cruisers making a target programme for at least 350 aircraft. If this had been a matter solely of Naval requirements it would, he said, be less open to objection but he was bound to consider it in relation to the wider question of limitation of total air strength in the Disarmament Conference which would follow the Naval Conference. If at Geneva we could settle for parity with France, the most powerful European Air Force, we might well agree on the figure of 1,000 first line aircraft. The disproportion of 350 of these aircraft having to be in the Fleet Air Arm would seriously compromise our minimum Home Defence requirements let alone our commitments abroad. He submitted, therefore, that the maximum carrier tonnage should not be above 100,000 which gave ample scope and to spare for the accommodation and operation of all the aircraft the Admiralty required.

Notice was taken of these papers for, in a memorandum published by the Government on 4 February 1930 summarising the position to be taken by this country at the Conference,

- (1) This fear was heightened by a Cabinet decision in December 1929 that the 1923 Air Expansion Scheme was to be retarded again and involved the postponement of the completion date from 1935 to 1938. Reference: C.I.D. 1055-B - A.H.B. IB/3/21.

A.H.B.  
IIA/1/34  
encl. 90

it was stated, among other propositions, that His Majesty's Government considered that the aircraft carrier tonnage figure should include all such vessels of 10,000 tons and under, and proposed a total of, say, 100,000 tons for the British and United States navies as compared with the total of 135,000 tons authorised under the Washington Treaty with an adjustment in ratio for other nations; and that the maximum size should not exceed 25,000 tons with the age extended from 20 to 26 years.

A.H.B.  
ID2/92

In the event the London Naval Conference Agreement, which was signed at St. James's Palace on 22 April 1930, while stipulating that the description 'aircraft carrier' should include all such vessels of whatever displacement, made no alteration at all in the total authorised tonnage allocation of 135,000 for this country and America. The way was thus wide open for even larger expansion claims for Fleet Air Arm strength. However, recognising the impracticability of any immediate increase in carrier construction, (1) the Admiralty in June 1930 put forward to the Fighting Services Committee of the Cabinet a revised development programme for the Fleet Air Arm. The requirement figure was 241 aircraft by 1939 or 213 by 1936 in which year it was proposed that the matter should again be reviewed. In an explanatory paragraph it was stated that, after considering both immediate needs and national economy, it was undesirable to press for a new carrier and they did not anticipate asking for this carrier to be laid down before 1936 unless foreign programmes rendered this necessary.

(b) Disarmament quotas

With this Fleet Air Arm requirement in mind, the Air Ministry continued the never-ending task of estimating the Metropolitan and Overseas needs in arriving at a total R.A.F. strength figure which could be justified, compared and possibly form a basis for negotiation in the deliberations of the preparatory Disarmament Commission. In a periodical revision of these in July 1931 it was considered by the Air Staff that Coast Defence requirements had been underestimated. There had been no official programme of expansion since that of July 1926 but it was tacitly understood that a steady increase was reasonable towards an upper limit by 1936 of 72 flying boats and an unspecified number of torpedo bombers or other landplanes.

The actual strength in 1931 was 12 flying boats and 12 torpedo bombers at home, and 8 flying boats, 12 seaplanes and 12 torpedo bombers abroad - a total of 56 aircraft. (2) It was now thought that a more realistic figure to adopt in parity comparisons with the French Air Force would be a declared strength of:-

40 flying boats	} at home	35 flying boats	} abroad
136 landplanes		180 landplanes	

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- (1) This 'impracticability' was partly because of the world wide economic blizzard which was commencing and partly because of the June 1930 re-affirmation by the Cabinet that there would be no major war for the next ten years - C.I.D.1055B.
  - (2) Details of disposition are at Appendix V.

F.S.(29) 31  
A.H.B.  
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encl. 116  
page 3

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This was not in any sense a dated expansion programme but would form part of the total upper limit figure for the R.A.F. comparable to the agreed upper limit tonnages in the Naval Treaties. Moreover the Cabinet had on 20 July 1931 again reaffirmed that the Fighting Services Estimates should still assume that there would be no major war for ten years. In fact, the first line strength of the Maritime Air forces remained small and in February 1932, at the time of the opening of the Disarmament Conference at Geneva amounted to only:-

C.I.D.1058-B  
A.H.B.  
IB/3/21

At home	Abroad
16 flying boats	8 flying boats
	12 floatplanes
12 landplanes	12 landplanes
96 F.A.A. aircraft	62 F.A.A. aircraft

It was, however, in February 1932 that the Chiefs of Staff Sub-Committee in reviewing Imperial Defence Policy drew a sombre picture of the appalling weakness and unreadiness to which our Defence Forces had been reduced by the cumulative results of all the 'No war for ten years' rulings and they recommended that this pernicious assumption should be cancelled. This had particular reference to our weakness in the Far East with emphasis on the Singapore commitment. The recommendation was accepted by the C.I.D. in March 1932 but was not endorsed by the Cabinet for another eleven precious months.

C.I.D.1082-B  
ibid

(c) Clashes with the Admiralty

Not unreasonably, even in the face of the economic blizzard still sweeping the world and of a recent recommendation by the Cabinet Committee on Disarmament that negotiations be opened with the United States to prevent competition in numbers of shipborne aircraft, the First Lord of the Admiralty(1) issued a memorandum in which a minimum Fleet Air Arm strength of 400 aircraft was asked for by 1936. This request, he said, represented the tactical requirements of the fleet and was 'an absolute and not a relative factor'.

A.H.B.  
ID/3/6

Lord Londonderry queried the whole paper as, apart from its effect on the R.A.F. strength negotiations then starting in the Geneva Disarmament Conference, the claim on the face of it was irrespective of whatever standard was put forward by the United States or Japan, both of whom were about to be asked by our Government to reduce their carrier tonnage. Although the 400 aircraft might be within the carrier capacity allowed us by the Naval Treaty, it very greatly exceeded the number that could be accommodated in the Fleet as at present constituted or was likely for many years. There had been, he said, no development in foreign programmes since June 1930 which called for any enlargement of the programme which the Admiralty were then prepared to accept.

A.H.B.  
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- (1) On 24 August 1931 the Labour Government had resigned and a Coalition Government was formed, still under Ramsay MacDonald but containing many Conservative and Liberal members. At this time the First Lord was Sir Bolton Eyres-Monsell and the Secretary of State for Air was Lord Londonderry.

The mere building up to the exact authorised tonnage was financially ruinous and might become disastrous to our position if it resulted in all the chief Naval Powers doing the same.

The First Lord replied on 19 April 1932 and laid bare one of the constant causes for disagreement between the two Departments. He said that the insuperable obstacle was the assumption by the Air Ministry that we must combine a global limitation figure for all categories of aircraft that would not be in excess of that of France, with parity in the metropolitan and immediately adjacent areas. Naval defence was concerned not with France alone but with Naval Powers all over the world and the needs of the Fleet in shipborne aircraft were determined by considerations of naval strategy and tactics which could not give way to considerations of the quantitative limitations of other categories of aircraft.

However, once again the demand for a large increase in Fleet Air Arm strength was not pressed further as in spite of the gloomy and well-founded forebodings of the Chiefs of Staff Sub-Committee and the strong C.I.D. recommendation to cancel the 'Ten Year Assumption' the Cabinet ruled that the parlous state of the country's finances were even more serious than the existing military risks. Partly on this account and partly because it was not desired to prejudice the work of the Disarmament Conference by any increase in our own forces, no broad investigation of our pressing defence requirements was undertaken.

The other constant cause of disagreement made its reappearance on 30 July 1932. This was an accusation by the First Lord that certain measures which had recently been settled in conference affecting the conditions of entry, service and promotion in the Fleet Air Arm had at a stroke been denounced by an Air Ministry demand that the agreed temporary 50 per cent representation in the ranks of Squadron Leader and Wing Commander until 1936 should be made a permanent arrangement and extended down to Flight Lieutenants. The substitution of a 50 : 50 ratio for the existing 70 : 30 division was quite unacceptable to the Admiralty.

Lord Londonderry wrote back on 4 August that, far from the Air Ministry's proposal being new or revolutionary, the Admiralty's counter-proposal that they should retain 70 per cent of Flight Lieutenant posts for naval officers was a clear breach of the agreed basis for the above conference discussions. This basis had been arrived at by an Air Council letter of 1 March 1932 expressing a hope that the Admiralty would eliminate any continuance of the contention that the 70 : 30 ratio was a predetermined 'must' and to which the Admiralty had replied on 7 April that they agreed to the problem being examined from a general policy point of view rather than the maintenance of any fixed ratio of naval officers in the Fleet Air Arm. Lord Londonderry went on to say that the whole matter stemmed from the Balfour Committee findings of 1923 when the Admiralty had promptly claimed the upper limit (70 per cent) which that finding had tentatively mentioned as only a possible figure. Ever since, the Air Ministry had maintained that this percentage was not a satisfactory basis for the manning of the Fleet Air Arm. They had been supported in their view by the Colwyn Committee in 1925 who recommended that the naval ratio should be reduced to 30 per cent and by Mr. Baldwin in 1926 who appealed to the Admiralty in their own interests to agree to a lower ratio. He had hoped, therefore,

A.H.B.  
ID/3/6

C.I.D.1087-B  
A.H.B.  
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ID/3/6

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ibid

that the recent conference implied willingness to discuss the 70 : 30 ratio which had so long obstructed agreement between the two Departments and the settlement of any permanent policy. He also mentioned in his letter other concessions by the Air Ministry since 1926 such as the granting of 50 per cent of posts in all carriers and shore establishments, and the promotion of naval officers to Air Force rank at much lower ages than their Air Force colleagues in the same units. The offer of 50 per cent to the Air Force quota in the higher ranks only until 1936 was for far too short a time. It must be fixed over a period long enough to allow the human individuals affected to work out their careers under it.

Further deliberations continued in the combined conference until December 1932 when settlement was reached on details of entry, promotion and length of service for naval officer pilots. It was also agreed that a limited number of R.A.F. sergeant pilots would be employed in the R.A.F. quota and that carrier posts should continue to be on a 50 : 50 ratio but that there should be 100 per cent allocation of naval pilots to all the catapult flights in capital ships and cruisers.

(ix) The growing German menace forces belated rearmament

Cabinet 9 (33)  
conclusion 3

Early in 1933 Japan invaded the Chinese province of Jehol and gave notice of withdrawal from the League of Nations. In February 1933, at long last, the Cabinet definitely ended the 'Ten Year Rule' and endorsed the previous policy of the Committee of Imperial Defence 'that a start should be made in providing commitments which are purely defensive including the defence of bases, first priority being given to requirements in the Far East'.

C.I.D.  
1113-B  
A.H.B.  
IB/3/22

In June 1933, the C.I.D. Chiefs of Staff Sub-Committee in their annual review of Imperial Defence drew particular attention to the increasing rapidity of German re-armament and as far as our Air Forces were concerned they recommended the hastening of the completion of the Air Expansion Programme of 1923 as the Home Defence Force was still short by ten squadrons of the 52 then approved. But still nothing was done by the Government.

Meanwhile the Disarmament Conference, which had opened at Geneva on 8 February 1932, (1) sowed the seed of its own ultimate failure by the August decision to allow Germany to rearm on the grounds that only if she received this permission would she subsequently submit to be controlled by disarmament proposals. Further set-backs had resulted from Japan's onslaught on China later in 1932, the obvious failure by the League of Nations to impose sanctions on her and the increasing discredit into which this body was rapidly falling. However, the Conference pursued a frustrated way for another year bogged down in hopeless attempts to achieve numerical

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(1) It must be remembered that prior to this opening there had been six long years of Preparatory Commissions in order to obtain an agenda agreeable to the 46 polyglot nations who insisted on their voice being heard. For the full story of these and the Conference itself see A.H.B.IIA/1/34 Parts 2 and 3.

limitation of international air strength to a reasonably low level and finally foundering on impossible suggestions to prohibit all bombing from the air, and the increasingly aggressive tone by Germany under the National Socialist Party led by Herr Hitler, culminating in Germany's withdrawal in October 1933 with notice of resignation from the League of Nations.

The time was overdue for a thorough review of our commitments as a whole and of our means for meeting them. At last, on 15 November 1933 the Cabinet appointed a Defence Requirements Committee to examine the position and submit a programme for remedying the deficiencies existing in the Services which had resulted from the long and crippling imposition of the 'No War for ten years' rule.

Towards the end of December, the Admiralty submitted their construction programme for the year 1934 to the Defence Requirements Priorities Sub-Committee. This included provision for the laying down of a large carrier together with additional shore accommodation and training facilities for its aircraft. They intended that the 72 aircraft required for the carrier should be in addition to the existing programme strength. For some unaccountable reason the paper was not circulated to the Secretary of State for Air or the Air Ministry.

The Under-Secretary (Sir Philip Sassoon), acting for Lord Londonderry absent in India, wrote on 11 January 1934 saying he had heard of this paper and asking the First Lord to hold his hand until his Department had had a chance of discussing the implications from the air supply angle. The First Lord replied that he was quite unable to accept this suggestion. His remarks followed very closely those of April 1932 when much the same situation had arisen except that now both the United States and Japan were steadily building carriers up to the Treaty limits. A somewhat acid exchange of letters followed in which each contradicted the opinions of the other and ended with the inevitable remark that the Fleet Air Arm was an essential part of the Royal Navy, not an integral part of the Royal Air Force.

On his return from India in February 1934, Lord Londonderry supported the stand taken by Sir Philip Sassoon that the Air Ministry should certainly have been consulted before the demand for the 72 aircraft became a Cabinet Paper and wrote to the Prime Minister about it. He (Mr. Ramsay MacDonald) expressed surprise that there should be such open disagreement between the political heads of Departments when from his enquiries he found that no such differences existed in the Chiefs of Staff Sub-Committee on the subject. In his reply Lord Londonderry said that this occasion was by no means the first difficulty he had had both with the Admiralty and the War Office. He still maintained that the Admiralty ought never to have put their paper before a Cabinet Committee without the Air Ministry being informed. In the event the Naval programme was approved but the Committee took note that the provision of a new carrier would involve future extra expenditure by the Air Ministry.

On 5 March 1934, the Defence Requirements Committee presented their report for meeting the deficiencies in which they considered it of first importance that the 1923 Home Defence Air programme of 52 squadrons should be completed as soon as possible in order to meet the German menace. In addition they recommended a five year programme to make good

Cabinet 62 (33)  
Conclusion 5(b)

C.P.311(33)

A.H.B.  
ID/3/6

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ibid  
and ID2/103

ID2/102  
encls. 1 to 4

our worst deficiencies whereby another 40 new squadrons would be created.(1) They also said that there still remained insufficient flying boats at home for convoy duties or defence against submarines, for reconnaissance in co-operation with the Navy, and insufficient fighters to assist in the defence of home ports and inland cities in the northern half of England. To meet these requirements a minimum of 25 squadrons were necessary over and above the 40 already mentioned.

This report was examined by a Ministerial Committee then considering the requirements of Imperial Defence and they thought it important enough to anticipate their Final Report by submitting immediately to the Cabinet that portion which dealt with Air Defence. In this they endorsed the need for a special Five Year Programme of expansion to make good the worst deficiencies amounting to 33 squadrons for Home Defence, 4½ squadrons for the Fleet Air Arm and 4 squadrons for the Far East. Together with the 1923 Expansion Programme this would give by April 1939 an R.A.F. first line strength of 1,252 aircraft, of which 960 would be at home and 292 overseas, and a Fleet Air Arm of 213 aircraft. This was known as Air Expansion Scheme A,(2) and was to be completed by 31 March 1939.

Although the necessity for a further 25 squadrons for naval co-operation and the extension northward of Home Defence was recognised, the country's finances and aircraft production potential could not meet this requirement during the next five years, but in order to test the possibility of interchanging Home Defence units with Fleet Air Arm units in case of emergency they recommended that the Admiralty and Air Ministry should concert experiments in training two or more squadrons from each of these forces in the dual role and to report in the course of the next two years to the C.I.D.

C.P. 193(34)  
and  
C.I.D.1148-B

This Report was accepted by the Cabinet and the substance of the above special programme was announced in the House of Commons on 19 July 1934. Henceforth it was openly accepted that our defence preparations were to be planned with Germany as the probable enemy.

- (1) These squadrons consisted of 88 aircraft, including 16 flying boats, for the Far East, 110 aircraft for the Home Defence Force and 51 aircraft to make good the existing deficiency in the Fleet Air Arm with provision of a further 192 aircraft for future naval construction during the years 1935 to 1940 (144 for two new carriers and 48 for new capital ships and cruisers).

- (2) Metropolitan Air Force  
Fighter - 28 (5) Sqdns. - 336 aircraft  
Bomber - 41 (8) Sqdns. - 476 aircraft  
Army Co-op - 5 Sqdns. - 60 aircraft  
Coastal G.P. - 4 Sqdns. - 48 aircraft  
Torpedo bomber - 2 Sqdns. - 24 aircraft  
Flying boats - 4 Sqdns. - 16 aircraft  
N.B. Bracketed figures indicate how many were non-regular auxiliary squadrons.

Overseas Air Force  
All types, including flying boats - 27 sqdns. - 292 aircraft

Fleet Air Arm  
At home and overseas - 16½ sqdns. - 213 aircraft.

CHAPTER VII

RENEWED INTER-SERVICE CLASHES AND ACCELERATED REARMAMENT

1934 TO 1936

(i) Interchangeability of aircraft and manning controversy

Up to the end of 1933 all Home Defence proposals were based on the possibility of war with France but the public and the House of Commons had found it difficult to believe in any great danger from this quarter. This feeling and the financial stringency had resulted in the long reign of the 'No war for ten years' rule. In consequence there was failure to provide by 1934 more than 42 of the 52 Home Defence squadrons considered necessary in 1923. However, six months of a possible German threat had already resulted in approval for an extra 33 squadrons. With the demise of the Disarmament Conference there were only remote chances of international numerical limitation of air forces and consequently from this angle all Air Ministry opposition to Fleet Air Arm expansion was at an end. But there remained the curb on our total air strength imposed by considerations of national finance and the limited output of the aircraft industry. There also remained the constant undercurrent of Admiralty dissatisfaction with the system of Fleet Air Arm administration by the Royal Air Force.

The reasons underlying the Government interest in the feasibility of a dual role by units of the Fleet Air Arm and the Home Defence Force were that they were in doubt as to whether the Five Year Programme was sufficient to make good our deficiency in Home Defence, and whether it would be politically and financially practicable to meet the cost unless there was some degree of interchangeability between Fleet Air Arm and Home Defence squadrons. Discussions on this latter subject took place during July 1934 in a Ministerial Sub-Committee on the Allocation of Air Forces where it was finally decided that, though possibly F.A.A. aircraft could be used in Home Defence, the converse was not possible. However, the Air Ministry did not accept this opinion and believed that a part of the Home Defence personnel could be adequately trained to provide a part of the complement of Carriers, in the Fighter and Torpedo squadrons. They agreed that an experiment in the use of F.A.A. squadrons for Home Defence should be tried but thought that a similar experiment in the use of Home Defence personnel in the F.A.A. should also be tried.

A.H.B.  
ID2/102  
5th conclusions

ibid  
encl. 11

During the course of the discussions in the Sub-Committee the subject of manning and reserves received attention. Regarding the question of R.A.F. reserves, the members thought it better in Parliamentary pronouncements to publish the increase in the number of first line squadrons while hiding the fact that there was no war reserve backing in preference to only adding a few squadrons but using the money voted to provide a proper reserve backing. Hence the start of the 'window dressing' policy which was the feature of so many of the subsequent Expansion Schemes. But this policy was no solution to the conditions peculiar to the Fleet Air Arm with its mixed Naval and Air Force personnel.

ibid  
3rd conclusions

This problem was made more difficult by the intrusion of an old controversy. The first sign had come in March when the Admiralty had reopened their claim for the entry of lower

A.H.B.  
IIA/1/41  
encl. 31

deck rating pilots into the Fleet Air Arm. Consideration of this subject had been delegated to an inter-service conference scheduled for July but the publication of the Government's Expansion Scheme A had caused a postponement. After making a number of proposals dealing with Fleet Air Arm manning, training, organisation and reserves the Air Ministry suggested in October that this postponed inter-service conference might not only discuss the naval rating pilot system but look into the interchangeability of squadrons proposition because both had an intimate bearing on manning and training methods.

ibid

This brought a sharp reply on 12 November 1934 from the First Sea Lord (Admiral Sir Ernle Chatfield) to the effect that he could not agree to the rating pilot question being dealt with in conjunction with an entirely different matter of almost national strategy. He preferred to discuss a plain interchange of one or two squadrons to see how they got on in favour of any arguments on manning, training and organisation. These latter merited separate treatment as in the Admiralty view the existing manning arrangements led to inefficiency owing to the much shorter period of attachment of junior R.A.F. officers to the Fleet Air Arm than the original four years contemplated in the 1923 Balfour Report. The constant changes of R.A.F. personnel with their resulting lack of naval experience interfered considerably with Fleet training and put a brake on progress. However, he agreed that a conference to discuss the exchange of squadrons trial was necessary and suggested it should take place at an early date.

C.O.S. 374  
and  
C.I.D.  
1179-B

This was replied to by the C.A.S. (Air Chief Marshal Sir Edward Ellington) on 3 December in which he confined himself to the question of the dual role and agreed that a trial exchange of two or more squadrons from each force might be carried out during the summer of 1935. The necessity for this trial was largely discounted at the end of April 1935 by a statement in the Chiefs of Staff Sub-Committee that 'there can be no idea of counting on the Fleet Air Arm aircraft, even though they may be stationed at home, as an integral part of the R.A.F. Metropolitan first line strength'. Accordingly, the Fleet Air Arm was henceforward no longer reckoned as part of the Royal Air Force in parity comparisons with the German Air Force.

A.H.B.  
ID2/103

Regarding the naval rating question, this continued to rankle between the two Departments and was coupled with rising dissatisfaction by the Admiralty with the terms of service of R.A.F. pilots in the Fleet Air Arm. Moreover the Admiralty were having very great difficulty in recruiting sufficient naval officer pilots to compete with the authorised expansion in the Fleet Air Arm and the whole subject was becoming a cause of acute disagreement between the two Departments. A memorandum was sent by the First Lord to the Secretary of State for Air on 20 May 1935 in which he said that efforts to resolve this problem had failed over the recent months, evidently due to a fundamental difference of view. The Admiralty held that the Fleet Air Arm was a vital and integral part of the Royal Navy; the Air Ministry, on the contrary, held that it was part of the Royal Air Force allocated for duty with the Fleet and that matters affecting its composition, administration and development must be regarded primarily from the standpoint of the Royal Air Force. Another instance, he said, of this fundamental difference was the curtailment by the Air Ministry of the time of service of the R.A.F. quota of pilots in the

Fleet Air Arm. The 1923 Balfour Committee had reckoned it should be four years, the Admiralty thought it should now be far longer but in fact it had been gradually reduced and now only averaged 23 months. There was no doubt that with the present difficulties the Naval personnel was unhappy as they had to serve two masters and the individual's career during an important part of his life was felt to be in the hands of another Department - the result was lack of volunteers. In these circumstances he had no option but to ask for the appointment of a Cabinet Committee to enquire into the conditions arising out of the dual control of the Fleet Air Arm and to make early recommendations with regard to the employment of naval rating pilots and the term of service of R.A.F. pilots in the Fleet Air Arm.

ibid

However, in June 1935 there was a reshuffle of posts in the Coalition Government and Lord Londonderry was replaced as Secretary of State for Air by Sir Philip Cunliffe-Lister with Mr. Stanley Baldwin as Prime Minister instead of Mr. Ramsay MacDonald. In view of these changes the First Lord's memorandum with its request for a Cabinet Enquiry was not circulated to the Cabinet but an official answer to all the charges was prepared at the Air Ministry ready if and when the subject was reopened.

ibid

(ii) Accelerated R.A.F. Expansion Programmes - 1935 and 1936

Meanwhile at the end of March 1935, Sir John Simon and Mr. Eden had held very unsettling conversations in Berlin with Herr Hitler. He had informed his visitors that Germany had already reached parity with Great Britain in air strength and intended in the future to achieve parity with the French Air Force in France and North Africa. These forces were assessed at an approximate total of 2,000 aircraft. The Air Staff were sceptical whether this was the immediate target for Germany's expansion but they considered that a force of 126 squadrons of 1,500 first line aircraft could reasonably be achieved by April 1937 though it would be 1939 before this force could be put on a war footing as regards training, equipment and reserves.

C.P.69(35)

C.O.S.373  
15 Apr. 1935

To counter this new threat the Air Staff proposed that the R.A.F. be expanded to 1,332 first line aircraft by April 1939. This was referred to the Ministerial Committee on Defence Requirements but they did not consider this as sufficient and appointed a sub-committee under the chairmanship of Sir Philip Cunliffe-Lister(1) to prepare a revised and accelerated programme. It was considered that the politically binding pledges on 'air parity' given by Mr. Baldwin (as Lord President of the Council) on 8 March and again on 28 November 1934 would need to be honoured.(2)

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- (1) This was before he became Secretary of State for Air.  
(2) The pledge given on 8 March 1934 was:-  
'In conclusion I say that if all our efforts fail and it is not possible to obtain this equality in such matters as I have indicated, then ..... this Government will see to it that in air strength and in air power this country shall no longer be in a position inferior to any country within striking distance of our shores.'  
Ref: Hansard Col. 2078.

Cabinet (29) 35  
May 1935

The redrafted programme, which came to be known as Expansion Scheme C, was designed to provide a Metropolitan Air Force of 123 squadrons of 1,512 first line aircraft by 31 March 1937. Details are given in footnote (1). There was no increase suggested for the Overseas Air Force or the Fleet Air Arm but it was noted that the latter which then numbered 174 aircraft should, after achieving its authorised 213 aircraft by 1937, be subsequently increased to 277 by April 1939.

In an endeavour to keep Germany's naval rearmament in check an Anglo-German Naval Agreement was signed on 18 June 1935 under which Germany was permitted to build up to 35 per cent of the British Fleet in each category of surface ships and to 45 per cent in submarine tonnage by the end of 1942. These ratios were subject to certain transfer rights as between one category and another which were set out in detail in an exchange of Notes which followed. Under para. 2(f) Germany later obtained the contingent right to parity in submarine tonnage.(2)

Soon after the signing of this Naval Agreement, the Defence Requirements Committee was invited by the Cabinet to re-examine the Defence Forces Expansion Programmes in the light of the more general German rearmament. Their Report was presented on 24 July 1935 in which, after recording the gloomy international situation, they recommended a further speed-up in all three Service programmes regardless of cost so as to be in a reasonable state of preparedness for war early in 1939 and they requested further time in which to work out precise details. These were completed by November 1935 and as far as the Air Force was concerned amounted to the completion of the already authorised expansion programme by 1937 with the addition of one more squadron and increases in squadron establishments at home, ten more squadrons for deployment abroad, a much increased entry of pilots to build up the totally inadequate reserve, and similar increases in reserve aircraft, stores and other equipment. This would give us an Air Force of 2,204 first line aircraft by 1939 of which 1,736 could be classified as Metropolitan Air Force. Regarding the Fleet Air Arm, the Admiralty stated that development plans made it necessary to ask for an increase in the April 1939 figure from 277 to 312 and by 1942 to 504 aircraft. In addition they required a

D.R.C.27

D.R.C.30

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(1)	Fighters	- 35 ( 5)	Squadrons -	420 aircraft
	Bombers	- 68 (11)	Squadrons -	816 aircraft
	Army Co-op	- 5	Squadrons -	90 aircraft
	Coastal G.P.	- 7	Squadrons -	126 aircraft
	Coastal T.B.	- 2	Squadrons -	24 aircraft
	Flying Boats	- 6	Squadrons -	36 aircraft
				<hr/>
	Total	-123	Squadrons -	1,512 aircraft

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N.B. The numbers in brackets indicate how many squadrons were non-regular auxiliary.

- (2) Germany gave her intention to complete by the end of 1939:- One new 35,000 ton battleship, three heavy cruisers, one aircraft carrier, sixteen large destroyers and forty submarines in addition to two 26,000 ton battlecruisers and one light cruiser then under construction. The existing German Navy included three 10,000 ton pocket battleships, seven light cruisers, twelve large and twelve small destroyers, and twenty-four small submarines.

modern shore establishment of their own to accommodate disembarked aircraft while under training.

Cabinet(10) 36

The figures of D.R.C.27 were considered by the Cabinet Committee on Defence Policy and approved on 25 February 1936 as Air Expansion Scheme F.(1)

C.O.S.442

In March 1936 the international situation took a turn for the worse, Germany re-occupied the Rhineland and it became apparent that, with much of our slender maritime defence force deployed in the Mediterranean against an aggressive Italy engaged in the Abyssinian War, the meagre remnant at home was utterly incapable of meeting any threat from an equally aggressive minded Germany. It was stated in C.O.S.460(J.P.) dated 29 April 1936 that, among other deficiencies in air co-operation with the Navy, there were no aircraft available in this country which could be allotted solely for coastal reconnaissance against enemy surface craft other than six to eight flying boats. All further requirements for Naval Co-operation would have to be found from the resources of the Fleet Air Arm.

A.M. S.37140  
encl. 15A  
and  
S.32145  
encl. 17A

In May 1936, the War Organisation Committee introduced what was called the Western Plan which applied to the mobilisation and disposition arrangements for a possible major war in Europe as contrasted with those for the Mediterranean crisis. Emergency plans were related to consecutive periods - Phase I was April to October 1936, Phase II was October 1936 to April 1937, Phase III was April to October 1937 et sequetur.

(iii) The formation of Bomber, Fighter and Coastal Commands, 1936

A.M. S.35318  
Part I  
encl. 6B

From the point of view of the general organisation of the Royal Air Force the large increases contemplated by Expansion Schemes C and F necessitated in particular the abolition of the old Air Defence of Great Britain Command and the separation of the offensive or bomber organisation from the defensive or fighter force. Some concern was also expressed that unless the Bomber and Fighter forces were placed under separate Commanders-in-Chief the need for an adequate Striking Force might be subordinated to the more pressing claims of defence. It was, therefore, decided that there should be instituted Bomber and Fighter Commands each with an Air Officer Commander-in-Chief responsible directly to the

(1) Fighters	- 30 ( 5)	Squadrons -	420 aircraft
Bombers	- 68 (11)	Squadrons -	990 aircraft
Army Co-op	- 11 ( 4)	Squadrons -	132 aircraft
Coastal G.R.	- 7	Squadrons -	126 aircraft
Coastal T.B.	- 2	Squadrons -	32 aircraft
Flying Boats	- 6	Squadrons -	36 aircraft
Metropolitan Total	- 124	Squadrons -	1,736 aircraft
Overseas	- 37	Squadrons -	468 aircraft of all types
R.A.F. Total	- 161	Squadrons -	2,204 aircraft

N.B. The numbers in brackets indicate how many squadrons were non-regular auxiliary.

Air Ministry. This specialisation meant that the new organisation of the Royal Air Force was to be built up on a functional basis. As a first move towards this, the former 'Area' formations of the A.D.G.B. were replaced in January 1936 by 'Groups' and at the same time the Inland and Coastal 'Areas' were elevated into Commands but still under only an Air Officer Commanding.

ibid  
encl. 8A

During subsequent months measures were taken to provide for the decentralising of administrative responsibilities within the new framework. These, with the exception of personnel questions, were now to be centred at Command Headquarters and made the concern of an Air Officer Administration who was to relieve his C.-in-C. of as much administrative work as possible thus enabling C.s-in-C. to devote more time to the strategical, operational and training aspects of their Commands. At each operational Command Headquarters there was also to be a Senior Air Staff Officer whose duty was to assist the C.-in-C. on the more important operational questions which fell outside the competence of a Group Commander. The exception to the general principle underlying the reorganisation was that the administration of personnel was to be vested in the Group Headquarters on the grounds that the operational efficiency of units depended largely on the discipline and training of personnel. Maintenance Liaison Officers were appointed to the staff of the Group Headquarters to advise their Commanders on maintenance, supply and works problems affecting the units within the Group. On general administrative questions, stations and units were to communicate directly with their Command Headquarters and on personnel matters with the Groups who were empowered to deal directly with the Air Ministry. This organisation was brought into force in August 1936 by the appointments of Air Officer Commanders-in-Chief to the new Bomber, Fighter and Training Commands.

ibid  
encl. 39A

See App. V for  
the dispositions  
in Dec.

The case of Coastal Command was different in many ways. Under Expansion Scheme C provision was made for seven General Purpose(1) squadrons with an initial equipment of 18 aircraft each, two Torpedo Bomber squadrons of 12 I.E. each and six Flying boat squadrons of six aircraft each. The two torpedo bomber squadrons were intended, in war, to come under Bomber Command but apart from that the new Coastal Force would consist of 13 squadrons of 162 aircraft instead of the eight squadrons of 64 aircraft provided by Expansion Scheme A. It was clear that the former organisation of Coastal Area would be incapable of dealing with the greatly increased resources, furthermore the functional basis would not satisfy the geographical claims for co-operation with the Navy.

In spite of this reasoning, in February 1936 the Air Ministry Director of Organisation proposed the undermentioned Scheme for the Command:-

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(1) These squadrons were renamed General Reconnaissance squadrons in August 1935.

A.M. S.35818  
Part I  
encl. 10A

A.O.C.-in-C.	-	Air Marshal
A.O. Administration	-	Air Commodore
S.A.S.O.	-	Air Commodore
S.E.S.O.	-	Group Captain

<u>No. 15 Group</u>	<u>No. 16 Group</u>	<u>The F.A.A.</u>	<u>No. 17 Group</u>
Six F/B Sdns.	Seven G.R. Sdns. Two T.B. Sdns.	(except for shore training)	F.A.A. Shore training and training estab- lishments at Lee- on-Solent, Gosport, Calshot and Thorney Island.

N.B. The Group Commanders were to be Air Commodores, each a S.A.S.O.

ibid  
encl. 26B

There was some doubt expressed by both the Deputy Chief of the Air Staff and the Command H.Q. Staff whether the above functional grouping would be preferable to a geographical grouping, particularly as the organisation of the Groups would need to be related to local Naval Commands and that, in war, the Group Headquarters would have to operate both landplane reconnaissance and flying boat squadrons. After considerable discussion it was decided in March 1936 that the functional plan should be adopted but later it was found impossible, owing to personnel shortages, to form three Groups simultaneously. The Flying boat squadrons were, therefore, amalgamated into No. 16 Group which was formed at Lee-on-Solent on 1 December 1936.

See Chapter XI  
(iii) for full  
account

The Deputy Chief of the Air Staff (Air Vice-Marshal Courtney) only accepted this arrangement with reluctance. His opinion was that at least two operational Groups should be formed in peacetime, each organised to throw off another one in war, thus provision would be made for four Groups, corresponding to the number of local Naval Commands. This represented the 'ideal' requirements for Coastal Command Group organisation. If it had been done, many of the difficulties experienced later during the Munich crisis would not have been experienced.

As it was, by the end of the year 1936 there was one operational Group Headquarters (No. 16 Reconnaissance), (1) one training Group Headquarters (No. 17 Training) and the Command Headquarters, all located at Lee-on-Solent. The A.O.C., who had become A.O.C.-in-C. on 14 July 1936, (2) turned

- 
- (1) No. 16 Group consisted of:-  
Three G.R. squadrons of Ansons located at Bircham Newton  
Two T.B. squadrons of Vildebeest located at Donibristle  
Five F/B squadrons of Londons, Singapores, Southamptons  
and Scapas located at Calshot, Felixstowe, Mount Batten  
and Pembroke Dock. See Appendix V.
- (2) Air Marshal Sir Arthur Longmore, who had been A.O.C. Coastal Area since 1 October 1934, was made A.O.C.-in-C. Coastal Command on 14 July 1936. Six weeks later he was relieved by Air Marshal P. B. Joubert de la Ferte on 1 September 1936.  
Ref: Loose Minute A.R.8(b) of 9 Oct. 1958.

over to the new staff organisation officially on 1 January 1937. The administration and training of the Fleet Air Arm units remained directly under the Headquarters of Coastal Command as also did an R.A.F. detachment at Bermuda.(1)

(iv) The Admiralty/Air Ministry clash over the manning of the Fleet Air Arm

The summer months of 1935 had brought no solution to the controversy over the questions of naval rating pilots and terms of service for R.A.F. pilots in the Fleet Air Arm. To this was added further disagreement as to how reserves necessary to back the first line F.A.A. strength were to be built up. All this boiled up into a complaint by the First Lord over the amount of control which the Admiralty could exercise over the conditions and manning of the Fleet Air Arm followed by a suggestion that a Cabinet Minister should hold an enquiry into the validity of the 1923 Balfour Agreement. The Secretary of State for Air immediately protested that the reopening of the principles of this Agreement was a question that both the late and the present Prime Minister refused to allow even to be brought before the Cabinet. If what was desired was a consideration of how on matters of detail the Balfour recommendations could be most satisfactorily worked, that was a matter he had long ago suggested ought to be fully and frankly discussed between the Services.

A.H.B.  
ID/3/6

A meeting took place on 1 October 1935 between the Political and Service heads of the two Departments with Sir Maurice Hankey in the Chair at which the questions at issue were discussed in great detail. There was, however, still no agreement, in fact the naval view was that the whole situation was now impossible and the system rapidly breaking down. It was, therefore, left that in the ensuing weeks the Air Ministry would investigate to what extent the period of attachment of R.A.F. officers to the F.A.A. could be increased; to determine what was the existing position regarding reserves; and to make proposals for improving the present position.

M.P.IA  
A.H.B.  
ID2/103

On 1 November the Secretary of State for Air wrote the First Lord a long letter on the above points and making suggestions on other matters which he thought the two Departments ought to discuss. A further meeting took place on 22 November, again under the chairmanship of Sir Maurice Hankey. The subject was confined to the problem of reserves and after discussion it appeared that the only way to remedy the deficiencies was to accept naval rating pilots or increase the R.A.F. ratio of officer and airmen pilots. In either case the result would be that the number of naval officers in the F.A.A. would fall below the Admiralty claimed figure of 70 per cent. It was pointed out by the Air side that this ratio was of the Admiralty's choosing. If it was uneconomic for building up a reserve, it was for them to settle on an economic figure and leave the R.A.F. to provide the balance. But it was quite obvious that the root of the matter was the Admiralty's profound dissatisfaction with the entire system.

ibid

M.P.2  
A.H.B.  
III/42/1

During the next few months it became plain that no inter-departmental discussion was likely to arrive at any lasting

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(1) For the catapult aircraft in H.M. cruisers on the station.

A.H.B.  
ID/3/6

agreement and on 21 April 1936 the First Lord wrote to the newly created Minister for Co-ordination of Defence(1) outlining the points at issue and asking him to carry out an early enquiry into the whole matter. The Secretary of State for Air, while expressing agreement to this enquiry, stipulated that it must not include any discussion of the old separate F.A.A. controversy. Accordingly early in May 1936, with the concurrence of the Prime Minister, Sir Thomas Inskip was appointed to hold an enquiry and investigate the whole question of F.A.A. manning and reserves.

A.H.B.  
ID2/104(A)  
encl. 5

(v) The first Inskip Enquiry - 1936

ibid  
encls. 6 to 11

ibid  
encls. 15  
and 19

ibid  
encl. 12

On 19 May 1936, Sir Thomas called on the two Departments to furnish him with their statements on the problem. These consisted of a series of five detailed papers (A to E) by the Admiralty setting forth their grievances and claims, a statement by the Air Ministry on the existing organisation of the Fleet Air Arm and their comments on the various Admiralty papers. From remarks in Admiralty Papers E and F it was apparent that they intended to once more press for the navalisation of the F.A.A. and to this was now to be added the complete control of the shorebased R.A.F. co-operation squadrons.

ibid  
encl. 16

Lord Swinton(2) had a private talk with Sir Thomas on the 8 June saying that he refused to discuss any Admiralty proposals as long as any of them involved a complete change of system, this being exactly the issue which the Prime Minister had directed he would not have reopened. On 12 June Sir Thomas wrote the First Lord(3) asking for the grievances of the Navy under the heading of manning and reserves only, and said it would be difficult to consider them if they were prefaced by categorical statements that only a complete change of system could remedy them.

A.H.B.  
ID/3/6

The First Lord replied on 18 June that the Naval Staff would delete any paragraphs that seemed to prejudice Sir Thomas Inskip's decision. This should not, however, imply that they had not strong and definite views upon the question of control but they were anxious for an impartial investigation of the naval grievances. He had told the Board that it was Sir Thomas's intention to carry out an enquiry into specific manning grievances and not to give any ultimate opinion on the wider issue until it was seen how far possible it was to remove the present cause of discontent.

ibid

This letter was sent for information to Lord Swinton and in the covering note Sir Thomas said that his Enquiry would be under the particular headings of:-

1. Provision of personnel
2. The period of service
3. The question of reserves

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- (1) The office of Minister for the Co-ordination of Defence was inaugurated in March 1936 and the first appointment was Sir Thomas Inskip.
  - (2) The Secretary of State for Air, Sir Philip Cunliffe-Lister, had just become Viscount Swinton.
  - (3) Sir Samuel Hoare had just replaced Sir Bolton Eyres-Monsell as First Lord of the Admiralty.

A.H.B.  
ID2/104(A)  
encl. 20

and he asked for a statement of the Air Ministry's views upon them. This was forthcoming on 9 July in a long memorandum which dealt very exhaustively with the subjects.

The Enquiry opened on 13 July 1936 with Sir Thomas Inskip in the Chair and at which were present the senior members of the Admiralty and Air Ministry.<sup>(1)</sup> The terms of reference were, as the Chairman announced, an Enquiry not into the whole question but limited to the provision of personnel, the period of service, and reserves of the Fleet Air Arm with a view to seeing how they could be made to work better than it was stated they worked at the present time.

ibid  
encls. 22  
and 23

At the first and second meetings the Admiralty representatives put their case which throughout complained that the dual system resulted in loss of efficiency mainly due to the fact that the Air Force quota were not 'sailors' and whose time of service with the F.A.A. was far too short and hinting that a separate service was the only solution. Lord Swinton opened the Air Ministry's reply by quoting from a 1935 report in which the C.-in-C. Atlantic Fleet had eulogised the work of the F.A.A. in a recent prolonged Fleet Exercise as showing marked efficiency and went on to quote from the First Sea Lord's own remarks in July 1934 before a Cabinet Sub-Committee that he deprecated any raising of the old controversy about a separate F.A.A. and that since the 1928 Salisbury Committee decision things had gone very smoothly and the F.A.A. system was working well. Having as he thought spiked the gun of separate service argument, Lord Swinton went on to outline the Air Ministry's proposals for achieving the 100 per cent reserve of pilots which the Admiralty considered a sufficient backing for the F.A.A.

A.H.B.  
ID2/102  
1st conclusions

The next two meetings were spent in detailed discussion as to how long it took to produce a reasonably efficient pilot for Fleet work which had a vital bearing on the total period of service in the F.A.A. by either naval or air force pilots with its consequent effect on the build-up of reserves. It was in these meetings that disagreement was most marked, particularly over the continual inference by the Admiralty representatives that the only solution was complete naval control of the manning and training system. The only point of contact was an offer by the Air Ministry to try as an experiment the entry of 12 naval ratings as pilots.

A.H.B.  
ID2/104(B)  
encl. 17

The final meetings failed completely to achieve agreement on the vexed question of reserves and after further exchange of opinions by correspondence Sir Thomas Inskip issued his Report on 3 November 1936. In it he gave his opinion that the minimum period of service in the F.A.A. by R.A.F. pilots should be four years, he accepted the Air Ministry's offer for a trial entry of 12 to 15 naval rating pilots but he gave no precise

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- (1) Those present were:-
- |  |                    |
|--|--------------------|
| Adml. of Fleet Sir Ernle Chatfield     | - 1st S.L.         |
| Adml. Sir Dunbar Nasmyth               | - 2nd S.L.         |
| Vice-Adml. Sir R. Henderson            | - 3rd S.L.         |
| Rear-Adml. Kennedy-Purvis              | - A.C.N.S.         |
| Viscount Swinton                       | - S. of S. for Air |
| Air Chief Marshal Sir Edward Ellington | - C.A.S.           |
| Air Marshal Sir F. Bowhill             | - A.M.P.           |

opinion or ruling on any method whereby a 100 per cent reserve could be built up. Moreover the increase of the R.A.F. period to four years from the existing two years made such a build-up impracticable. The concluding paragraph of the Report appeared to be out of accord with the avowed assurance that the existing Fleet Air Arm constitution was not to be questioned for it read:-

ibid  
para. 21

'No system could be satisfactory which subordinated the first-line efficiency of the Fleet Air Arm to the maintenance of the system, and I have no doubt that this will be recognised by those responsible for putting into force the above suggestions. It is no doubt true that a simple system would be easier to administer. The composite system not only sets a higher task in administrative method, but demands for its smooth working the closest contacts and collaboration. A constant endeavour is necessary to avoid over-elaboration tending to duplication of work. Clearly some difference of view may arise in the two Departments on a major question. In such a case the matter should be brought at once before Ministers for decision.'

ibid  
encls. 15  
and 18

As the C.A.S. remarked in his comments to Lord Swinton, the Report could not have been more unsatisfactory. 'Inskip had given an opinion on only one of the three subjects under investigation, thereby making the other two even more difficult and had shirked a decision on them'.

A.H.B.  
ID/3/6

ibid

Sir Thomas Inskip himself was in doubt as to whether his findings, limited in scope as they were by the ban on the separate service issue, were of much value. In a long letter to the Prime Minister, dated 5 November, he said as much and added that the probability of an alteration in the constitutional position of the Fleet Air Arm was being and had been continuously lobbied both inside and outside naval circles. He forecasted that some form of further enquiry would be required before this unhealthy atmosphere was dissipated. A copy of this letter was sent to Lord Swinton who showed it to Lord Weir, one of the pillars of the 1923 Balfour Committee. Lord Weir wrote a blunt letter to the Prime Minister to the effect that he himself was dead against any such enquiry, that the present situation had been catered for by his Committee, and the only answer short of disruption was that the two Services must learn to work together in the existing system.

A.H.B.  
ID2/104(B)  
encl.19

However, confirmation was given to the Admiralty by the Air Ministry, on 25 November, of their intention to do their best to ensure a four year tour for R.A.F. pilots in the F.A.A. and they would accept 12 to 15 naval rating pilots for flying training. They warned that the increase in length of tour would have an adverse effect upon the reserve of pilots available to the F.A.A.

Mention has been made in this section of the Admiralty's avowed intention to lay claim to the complete control of all the shorebased maritime aviation. The strength of this branch of the R.A.F. was growing and the next chapter gives the story from July 1934 to the end of 1937.

CHAPTER VIII

SHOREBASED MARITIME AIRCRAFT - JULY 1934 TO END OF 1937

(i) Comparison with the United States

The cumulative effect of the long period of restriction in the Defence Services was probably most felt by the Coastal Area of the R.A.F. whose resources in July 1934 were scanty and whose organisation itself was comparatively rudimentary. The shorebased operational units comprised only four squadrons of flying boats (total initial establishment eight Southamptons and eight Singapores) and one squadron of torpedo bombers (established at twelve Vildebeests). There were no landplane squadrons for reconnaissance, patrol or anti-submarine duties. It was still the theoretical plan to provide these in emergency together with bomber strikes from the Home Defence Force. Unfortunately for shorebased maritime aviation the newly arising German menace was considered as an air threat against the homeland only and in the following years of feverish rearmament little was spared for the equally important protection at sea of our commerce. It is true that in the Expansion Scheme A there was provision for four squadrons of General Purpose landplanes but the first of these did not appear until November 1935 and was then employed at the General Reconnaissance School at Manston. None became operational until the autumn of 1936. Until then the Home shorebased force remained at the diminutive figure of 28 aircraft. The bulk of Coastal Area's organisation was devoted to that portion of the Fleet Air Arm which was stationed in Home Waters which in July 1934 consisted of nine squadrons and three flights amounting in all to 120 aircraft.<sup>(1)</sup> This, as we have seen, was a difficult commitment owing to the incessant attempts by the Admiralty to obtain administrative as well as operational control.

Regarding the claim by the Admiralty to own the Coastal shorebased units as well as the Fleet Air Arm, it is of interest to note what was happening across the Atlantic in the case of the other great Naval Power - the United States of America. Under their National Defence Act of 1920 the scope and responsibilities of the U.S. Army and Navy Air Services had been very ambiguously worded. The Army Air Corps continued to claim the right and responsibilities of all aerial defence and offense from the coast against enemy surface and air craft including the safeguarding of coastwise merchant shipping, thus limiting the U.S. Navy Air Service ashore to flying training and experimental work. The Navy Air Service, on the other hand, demanded that all defensive or offensive operations of the Army Air Corps should cease at the tide line.

For years this difference raged, until in 1931 a general agreement rather favourable to the Army Air Corps was reached and made public by the respective Army and Navy Chiefs of Staff. In July 1932 the British Air Attaché was told by the U.S. Navy Chief Air Staff Officer that the Naval Air

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(1) In June 1933 all the Fleet Air Flights that were borne in Carriers had been reorganised into Squadrons. Aircraft borne in capital ships and cruisers remained as Flights.

A.H.B.  
IIA/1/47  
encl. 31

ibid

Service had no intention of abiding by the recent agreement by which coast defence duties had been allocated to the Army Air Corps. In 1933 the Army Air Corps was making attempts to obtain control over the U.S. Coast Guard Service, with its good communications and flying service, to assist them in a modernised scheme of coast defence. In this they were hotly opposed by the Navy Department who planned to amalgamate the Coast Guard with the Navy.

Early in 1934 the Naval authorities repudiated all previous agreements, the Army orders for amphibian aircraft suitable for coast defence were cancelled, and the quarrel raged more bitterly than ever before. In the event it continued to rage and never more bitterly than after the entry of America into the subsequent World War II.<sup>(1)</sup>

(ii) First signs of a policy for their use in Trade Defence

In the annual review of Imperial Defence Policy by the Chiefs of Staff Sub-Committee it was stated in April 1935 that in regard to air co-operation in Coast Defence at home there were four flying boat squadrons available to work with the naval forces. In addition, six out of the total of 75 land-plane squadrons which would eventually be available for Home Defence would be so trained and equipped<sup>(2)</sup> that they would be capable of employment either with the air counter-offensive or, if circumstances required, on attacks on enemy vessels approaching our shores. Providing the air situation elsewhere permitted, other squadrons of the Home Defence Force could be regarded as capable of assisting in the defence of our coasts in an emergency.

C.I.D.  
1181-B  
App. 2

The Naval Staff remained unconvinced and dissatisfied with what they called an 'ad hoc' policy for such a major commitment as air defence of trade in home waters. On 9 October 1935 the First Sea Lord raised a request in the Defence Requirements Committee for the formation of mobile air units based on depot ships in connection with the protection of trade routes and it was agreed that the whole subject of the co-operation of shore-based aircraft should be discussed between the Admiralty and the Air Ministry.

While an Admiralty memorandum on the subject was being prepared the Air Staff circulated a paper on 25 October epitomising the position of shorebased maritime aviation. In brief, it was stated that we should never have enough aircraft to be able to say of such and such a unit that its duties were solely naval co-operation or solely coast defence. In fact any unit such as an A.D.G.B. bomber squadron might in the last resort have to assist in repelling a bombardment by hostile warships. However, on the whole it was correct to say that there were certain units whose principal duties comprised reconnaissance and patrolling over the sea, usually in conjunction with naval forces, and there were other units

A.H.B.  
IIA/1/41  
encl. 35

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- (1) Reference "The R.A.F. in Maritime War" Volume III, Chap. III (iii) and Volume IV, Chap. I (v).
  - (2) This referred to the four Coastal General Purpose and two Coastal Torpedo Bomber squadrons to be provided by April 1939 in Air Expansion Scheme A.

of the torpedo bomber type charged with coast defence duties.<sup>(1)</sup>  
These units comprised the following types:-

Flying Boats - It was hoped to relieve flying boat units of much routine patrol duties by the introduction of the General Reconnaissance (G.R.) class of unit. This would enable flying boats to do the work for which they were particularly suited viz. long distance reconnaissance from temporary bases. For instance two F/B squadrons had been sent to Egypt in the present Abyssinian War emergency primarily for co-operation with the Mediterranean Fleet with S.S. Manela as a base vessel, the whole forming No. 4 (F/B) Wing. Similarly No. 210 Squadron had been sent to Gibraltar and No. 203 Squadron to Aden.

ibid

G.R. squadrons - It was hoped to produce a land type of aircraft costing much less than the flying boat and less vulnerable to hostile action. Working from a landing ground in the vicinity of its patrol area, far more patrolling could be done for a given outlay. Units of this nature would be situated in areas where enemy submarines were likely to be active.

Torpedo Bombers - For use in coast defence against approaching hostile warships. There were two squadrons at Singapore and one at home though this latter had been sent to Malta during the present emergency.

This relatively modest programme was swamped on 30 October when the Admiralty issued their memorandum on the requirements of aircraft for the protection of trade and for coastal operations. In this Paper the Naval Staff elaborated the idea of small carriers equipped with amphibian aircraft to carry out the major task of reconnaissance. They were, of course, to be naval manned and naval controlled. Shorebased aircraft were included and the Paper inferred that they also would be under naval control. In summary the requirements for war were:-

<u>Germany alone</u>	<u>Japan alone</u>	<u>Italy alone</u>
1 medium carrier (30 amphibians)	2 medium carriers (60 amphibians)	1 medium carrier (30 amphibians)
6 small carriers (90 amphibians)	7 small carriers (105 amphibians)	7 small carriers (105 amphibians)
162 Coastal aircraft	24 Coastal aircraft	8 Coastal aircraft

A.M.  
S.36710  
encl. 1B

The Naval Staff realised that, for financial reasons, all these forces could not be provided in peace time but it was considered that the following proportion was a reasonable requirement:-

- (1) By now these had been increased in Expansion Scheme C to seven General Purpose, two Torpedo Bomber and six Flying Boat squadrons aggregating 186 aircraft by April 1939.

1 medium carrier (30 amphibians)
4 small carriers (60 amphibians)
81 Coastal aircraft at home with 100 per cent reserve
36 Coastal aircraft at Singapore

ibid

Aerodromes and other facilities at various places around our coasts and in the Far East in Malaya were also listed. It was noted in the sections dealing with the duties of these aircraft that their primary purpose against raiders and submarines was only to report location and bring up patrolling cruisers or ASDIC fitted surface craft who would carry out the actual attack.

ibid  
encl. 2A

The Paper was cut to pieces in a ruthless criticism by the Air Ministry Plans Division<sup>(1)</sup> exposing the old naval demand for an expensive separate air service wasting the national resources and rigidly tied to purely defensive duties. It was particularly noted that in performing this ancillary task the aircraft were not to be regarded as the primary weapon. They were only to find the raider or submarine and, although capable of flying at 200 m.p.h. and of carrying bombs able to dispose of the enemy when found, yet the Admiralty plan envisaged these aircraft calling up surface craft, capable of only 30 knots or so, to the area indicated so as to act as the primary weapon in attack.

ibid  
encl. 9B

The answering Air Ministry memorandum was issued on 4 January 1936. In this it was stressed that there was a definite limit to the nation's first line strength imposed by the national resources in finance, material, personnel and industrial capacity. Within that limit must be compressed the requirements in aircraft for all military purposes. If large numbers of aircraft were specialised in ancillary roles the total air power of the nation was proportionately reduced. Some degree of specialisation was unavoidable, such as the Fleet Air Arm to the Fleet and the Army Co-operation squadrons to the Army but it was vital that the greatest possible proportion of our national air forces should be ubiquitous and capable of employment when and where necessary on whatever task was most pressing in any given circumstances.

ibid

In the more detailed sections on duties, it was stated that a better means of dealing with enemy submarines (which it was noted the Admiralty no longer regarded as a serious threat in view of modern A/S developments) lay in a long range bombing offensive against the enemy's main submarine bases and building yards. The Air Ministry did not regard the surface raider as such a menace as the Admiralty seemed to consider it (principally because in contrast to the last war, the modern merchant ships all carried wireless), but they did see Air Attack as a very serious threat both against shipping at sea and in terminal ports. In their opinion the most effective answer was a successful air counter-offensive against the sources of the enemy's air power, and the eventual attainment of air superiority.

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(1) The author was Group Captain A. T. Harris.

ibid

Finally, it was not proposed to put forward in this Paper details as to the number or precise location of squadrons required for Trade Defence as these would be discussed in the joint review which would have to be carried out by the Naval and Air Staffs. In broad outline, however, the basic principle was held to be versatility and mobility of Air Forces, and that the extra squadrons over and above the minimum necessary for local air defence should be equipped with modern high performance multi-engined shorebased aircraft with crews trained in reconnaissance, bombing and navigation duties. They would then be capable of employment with the main air offensive or the protection of shipping.

(iii) Admiralty claims to control maritime shorebased aircraft

A.H.B.  
IIA/1/61/9  
and  
IIA/1/41  
encl. 36

ibid

In February 1936 the Air Staff put on record their fears that the Admiralty were contemplating a renewed attempt to regain not only the Fleet Air Arm but all the shorebased maritime aircraft as well. They recalled that in their previous October appreciation they had pointed out the dangers of specialisation for tasks ancillary to the operations of the other two Services. The Admiralty's October memorandum had been the first official indication of a new demand for a separate reconnaissance force of small carriers with amphibian aircraft. Moreover this policy was not confined to shipborne aircraft and it was clear that it included entire responsibility for shorebased aircraft on coast defence, trade protection and naval co-operation in every form. Ample evidence had since been forthcoming through semi-official and unofficial channels including press propoganda that this was the Naval Staff's objective. The next step had been a claim early in 1936 in the Defence Requirements Committee for a Fleet Air Arm base ashore at an estimated cost of £5 million. This was the entering of a wedge to secure a completely separate naval shorebased air force with all the intolerable duplication and waste which had resulted in the similar case during the 1914/17 War and which was a minor reason for the formation of the unified R.A.F. in 1918.<sup>(1)</sup> The only solution was to adhere strictly to the existing arrangement whereby the Admiralty controlled the air forces specifically provided for employment with the Fleet and all other air forces remained under Air Ministry control without prejudice to the possibility of a proportion being from time to time allotted to duties of co-operation with Naval forces.

In the following month the newly appointed Minister for the Co-ordination of Defence (Sir Thomas Inskip) requested the Chiefs of Staff Sub-Committee to investigate the problem of protecting our seaborne trade in time of war. They directed in May that the Admiralty and Air Ministry memoranda on the subject should be put before the Joint Planning Committee as a basis for a considered C.I.D. Paper with terms of reference:-

- (a) How far they regarded air attack as a menace to our supplies of food and raw materials in time of war

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(1) The major reason was, of course, to make possible the principle of strategic bombing put forward by General Smuts - See Chapter I(vi).

- (b) How such attack should be countered.
- (c) What part the R.A.F. should play in co-operation with both the other Services in the protection of trade.

To revert for a moment to specific reasons of complaint by the Admiralty against the existing constitution of shorebased maritime co-operation. It will be remembered from the previous Chapter's section (v) that certain Admiralty Papers were sent to Sir Thomas Inskip in the preliminary stage of his enquiry into the Fleet Air Arm manning and reserve question. Two of them put forward claims to control the shorebased squadrons and furnished specific evidence in support. In Admiralty Paper B it was stated that at present no machinery existed for satisfactorily co-ordinating the work of ships with shorebased aircraft. There was no common headquarters or staff organisation although there was a nominal channel between the naval C.s-in-C. and the A.O.C. on each station abroad and at home. (1) The aircraft which were provided for duties ancillary to operations by the sea-going navy were officered by R.A.F. personnel only. Their training and contact with the Navy was limited to occasional exercises in conjunction with them and there was no permanent organisation for regular contact and common duties between them or for their more systematic mutual training. Paper F went even further as it stated that the provision of shorebased aircraft was entirely inadequate and the training of such units did not conform with naval requirements nor was the Admiralty freely consulted in this matter. The grievances were summed up as follows:-

1. 'It is and has long been the considered opinion of the Board and C.s-in-C. that the Fleet Air Arm and other Naval Co-operation Units are not functioning satisfactorily.
2. Moreover the shorebased Naval Co-operation Units, which are an indispensable factor in any operation, are wholly outside the control of the Navy whether operationally or in respect of their strength or their training.
3. The aircraft required for naval work, whether shore-based or embarked, are now specialised by differences in construction and equipment, and are as unsuitable for land work as land aircraft are for naval service.
4. It is clearly the responsibility of the Air Ministry to provide for and undertake action by means of R.A.F. forces against enemy industrial centres, ports and air bases ..... but the defence of sea communications involving operations at sea against enemy forces whether surface ships, submarines or aircraft is clearly the responsibility of the Admiralty and it must remain undivided. The Admiralty ought not

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(1) There was much substance in this complaint although the Air Ministry maintained that the A.O.C. Coastal Area and his staff existed largely for this very purpose. The fact remained, however, that there was no common headquarters, no close liaison and no common doctrine.

A.H.B.  
ID2/104/(A)  
encl. 7  
page 8

ibid  
encl. 12  
page 6

ibid

to be asked to accept their responsibility without full and undivided powers in regard to the provision, manning, training and operation of all the forces which are normally required for its service.'

Although these remarks about shorebased aircraft were withdrawn as having no bearing on Sir Thomas Inskip's limited Enquiry they remained a statement of Admiralty convictions and as such were advanced on every occasion when any kind of naval air co-operation was under consideration.

(iv) The first positive requirement for naval co-operation

The Joint Planners issued their report on 2 July 1936 under C.O.S.488 (J.P.) which dealt with the question of Trade Defence and Food Supply in time of war. It is of interest that the paragraphs which considered attack by enemy submarines contained the following:-

C.O.S.488 (J.P.)

A.H.B.  
IB/6/14

'As compared with the situation in 1915 to 1917 the problem of dealing with the submarine was more simplified by the invention of the ASDIC. So important is this development that, when the present policy of fitting all small warships is completed as it will shortly, the submarine will never again be able to present us with the problem we were faced with in 1917 and in fact it is considered that war experience will show that with adequate defenses, the operation of submarines against merchant vessels in convoy can be made unprofitable and a nation which has started such a policy would, as a result of the heavy losses in submarines, be compelled before long to abandon it.'

This was followed by consideration of what part the Air would take. Here appeared the fundamental disagreement between the Air and Naval Staffs. The Air Staff maintained that the correct answer to all the forms that enemy air attack might take lay in the provision of fighters to defend bases and ports, and bombers for an immediate counter-offensive. If large numbers of aircraft were specialised and thus prevented from being used on purely air operations, the total air power of the nation was proportionately reduced, shorebased aircraft must under no circumstances be permanently subordinated to ancillary duties however much they might appear to be suitable for co-operation in local surface operations over the sea. As regards training and navigation standards for long ranges over the sea, such standards were equally provided for by that now given to long range bomber squadrons. The Naval Staff, on the other hand, considered that large numbers of shorebased aircraft would be required for naval co-operation in trade defence, both for reconnaissance and attack which essentially involved highly specialised training and the provision of such aircraft in peacetime. In their view, therefore, if a considerable number of shorebased aircraft was not specialised in a role ancillary to sea forces, the power of the Admiralty to protect seaborne trade would be seriously reduced.

ibid

Another disagreement was shown over the question of safeguarding shipping in the narrow waters. The Air Staff maintained that convoy, although the obvious answer to unrestricted submarine attack where the enemy's speed was slow, was not the answer to similar unrestricted attack by

enemy aircraft. They considered in this that the Admiralty overestimated the effect of A/A gunfire and underestimated the effect of bombing. Moreover the convoy system automatically saved enemy aircraft much waste of time and energy in search for individual ships by collecting all potential targets and proclaiming their identity beyond all doubt. Convoy against air threat might further endanger our supplies instead of protecting them. (1)

ibid

It was agreed, however, that the major part to be played by the R.A.F. would consist of a general air offensive to deal with the threat from enemy aircraft, surface raiders and submarines at its source. Direct co-operation with the Navy would take the form of reconnaissance by shorebased aircraft for enemy warships, raiders and submarines to facilitate the concentration of our surface forces against them and, in certain circumstances, to attack with the locating aircraft. In exceptional circumstances some particularly important convoy might require fighter defence.

It was felt in the Chiefs of Staff Sub-Committee that the disagreements must be solved before issue as a C.I.D. Paper and on 23 July the C.A.S. proposed to omit these paragraphs in favour of two short statements:-

1. The defence of trade was a joint responsibility of the three Services in co-operation.
2. The most effective antidote to Air attack would be a successful air counter-offensive against the sources of this menace and this was the responsibility of the Air Ministry.

C.O.S. 504

and to require the Joint Planners to prepare a detailed plan as regards the employment of air forces which should include:-

- (i) the additional air bases required
- (ii) The proportion of the Metropolitan air striking force which should specifically be trained for the attack of enemy naval forces if and when required.
- (iii) If it was considered unavoidable that aircraft must be specialised for a role ancillary to sea forces and if so how many should be specialised.
- (iv) The best disposition of G.R. squadrons at home to enable them to fulfil their alternative roles of trade defence, air reconnaissance or the general air offensive in a European War.

This did not satisfy the First Sea Lord and on 7 August he suggested that, as it was not essential to the Joint Planners that the Chiefs of Staff should resolve immediately the points of disagreement, they should leave questions of principle

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- (1) A point of interest - In an Air Staff memorandum dated ten years previously (12 Feb. 1926) it was stated that the antidote to enemy air attack on our seaborne commerce was to adopt convoy and carry a few fighter aircraft either on platforms on large merchant ships or in small aircraft carriers escorting the convoys. Reference: A.H.B./1/4 encl.13.

aside and concentrate on the technical side of the subject. Their terms of reference should therefore be:-

C.O.S.508

- (a) Prepare an estimate of the numbers and types of shorebased aircraft required to be specialised in a role ancillary to sea forces to assist in the protection of our trade when at sea.
- (b) To report on the aerodrome and base organisation required for these aircraft, both in permanent occupation and for reinforcing air units in an emergency.
- (c) The above investigations to cover War with Germany, War with Japan, and simultaneous Wars on the assumption that we would remain on the defensive in the Far East till the war against Germany was won.
- (d) Due regard should be paid to the use of the flying boats.

A.M.  
S.36710  
encl. 22A

The C.A.S. disagreed with the wording of this suggestion as he said it assumed before investigation that large numbers of aircraft would be specialised in a role ancillary to sea forces - a principle which the Air Staff could not accept. Accordingly he put forward still another form for the Terms of Reference which read:-

C.O.S.512  
29 Sept. 1936

- (a) To examine the 'worst case' which might arise:-
  - (i) In a war with Germany
  - (ii) In a war with Japan
  - (iii) In a war with both simultaneously on the assumption that we should remain on the defensive in the East until the war with Germany was won.
- (b) To estimate the probable type, sources and scales of attack which would be experienced on our trade routes in each of the above contingencies.
- (c) To estimate the size and type of the force required to meet such attacks.
- (d) To consider the most effective disposition of the forces required under (c) above in war, and to estimate what additional aerodromes and other facilities should be provided in peace for this purpose.

C.I.D.  
1278-B

C.I.D.  
1280-B

This new form was agreed to by the First Sea Lord on 14 October and the Terms of Reference were passed to the Joint Planners. With an unfortunate sense of timing the Admiralty almost simultaneously gave notice of a future requirement for 150 light reconnaissance aircraft for use in war in the 75 Armed Merchant Cruisers which they proposed to commission. The Air Ministry queried the propriety of putting such an additional strain on the aircraft industry when it was becoming more and more obvious that there was difficulty in providing even for the existing vital air expansion programme. The matter was referred to the Minister for Co-ordination and on 30 December 1936 he ruled that the Air Ministry should

C.I.D.  
1293-B

accept this requirement as an increase in the Fleet Air Arm for which provision should be made, but only to become effective on mobilisation, without prejudice however to any priority directed by the C.I.D. for other requirements by the Air Ministry. He further ruled that no decision as to the personnel required should be made at this stage but it should be considered as part of the whole question of personnel when the Air Ministry was in a position to completely review their requirements.

C.O.S.535 (J.P.)

The Joint Planners rendered the first part of their report on 15 December 1936. This dealt only with a war with Germany<sup>(1)</sup> assumed to occur in 1939. In summary of this long report, it was considered that the main defence against enemy air attack on our shipping either at sea or in port lay in a successful general air counter-offensive. Against enemy surface warship attack it was most important to obtain information of their movements in the North Sea and to co-operate in the Northern Blockade Patrol. In the case of restricted submarine attack, definite areas would be patrolled by anti-submarine vessels working where necessary in co-operation with aircraft. In unrestricted warfare, convoy would be adopted and aircraft would be required to co-operate with the surface craft escorts. The minimum numbers of shorebased aircraft required were estimated as under:-

ibid

1. For air reconnaissance in the North Sea (South of the line Firth of Forth to S.W. Norway) to be carried out twice daily - A total of 34 aircraft
2. For Air co-operation with the Northern Blockade Patrol - A total of 12 aircraft
3. In the 'worst case' of unrestricted submarine and air attack at sea the convoy system would be inaugurated. One aircraft to be maintained continuously in the air during daylight hours with each convoy where attack was likely - A total of 165 aircraft
4. For air reconnaissance from oversea Atlantic ports against any surface raiders which succeeded in getting out we should require 12 aircraft at each of the main ports of Halifax (N.S.), Kingston (Jamaica), Gibraltar and Sierra Leone - A total of 48 aircraft.

ibid

There was thus a minimum total of 261 shorebased aircraft required at home. The location of existing aerodromes was considered suitable for the North Sea reconnaissance air forces and the disposition for close co-operation with convoys was given as in footnote<sup>(2)</sup>.

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- (1) On 2 November, Sir Thomas Inskip had requested the investigation to be hastened and to this end only Part I dealing with a German War was submitted, leaving Parts II and III to follow.
  - (2) Thames to Portland - 18 aircraft; Portland to Western Approaches - 30; Western Approaches to Milford Haven - 16; Bristol to Milford Haven - 6; Milford Haven to Liverpool and Belfast - 18; Belfast to the Clyde and northabout to the Forth - 51; Scandinavian convoys - 8; Forth to Thames - 18. Total - 165.  
Prior to the adoption of convoy in any or all of these areas, the aircraft would provide co-operation with the Anti-Submarine surface patrol forces.

Although this Report was accepted by the Chiefs of Staff Sub-Committee as a numerical basis representing the requirements for air co-operation with the Navy,<sup>(1)</sup> it still left unresolved the question of how much or how little the new Coastal Command's shorebased aircraft were to be specialised on shipping protection duties. The issue was still whether these aircraft should be regarded as solely for naval co-operation or whether they should be free to participate, if the need arose, with Bomber Command in a general air counter-offensive. The Air Staff took the view that the primary function of Coastal Command in war could not be established beforehand since the particular strategic needs of future conflicts could not be predicted. The object of this contention was to keep open the possibility of employing the Coastal landplane units on the air offensive which, it was believed, would be our best means of countering the 'knock-out' blow from the air which was generally assumed to be the strategy underlying Germany's massive air rearmament. So long as the Joint Planners' investigations into the air requirements for the protection of trade had not been completed (they still had to report on the two other war cases) it was possible to maintain this attitude. Thus although there was no uncompromising opposition to the 'specialisation' in theory, for fear of precipitating an official Admiralty demand for control of all shorebased maritime aviation, there was constant delay in reaching any decision. This resulted in failure to determine at an early stage Coastal Command's operational role in war with consequent unfortunate repercussions on its training policy.

(v) Operational exercises and increase in strength - 1935 to 1937

Meanwhile the exercise programme had sunk to a low ebb during the years 1935 and 1936. Very few exercises took place in home waters. From January to June 1935, No. 210 Squadron was engaged in flying new Singapore flying boats out to re-equip No. 205 Squadron at Singapore. No. 209 continued to have aircraft troubles for the whole year in spite of re-equipping with the Perth flying boat in place of the Iris V, and the newly formed No. 230 Squadron were not operational on their Singapores until mid-Summer. Only Nos. 201 and 204 flying boat and No. 22 torpedo-bomber squadrons were available during the first half of the year. They took part in two Fleet exercises, a small Coast Defence exercise and two exercises with the 5th S/M Flotilla and the A/S School while No. 22 Squadron carried out some torpedo attacks on a target cruiser.

See Appendix XI

All exercises ceased from mid-Summer onwards because of the rising tension occasioned by the Italo/Abyssinian War. Nos. 204 and 210 Squadrons re-armed respectively with Scapa and Rangoon flying boats and in September were despatched abroad, No. 210 to Gibraltar and No. 204 together with No. 230 Squadron to Alexandria. No. 22 Squadron followed in October and was stationed at Malta. All these squadrons, including the permanent No. 202 (now on Scapa flying boats), carried out special patrols designed to meet the strained relationship with Italy and also co-operated in exercises with the Mediterranean Fleet.

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(1) At this stage (December 1936) there were only 90 shore-based aircraft in Coastal Command.

ibid

This major detachment continued in Mediterranean waters into 1936 and up to the end of August. At home there were only Nos. 201 and 209 Squadrons, the latter being now partially operational on a mixture of Singapore and Southamptons. Between them they carried out four shadowing exercises with the 1st Battle Squadron and two exercises with the 3rd S/M Flotilla and the Portland A/S School. September 1936 saw the return home from the Mediterranean of the three flying boat squadrons but No. 230 was immediately despatched to the Far East and No. 210 came out of the line to re-equip with Singapore boats. The torpedo-bomber squadron returned later in the year. Thus only Nos. 201, 204 and 209 Squadrons were available for exercises during the last quarter of 1936. In October an extensive Fleet reconnaissance and night shadowing exercise was carried out by them in the North Sea and in this they were joined on the last day of operations by the first of the G.R. landplane squadrons - No. 48 equipped with Anson aircraft.<sup>(1)</sup> During the remaining two months, the three flying boat squadrons only took part in shadowing exercises with single units of the 1st Battle Squadron and one A/S Patrol exercise with submarines.

Between the last months of 1936 and mid-1937 the newly established Coastal Command received some welcome increases. An additional torpedo-bomber squadron (No. 42) was formed on the nucleus of a flight from No. 22 Squadron, a new flying boat squadron (No. 228) became operational on a mixed equipment of one London, one Scapa and three Singapores, and the land based G.R. Anson squadrons were forming in rapid succession. Of these, No. 206 appeared in the autumn of 1936, followed by Nos. 220 and 269 at the end of the year and Nos. 224, 217 and 233 Squadrons during the first half of 1937. Re-equipment to the latest types of flying boat was proceeding and by March 1937 both Nos. 201 and 204 Squadrons had Londons and the first Stranraer had gone to No. 228 Squadron.

ibid

With this growing force becoming fully operational, the exercises during 1937 were far more numerous and diverse in character. There were two full scale combined exercises, one being Trade Protection and the other Coast Defence (exercise CDX). Fleet exercises numbered seven, three exercises in night operations took place and there were six torpedo and bombing attack exercises besides the normal routine practice with these weapons. Four exercises were done with the submarine flotillas and two with the Portland A/S School with additional ship and submarine recognition exercises. Between August and December, three of the flying boat squadrons (Nos. 204, 209 and 210) were detached to the Western Mediterranean where they were employed on 'anti-piracy' patrols under the Nyon Agreement during the Spanish Civil War. Several A/S exercises were also carried out with destroyers and submarines from Gibraltar.

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(1) No. 48 Squadron was actually formed at the end of 1935. From January 1936 the squadron was equipped with Cloud aircraft until re-arming with Ansons in the summer. The squadron was attached to No. 23 Group, Training Command and stationed at Manston, Kent. They were employed in giving operational experience to the G.R. Training School courses. Until September 1938, when they were incorporated in Coastal Command, the squadron participated in several Fleet Exercises when these took place within range of Manston.

In addition during 1937 there were several independent cruises by squadrons. No. 201 went to Malta for 14 days in January, No. 210 spent all April cruising in the Mediterranean, No. 209 went to Malta for 16 days in May/June and, after the termination in December of the Nyon Agreement patrols, No. 204 Squadron left on an extended cruise to Australia.

(vi) Vacillation in deciding Coastal Command's Role in war

As seen from Chapter VII (iii), Coastal 'Area' was upgraded to Coastal 'Command' in January 1936 but the change over to a new scheme of internal organisation was not complete until the end of that year. By then the A.O.C.-in-C. was Air Marshal P. B. Joubert de la Ferte, C.B., C.M.G., D.S.O., and his new staff organisation came officially into being on 1 January 1937. The Chiefs of Staff Sub-Committee had just accepted the first part of the Joint Planners' Report giving the numerical requirements for the future maritime shorebased air co-operation with the Navy. In Home Waters these amounted to a minimum total of 261 aircraft but at this date the strength of Coastal Command's shorebased aircraft was only 90 first line aircraft made up of five flying boat squadrons (one just formed), three G.R. Anson squadrons (one just formed) and two Vildebeest torpedo-bomber squadrons (one just formed). The various stations were all under No. 16 (Reconnaissance) Group whose headquarters were at Lee-on-Solent.

See  
Appendix V  
appropriate  
date

Up to the end of 1936 the naval co-operation exercises which were carried out had been disjointed and characterised by a general lack of realism. There was still no definite role in war apportioned to the Coastal units. The nearest approach had been put forward at the end of 1935 in an Air Staff paper in which it was stated that the primary role of the shorebased units was Coast Defence involving reconnaissance for the Fleet, patrols off shore, the attack of enemy ships and general co-operation with naval forces but it went on to say that if the air threat to this country exceeded the seaborne threat, the G.R. and Torpedo-Bomber squadrons were to assist the counter air offensive against targets in enemy territory. In the event of an extra-European war it was probable that a large proportion, if not all, of the Coastal units might be required immediately for employment overseas. This latter provision actually took place when three out of the four flying boat squadrons and the only torpedo-bomber squadron were sent to the Mediterranean during the Italian crisis between September 1935 and August 1936.

A.M.  
S. 32145  
encl. 9A

After these squadrons had returned later in 1936, the first two G.R. Anson squadrons were formed and on 23 November the Air Staff defined the emergency employment of Coastal units if hostilities broke out during the next six months. Assuming that Germany would be the enemy, the role of the Flying Boat and G.R. squadrons would be to locate and report enemy surface craft and submarines; to shadow enemy naval forces by day and night; and to be prepared to attack such forces. They would also be required to report any movement of enemy aircraft (N.B. As yet there was no R.D.F.) while the flying boats might, in addition, be required to keep watch over certain enemy ports and naval bases. The Torpedo-Bomber squadron would either be required to reinforce Bomber Command or act as a striking force against enemy surface ships.

ibid  
encl. 23A

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Slightly in advance of the Joint Planners' first report on trade defence, the Air Staff on 7 December 1936 put on record their view of the North Sea Reconnaissance requirement. This was considered as covering the following purposes:-

- (a) The protection of trade, in particular against air, surface and submarine raiders operating against our shipping.
- (b) In aid of Fleet operations, in particular the observation of activity in enemy bases and during the approach period prior to contact between the opposing fleet units.
- (c) To provide warning of the approach of enemy aircraft, whether with shore bombing objectives or to attack our shipping.

In the Air Staff view it was patently wasteful if this general reconnaissance was to be met by planning for each individual requirement as opposed to being regarded and planned as a combined requirement. While the stated requirement of two daily sweeps of the North Sea southward of the line Firth of Forth to South Norway fulfilled the requirement of trade defence, it also covered to a certain extent each of the other purposes. Furthermore much of the reconnaissance in the southern part of the North Sea might be done by the regular bomber traffic on the way to and from their objectives in Germany. If enemy air opposition appeared, it might require formations of bomber aircraft who, however, must in addition to their reconnaissance function be employed on attacking either the naval bases themselves or other objectives on or near the reconnaissance routes.

While the Air Staff did not dispute that a certain minimum of aircraft would be required to fulfil the trade defence reconnaissance, they did in fact strongly dispute that this number must be definitely tied down to that requirement alone. They held the view that a great deal of experiment and practice would be required before the reconnaissance problem of the North Sea or any other area could be economically and satisfactorily solved as a whole and the detailed requirements in each case would only emerge as a result of experience during the development of any individual campaign. There would be periods when full reconnaissance for all purposes would not be essential and other periods when a very considerable addition might be temporarily required. The G.R. aircraft were to all intents, a light bomber type and while it would be inconceivable that we should have standing idle a number of aircraft well suited for use in the main bomber offensive, it would be still more unwise to be unable, through insufficient training, to transfer a number of the metropolitan force to the defence of trade or reconnaissance or other operation over the sea should this become the vital necessity of the moment. This principle of preserving flexibility within our total air resources was the prime essential if we were to meet the many and varied menaces in the widely differing areas in which they developed.

On 22 December 1936 Air Marshal Joubert gave his views on what were Coastal Command's responsibilities. He concluded that as it was likely that the most immediate threat would be from the German Air Force it was probable that his Command

A.M.  
S.36710  
encl. 34A

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A.M.  
S.36876  
encl. 9A

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would be mainly concerned in supporting Bomber and Fighter Commands. However, until the threat from the German Navy had been met, some Coastal units would be needed to assist in the task of protecting sea communications in narrow waters. In a war against an enemy beyond effective air range from Great Britain, he asserted that the main responsibility of Coastal Command would be to act as a source of reinforcements to units already based abroad.

A.M.  
S.40559  
encl. 9A

None of these views were agreed in by the Air Ministry Branch most concerned. In an able minute dated 1 March 1937 the Department for Naval Co-operation (D.O.N.C.) pointed out that neither participation in a general air offensive nor the provision of overseas reinforcements were duties which should be undertaken before our sea communications had been assured and the threat of seaborne attack removed. The assumption that the German fleet would wait passively in harbour was unjustifiable and even if the German pocket battleships did not put to sea, the submarine and surface raider menace would probably be sufficiently serious as to make any diversion Coastal units to other tasks unwarrantable. The minute suggested, therefore, that the primary role of Coastal Command should be 'maritime co-operation'. Unless this was adopted there would be a definite reaction from the Admiralty in favour of transferring control of these units to the Navy. It seemed to follow from the specialised training required for Coastal Command's units that their role in war should also be specialised. Units which operated over the sea undoubtedly had a harder task and required more training than those working over land. It would be quite impossible to include courses in ship recognition, coast defence, anti-submarine patrols, naval co-operation, protection of trade, sea reconnaissance etc., in the training of Bomber and Fighter pilots without detracting from the efficiency of their basic R.A.F. functions. To give such specialist training to Coastal units and then to employ them to strengthen the counter air offensive would not only be illogical but grossly uneconomic.

ibid

ibid  
encl. 18A  
and  
A.M.  
S.32145  
encl. 28A

Unfortunately this clear-sighted appreciation of the problem did not make the impression it should have and the Air Staff adopted a compromise solution. This was contained in the Air Ministry instructions given to Coastal Command on 25 March 1937 which were to remain valid until further notice and superseded all earlier instructions. After preliminary general remarks the document ran as follows:-

'Broadly speaking there are two main roles on which the units of Coastal Command may be employed in war:-

1. Co-operation with the Bomber Command in the main strategical air offensive.
2. Co-operation with naval forces and such army forces as are allotted for coast defence in countering enemy attacks on our coast and sea communications.

The relative importance of these two roles will vary in different campaigns ..... and it is impossible to state definitely whether one or the other is the primary role,

as a combination of both may well be necessary. The units of the Coastal Command must therefore be trained to carry out both roles.'

This impracticable dual role continued in force while the fate of Coastal Command hung in the balance during the early summer, and even after the Admiralty claim to the shorebased units were rejected<sup>(1)</sup> it remained in force until the final report on Trade Defence Requirements was approved by the Committee of Imperial Defence in December 1937 when at last a definite War Role was adopted.<sup>(2)</sup>

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(1) See Chapter X (v).  
(2) See Chapter XI (i).

CHAPTER IX

BOMB VERSUS BATTLESHIP

1921 TO 1939

(i) Introduction

By the final stage of the First World War it was plain that aircraft would soon be capable of dropping relatively heavy bombs on warships. It was natural that, after the war, the possibilities of the new weapon of the air should be investigated against the capital ship which represented the accepted basic unit and backbone of naval power.

The course of these investigations and trials cannot conveniently be fitted into the chronologically arranged chapters of this volume as they had little to do with high level policy on the Unified Air Force or with the Fleet Air Arm controversy. It is considered, therefore, that the subject is better treated as an independent self-contained chapter.

The very nature of the subject automatically raised inter-service contention and gave rise to sweeping claims by either side which were incapable of positive proof in the necessarily unreal conditions of peacetime trials. Small wonder was it that the controversy dragged on year after year but the real disservice was that in focussing attention on the capital ship, it helped to perpetuate the theory that our next naval war would continue to be a matter of main fleet action with bombing aircraft acting as an ancillary weapon.

The net result as far as the Air Force was concerned was an unending series of academic fine weather bomb-dropping exercises at a slow moving target in a known position, and a complete absence of any training in primarily searching for and hitting a highly mobile detachment of warships in the open sea far from our own sea forces - the only form of target offered by the German Navy in the Second World War. The "Bomb versus Battleship" controversy has much to answer for in the unreadiness of the Air for maritime war in 1939.

(ii) Early bombing trials

Except for attacks on U-boats, there had been virtually no experience during the 1914/18 War of bombing attacks on ships at sea.(1) During the postwar reorganisation of the Air Force no thought could be given to such possibilities until the tentative evidence given by the Air Staff before the Bonar Law Committee early in 1921. This brought rejoinders from naval opinion that air attack was limited by so many factors that it could be discounted for many years ahead.(2)

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- (1) The only instance at sea occurred in April 1917 when Handley Page bombers attacked five German destroyers off Ostend - see Chapter II (xvi). Later, in 1918 the German battlecruiser Goeben was attacked by R.N.A.S. aircraft after she had run aground in the Dardanelles. Three days continuous attack secured very few hits and no more than superficial damage was inflicted.
- (2) See Chapter IV (i).

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However, attention was focussed on the still nebulous possibilities of air attack by a series of trials conducted in American waters during July 1921. These were held on the suggestion of General W. Mitchell (then the Assistant Chief of the U.S. Army Air Service) but were actually conducted by the U.S. Navy Department and were watched by the British Naval Attaché. General Mitchell's concern was to disprove the current naval opinion that battleships could not be sunk by air attack but the U.S. Naval Staff were mainly interested to discover how much capital ships could be damaged by direct hits with bombs of various calibre. It was, therefore, their concern to limit strictly the number of hits so that they could from time to time examine the effects.

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The testing ground lay in deep water some 75 miles off the Virginia Capes where certain ex-German warships were moored. The bombing was carried out from a relatively low altitude by U.S. Naval Air seaplanes and some twin engined Martin bombers of the U.S. Army Air Service. The first trial was on the light cruiser Frankfurt which was hit by twelve medium 250 lb. and 350 lb. bombs out of some 60 released. Much damage was done to the upper deck and superstructure but the ship was in no danger of sinking. Half an hour later, six Martin bombers dropped twelve 600 lb. bombs in ten minutes and the last bomb was a very near miss which exploded almost under the ship abreast the forecastle. The effect was immediate in that the Frankfurt sank bows first a few minutes later.

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After this rather unexpectedly rapid disposal, the Naval authorities took every precaution against a repetition in the case of the major trial which was on the battleship Ostfriesland. On 20 July she was attacked with 52 bombs of various sizes up to 600 lbs. Four direct hits and four near misses were scored but only resulted in damage to the upper works. On the following morning Martin bombers dropped five 1,000 lb. bombs and scored three direct hits, after which the attack was stopped. Two of these hits penetrated the upper deck causing considerable wreckage below but the umpires decided that under war conditions she could have made port. A further attack was then allowed with Martin bombers carrying 2,000 lb. bombs. Six were released, one hit the forecastle and three others were near misses bursting very close off the starboard bow and port side of the ship which then settled by the stern and ten minutes later capsized to port.

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The report on these two episodes was rendered by the Joint U.S. Army and Navy Board under the presidency of General Pershing and on which there was no representative of the Air Services. The British Naval Attaché noted that throughout the Report the predominating influence of the Navy members was very evident in playing down any conclusion favourable to air attack. In his own observations he stressed the effect of near miss bursts under water which "were so immediate and overwhelming as to render it immaterial whether these two vessels were possessed of watertight integrity or not". The official account, he said, "failed to convey a correct impression of the disastrous effects of these particular bombs".

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Although these results came as a shock to American naval opinion they rightly pointed out that the experiments were carried out under the most favourable conditions for aircraft, against moored targets with no A/A opposition, and without crews for taking damage control measures. To this the

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air authorities replied that there was no ammunition in the magazines or turret handing rooms to explode, and no steam pressure in the boilers. Far from settling any question the results opened the long "Bomb versus Battleship" argument in both American and British service circles.

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Other trials took place concurrently on destroyers and submarines but their significance was lost in the greater interest attached to the capital ship results. For instance, the ex-German destroyer S.132 took two hours to be sunk by 5 inch gunfire from a cruiser but the G.102 was sent to the bottom in 20 minutes by one air attack in which the aircraft released 300 lb. bombs. Still more significantly the ex-German submarine U.117 was sunk in five minutes by aircraft using 300 lb. bombs but U.48 took 29 minutes and U.140 one hour and a half to sink under gunfire from destroyers.

That capital ships could be sunk by heavy bombs was further demonstrated in September 1921 when the old U.S. battleship Alabama was sent to the bottom by 2,000 lb. bombs and in September 1923 when the target ship New Jersey of 15,000 tons sank in five minutes after receiving direct hits. In the same month her sister ship the Virginia was attacked with 14 - 1,000 lb. bombs from 10,000 feet. A direct hit just abaft the main mast reduced the funnels, superstructure and upper deck to a tangled mass and 20 minutes later the ship foundered.

However, the other side of the picture was demonstrated in a later trial on the uncompleted battleship Washington. After three 2,000 lb. bombs and two 400 lb. torpedo warheads had been exploded successively in contact with or close to the ship's bottom, the ship remained afloat for four days and rode out a gale at her moorings. This test was specially to the fore in a report of a Naval Board set up by President Coolidge early in 1925. In the Board's findings it was concluded that:-

"..... the battleship of today, whilst not invulnerable to airplane attack, still possesses very efficient structural protection as shown by the experiments on the Washington. The battleship of the future can be so designed as to the distribution of her armour on deck and sides and as to interior sub-division that she will not be subject to fatal damage from the air. The effect of plunging long range gun hits on a ship's deck has now become closely analagous to the effect of hits by heavy aerial bombs. By armouring the decks with six to seven inches of armour we at once and at the same time effectively meet any practicable attack from the air and also the attack by gun projectiles fired at the greatest probable battle ranges. The interior subdivision will resist any mining effect from aerial bombs. It cannot be said, therefore, that air attack has rendered the battleship obsolete."

The 1921 experimental bombing of the Ostfriesland naturally stimulated British interest but the trials over here were not on the ambitious scale which was undertaken in American waters. Moreover the tests were not conducted with a view to destroying the target but rather to increase the accuracy of bombing and improve the methods and tactics of

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air attack. Such trials commenced later in 1921 against the old battleship Agamemnon which had been fitted out as a mobile target ship and were carried out by Handley Page bombers in individual attacks from 4,000 to 8,000 feet with the ship steering a steady course. Sixty-one bombs were dropped resulting in 16% hits. Similar trials were continued in August 1922 by D.H.9A, Vickers Vimy and Handley Page aircraft from 2,000 to 8,000 feet but the poor visibility conditions reduced the hitting percentage to only 8. Further trials were conducted in 1923 when formation salvo bombing was introduced and the height raised to 8,000 to 14,000 feet. The individual attack hits fell again to 2 $\frac{1}{2}$ % but the formation bombing secured 10%. No sea trials were done in 1924. In addition to these "under way" trials against the Agamemnon there were experiments against the old battleships Monarch and Marlborough with statically exploded bombs to determine the extent to which a ship's fighting efficiency could be impaired by hits which would not actually sink her. More ambitious trials against the Agamemnon were carried out during 1925 and bombs were released up to 14,000 feet with the target ship steaming faster and steering varying courses but not taking avoiding action. The results were very disappointing in that formation salvo bombing hits fell to 2 $\frac{1}{2}$ % and no hits at all were recorded for the individual attacks. Lack of adequate training and the faulty use of equipment was the direct cause of this failure but the bombsight itself was plainly a reason for the progressively worsening results in spite of the favourable though artificial tactical conditions.

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In a November 1926 summary of results of trials held during the years 1921 to 1925 it was estimated that the average percentage of direct hits was 5.5 with a further 5.5 per cent near misses.(1) The report went on to say that the trials were carried out under purely experimental conditions and constituted only the initial stages of development of the bombing of ships at sea by aircraft. New designs of bomb sights and other instrumental aids were on the way which together with more intensive training would increase the accuracy. Although no "under way" trials were held for the next three years it was possible to make a fairly systematic evaluation of the chances of air attack against ships. As yet it was only the attack on capital ships that argument raged around and even this was narrowed to capital ships in a Fleet. The Fleet, either cruising alone or in action with the enemy fleet, was the ultimate objective of all consideration.

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The Air Staff put on record a recapitulation of the various forms of attack on a capital ship in a paper dated 2 May 1928. In summary this considered that there were two methods of sinking a ship:-

- (A) By so damaging the ship internally that she blows up or floods. This could only be achieved by direct hits with armour piercing bombs.
- (B) By flooding the ship through under water attack. This could be achieved by:-

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(1) A bomb falling within 10 feet of the ship's side was reckoned as a near miss.

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- (i) A near miss with high explosive bombs.
- (ii) A direct hit by a torpedo.
- (iii) A direct hit on the bottom by the buoyant bomb (see next section).

(A) was by far the most difficult, lengthy and costly method. In order to inflict the requisite damage bombs must be dropped from a considerable height so as to penetrate the vitals of the ship and in large numbers because of the low percentage of explosive in armour piercing bombs. The target was small and moving and required the aircraft to make a steady approach for some time thereby presenting good opportunities to A/A fire and losing any element of surprise. Cloud at lower than 10,000 feet would force the aircraft to such low altitudes that the necessary velocity of the bombs for penetration could not be attained.

As regards (B) (i), recent trials indicated that the near miss with existing bombs could be disregarded as an effective method of sinking a ship. Against a battleship's side armour and the prospective blister protection the small ratio of explosive in the standard bombs gave little or no result.

On the other hand, in the case of (B) (ii) aircraft possessed powers out of all proportion greater than those possessed by destroyers or submarines by reason of its range, its speed and mobility, the third dimension of its action and great element of surprise, and the small fleeting target it presented to the guns of the ships. Moreover, torpedo aircraft were at a greater tactical advantage than aircraft bombing from high altitudes. They could operate on days of low visibility, make use of cloud to cover their approach and retreat, and unlike the bomb which misses its target, their torpedoes might find another target in the ships of the squadron or fleet adjacent to the actual ship fired at. However, they suffered the same disadvantage as other craft using the torpedo in that they were compelled to strike a part of the ship which was now protected against this form of attack.

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There remained the buoyant or B-bomb. Here the attack was made on the most vulnerable part of the ship and which so far was entirely unprotected. The bomb itself, carried a high percentage of explosive and the aircraft delivering the attack were in an even better tactical position than the torpedo plane in that they had a free choice of altitude, no sighting was required, and the bomb could be dropped during a dive necessitating neither the steady approach of the bomber nor the level wave-top flight of the torpedo plane.

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At this date, therefore, neither the A.P. nor the S.A.P. bomb, which were the only types which could hurt a capital ship, were considered of much value and in any case compared unfavourably with the gun; the airborne torpedo was regarded as the weapon most likely to obtain hits but the Buoyant Bomb, if current development could surmount initial teething troubles, seemed to present the best chance of successful attack.

(iii) Types of Bombs, Bomb Sights and Distributors

(a) Conventional types of bombs

After the 1914/1918 War the R.A.F. was left with large stocks of bombs which were a mixed collection of all shapes and sizes. Owing to the preoccupation with the rebuilding of the R.A.F. it was 1923 before consideration was complete as to the form and design of the future standard bombs. In this year the Air Staff stated the requirement as four sizes, all of the General Purpose (G.P.) category.(1) These were of 50 lbs., 120 lbs., 250 lbs. and 500 lbs. weight. The 50 lb. bomb was found to require such constant re-design that in July 1925, after extended trials, only the three larger sizes were put into production. In July 1927 designs were approved for a 1,000 and a 2,000 lb. G.P. bomb. Development of these continued until July 1932 when the Air Staff decided that in view of the limited carrying capacity of near future aircraft design, the weight of any type of bomb must be limited to 500 lbs. and thereafter until 1938 only the three lighter sizes would continue. In June 1938 the re-introduction of bombs of 1,000 lbs. and over was recommended as not only could the modern bombers carry them but a much heavier bomb than the 500 pounder was required to attack such targets as dams, aqueducts and canals. The previous development was resumed but neither of the heavy bombs came into Service until 1940.

Although an Armour Piercing Bomb (A.P.) had been proposed as early as 1921, it was not till the end of 1925 that the design for the Mk.I 450 lb. A.P. bomb was approved and not till 1928 was it manufactured. Subsequent modifications to overcome constructional weakness resulted in a Mark II design which was not fully approved until March 1932. By now, however, much heavier deck armour was being fitted in capital ships and the bomb was plainly unequal to its task of penetration. In July 1932 the Air Staff agreed that the requirement had lapsed and the whole 450 lb. A.P. series was abandoned. The need for a much heavier A.P. bomb had been foreseen and as early as 1924 some models of a 1,500 lb. A.P. bomb were constructed. Trials in 1927 were unsatisfactory and early in 1928 it was decided to redesign the bomb to weigh 2,000 lbs. but to continue with the 1,500 pounder for trials data. The next three years were taken up with experiments and trials, and by November 1931 the empty Mark I 1,500 lb. A.P. bomb was approved. It still remained to finalise the type and method of filling. Similar trials were conducted concurrently with the 2,000 lb. A.P. bomb and in May 1932 the empty form of this bomb was approved. Then in July 1932 came the Air Staff decision to limit the weight of all individual bombs to 500 lbs. and development of both these bombs was abandoned. Although the 2,000 lb. size was revived at the end of May 1936 in view of the adequate carrying capacity of the new types of aircraft envisaged, the trials and development were not completed until just after the outbreak of war in 1939.

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(1) The G.P. bomb had an explosive/weight ratio of between 25 and 30 per cent, the S.A.P. bomb was about 18 per cent, and the A.P. bomb only 13 per cent.

The Semi-Armour Piercing Bombs (S.A.P.) of 250 and 500 lb. weight did not make their appearance under service conditions until March 1931 and were first dropped from aircraft in trials against the target ship Marlborough in February 1932. Thereafter they were in regular service.

Light case Anti-Submarine Bombs did not become a requirement until July 1924 and were to be of 250 and 500 lbs. weight. A year later the Admiralty asked for an additional size of 100 lbs. and designs for all three sizes went forward with a priority on the production of the 100 lb. size. Very great trouble was experienced with the fuzing and construction of these bombs necessitating constant re-design. Up to June 1938, four distinct Marks had been reproduced in varying small quantities but none proved at all satisfactory.

A more detailed account of all the above types of bombs is given at Appendix VIII and it is true to say that in September 1939 the R.A.F. had no bombs larger than the 500 lbs. size and that these were essentially little different from those used in 1918. This position was not so much a reflection on those responsible for armament design as the unavoidable result of the policy dictated by economy and the considered remoteness of actual warfare.

(b) The Buoyant B-Bomb

Up to date the main air menace to the battleship was held to be the torpedo plane and the bomber. Early in 1928 there came a third weapon from which decisive results were hoped. This was the Buoyant Bomb which, it was intended, would be released in numbers from the air ahead of the enemy fleet. After entering the water the bomb was designed to rise slowly to the surface and detonate on the bottoms of the advancing ships. No convincing results had yet been obtained in trials but in view of the armouring of ships' decks against bombs and the fitment of blisters along the waterline against torpedoes and near miss bombs, this weapon which aimed at the unprotected bottom of a ship was hailed as the triumphal answer to all the belittling of other air attack methods.

The B-bomb had been resurrected in 1923 from a previously abandoned project. Trial experimental bombs were completed in 1925 but considerable teething troubles were encountered which necessitated several fresh designs. Trials continued during the next two years and in 1928 these gave promise of a worthwhile weapon. However, further delays occurred over the production of a reliable fuze and it was not till early 1931 that the bomb was ready for sea trials against a ship. These were sufficiently promising for its future to be considered at an Admiralty Conference in February 1932 when definite proof was required as to whether the bomb would invariably detonate if it came up underneath a ship, to what degree would this detonation affect the ship, and how close ahead must it be dropped to frustrate avoiding action by the ship. Before these questions could be answered, further full scale trials were required but those carried out in 1933 and 1934 were unconvincing and the last two questions were never answered. In the interim, however, the bomb was practically rebuilt to new designs but a reliable fuze was not fitted until 1939 when at last the B-bomb was accepted as a standard weapon.

On the outbreak of war, the B-bomb was issued in quantity to Coastal Command but was only used on very infrequent occasions and with no result whatever so that it soon lapsed as a weapon. Although technically sound as a missile, it was operationally inappropriate. A fuller account of this bomb is given at Appendix VIII.

(c) Bomb Sights

The first really efficient device was the Course-Setting Bombsight (C.S.B.S.). This was designed during the First World War by Mr. H. E. Wimperis, then head of the Air Ministry Laboratories, for attack on submarines. By the end of 1917 this sight had superseded all others and for the next 22 years was the standard bombsight of the R.A.F. though with considerable structural and material modifications. Briefly, it was a mechanical vector triangle whose three elements, air speed, wind speed and direction, and resulting ground speed, could be measured. The first two were calculated and set on the bombsight by the bomb aimer, and the third was the resultant of their combination. The height bar, carrying a movable open back sight was calibrated in aircraft height and was angularly tilted to allow for bomb ballistics. Indication of the calculated point of bomb impact on the ground was continuously given by sighting through a back sight attached to the "height bar" and a fore sight attached to the junction of wind speed and ground speed bars.

Unfortunately two major difficulties were inherent in the design:-

- (a) The sight had to be level during the run-up and release.
- (b) Corrections in course given by the bomb aimer to the pilot in order to track the aircraft directly over the target involved an adjustment of all three sides of the vector triangle which, although semi-automatic through a system of gears, did involve continual re-orientation of the sight with the magnetic compass.

The original Mark I C.S.B.S. allowed for bombing between 200 and 2,500 feet, at air speeds from 55 to 100 knots, and in winds of 0 to 50 knots. It was followed in 1919 by a Mark II version adapted for high altitude bombing. This remained, with various modifications to keep pace with increasing aircraft performance and improved bomb ballistics, standard until 1929.(1) In this year the Mark II was replaced by the Mark VII equipped with a fourth vector mechanism designed for use against ships. On this the enemy speed could be set and automatically allowed for in the mechanical vector triangle previously described. Three types "A", "B" and "C" were produced, the latter two being specially calibrated in knots for Fleet Air Arm and Coastal R.A.F. squadron use. Various small improvements were also incorporated and resulted in a highly efficient instrument giving, in practiced hands, astonishingly accurate results. However, it must be remembered

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(1) During this 10 year period, there were special Marks III and IV introduced for use in airships and two Marks (V and VI) using lighter metals in an endeavour to cut down weight but none of these lasted any time in Service.

that Practice Camp and even Target Ship conditions were very artificial.(1)

The Air Ministry Laboratory was finally disbanded in 1932 after it had produced its last variant of the C.S.B.S., the Mark VIII, and thereafter new sight design was largely in the hands of the Instrument Department of the Royal Aircraft Establishment (R.A.E.) at Farnborough. Here was designed in 1937 the Mark IX C.S.B.S. which, beside replacing the trail angle setting by a known "terminal velocity" constant marked on the relevant height scale, introduced the automatic orientation of the sight by means of an electrically controlled "Distant Reading Compass". However, no amount of ingenuity could avoid the necessity of an absolutely level position being maintained by the aircraft during its run up to the target which called for extremely accurate flying and intense concentration on the part of the pilot. The desirable "flat" turn when tracking alterations of course were being made became increasingly difficult with the advent of the higher performance aircraft which started to appear in 1937 and it became imperative to allow for a "banked" turn. This not only prolonged the length of the run-up so that the aircraft could be accurately settled but added to the bomb aimer's already complicated last minute tasks. An attempt to assist in these was the fitting of the whole sight in an azimuth bracket which could thus be rotated on its own axis.

A final effort to simplify matters was made early in 1939 by the designing of an entirely new sight - the Mark X. This embodied many so-called improvements but converted the C.S.B.S. into an instrument so unwieldy as to be impracticable and like its predecessor (the complete Mk.IX) did not come into service. The unmodified Mark IX C.S.B.S. was the standard instrument in general use in the R.A.F. bomber squadrons at the outbreak of the Second World War.

(d) Bomb releases and the introduction of Bomb Distributors

By the end of the 1914/18 War the release of bombs was done by the pilot or bomb aimer pulling on a length of wire attached to a release hook. With the postwar increasing size of aircraft the old vigorous tug on a long wire became impracticable and there had to be substituted the relatively feeble pull of an electromagnet; furthermore, the progress in bomb sighting made it essential that bombs should be released with certainty and instantaneously. Many designs were tried, including a small electrically fired cordite cartridge device, but it was 1931 before a reasonably satisfactory electromagnetic release gear was produced. Under the varying service conditions of weather and temperature numerous modifications were found necessary in succeeding years and it was not till 1934 that a standard release gear was introduced into service. Even then it still meant that each bomb had to be released separately.

Early in 1931 Air Marshal Sir Edward Ellington (A.O.C.-in-C. A.D.G.B.) had written to the Air Ministry suggesting a bomb release gear which could drop bombs at timed

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(1) Average bombing errors of 50 yards from 10,000 feet were a normal achievement, whereas under war conditions even as late as 1943 errors of 200 to 300 yards were the common order.

intervals after the initial release by the pilot or bomb aimer, so producing a line of bomb bursts at stated distances apart on the ground. This was the first appearance of the Stick Bombing technique and was envisaged by the A.O.C.-in-C. as of particular use to ensure at least one hit out of ten bombs aimed at a narrow target like a bridge or a railway line.

This release gear was called a Bomb Distributor and the first instrument was designed and completed by the Royal Aircraft Establishment (R.A.E.) in October 1931. It was constructed from automatic telephone apparatus and had a speed range of one bomb in two seconds to eight bombs a second. It was issued to No. 12 Squadron on Hart bombers for trial in February 1932 but, although partially successful in operation, was found to be too unreliable. After many modifications a completely new design was undertaken by the manufacturers. Before completion, there was an Air Staff requirement in January 1934 for an automatic distributor capable of being operated by a push button on the pilot's control column which had to drop bombs in a stick, or to release bombs singly, or to release all bombs together. It was not until April 1935 that a prototype was ready and in its first form (Type IV A) it was found to be too bulky. Moreover, a further requirement was now added that it had to be capable of movement from the pilot's position either to the prone position of the bomb aimer or to the air gunner's firing position. This all meant considerable modification and redesign of components which was increased before completion by yet another requirement to release successive sticks of eight bombs up to a maximum of four sticks.

The first unit of the new Type V automatic bomb distributor was forwarded to the R.A.E. for examination in June 1937. However, the accuracy of bomb spacing was very poor and the delay setting inaccurate and unreliable. Another re-design was discussed at a Joint Service Conference on 26 October 1937. At this meeting the Naval Staff stated their requirements which were for a total of 16 bombs, no delay, and an accuracy of 15 per cent. It did not appear possible that one distributor model could be made to meet the different requirements of the Air and Naval Staffs but at the end of the year these respective requirements were radically altered and it was found that by differing the calibration the separate needs of the two staffs could be met on the one model.

By January 1938 the drawings of a redesigned instrument had been prepared and in due course a type trial was carried out. Reports on this indicated that the apparatus was satisfactory and production was recommended. However, on further consideration it was decided that the rather specialised character of the component parts were not susceptible to quantity production. As an alternative, a distributor on the automatic telephone principle, which could easily be produced on standard telephone components, was proposed and accepted.

A prototype of this design was ready for trials in October 1938 and these confirmed the instrument to be accurate, easy to manipulate and robust in construction. After minor modification, the distributor (Type VI) was recommended for introduction into service in November 1938 and in 1939 was the standard fitment in all bombers. It should be noted, however, that no form of bomb distributor had been fitted before the outbreak of war to any of Coastal Command's maritime squadrons

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with the exception of the one American type Hudson squadron who had but nine of the Type V distributors.

(iv) The effectiveness of naval anti-aircraft gunnery

As in the cases of bomb and torpedo attacks by aircraft against ships there had been little or no experience from the 1914/18 War upon which to base opinion of anti-aircraft fire. From 1923, air torpedo attack had been frequently exercised against the Fleet at sea, albeit under unrealistic conditions, while bombing was confined to infrequent experimental trials against the target ship Agamemnon under even more unrealistic conditions. Over both methods of attack hung the uncertainties of naval anti-aircraft gunfire and it was inevitable that the air and sea protagonists should advance widely differing opinions. Attempts had been made to prove its effectiveness by examining the results of A/A fire at targets towed by aeroplanes. In England these trials had been few up to 1924. The annual allowance of ammunition for high angle gun practice in battleships and cruisers was only 40 rounds per gun, increased late in 1924 to 80. A test firing in November 1924 by H.M.S. Castor against a sleeve target towed at 2,500 feet was reported by a naval observer to have resulted in no material damage at all to an aeroplane in the position of the target. In America, there was a much advertised firing by their fleet in March 1925 at sleeve targets towed at 6,000 feet. No hits were recorded by the 880 rounds fired.

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In March 1926 the Air Staff produced a memorandum on the subject. After recapitulating the results of trials up to date they came to the conclusion that, with uncertainties such as the three dimension movement of aircraft, the small "fatal zone" of shell, the high speed approach of the relatively tiny target, and the mounting of the A/A guns on unstable ships' deck platforms, the chance of A/A gun success was highly problematical but they granted that it was likely to be greater in countering air torpedo attack than against bombing attack. Further exercises during 1926 and 1927 by high angle and turret guns using shell and shrapnel against sleeve targets and gliders implied that slight improvement in marksmanship was taking place but the Admiralty's main interest was focussed on the 2 pdr. pom-pom.

The development of the multi-barrel Pom-Pom was recommended as early as 1921 by the Naval A/A Gunnery Committee. This committee had been constituted in 1920 and included Air Force representatives. During the next six years many experiments on a trial weapon were conducted by the Ordnance Committee in connection with the mechanical development and in September and October of 1927 some full scale firing practices were carried out against glider aircraft at low altitudes. There were 11 glider runs during which most of the firing was done at between 500 and 1,000 yards range with the ship stationary. No hits were registered by the 260 rounds fired. Such results hardly substantiated the current Admiralty claims of "considerable increase in accuracy of A/A firing" and "the steadily growing power and accuracy of A/A armament".

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At the beginning of 1928, the naval estimates for the ensuing year were under discussion with the Treasury. The Admiralty had included an item of £163,000 as a first instalment towards full scale production of the Mark M

multiple pom-pom to arm all the ships of the Fleet, the probable ultimate total cost being £3<sup>1</sup>/<sub>2</sub> million. The Treasury took the view that it was necessary to know more about this proposal before sanctioning such expenditure. Unofficially they got into communication with the Air Ministry on the subject who replied that expenditure on this scale should certainly not be embarked upon until the proposal had been examined by the Air Staff and more particularly by the Army General Staff who knew far more about anti-aircraft matters than the Admiralty.

At a Cabinet meeting in February 1928, attention was drawn to the Admiralty proposal for expenditure on a weapon that had not been tested in concert with the Air Ministry and it was suggested that the merits of this weapon should be discussed by the Committee of Imperial Defence. However, in a minute to the Treasury dated 8 May the Admiralty maintained that they alone were competent to advise the Government on the counter to a form of attack, i.e. torpedo aircraft, to which ships alone were open. To this the Chancellor of the Exchequer replied that the question must be referred to the Committee of Imperial Defence and it was brought up for discussion at their 237th Meeting on 10 July 1928. In spite of positive claims put forward by the First Sea Lord it was decided after considerable discussion that the Admiralty must produce further evidence before the gun went into general production but it was agreed between the Admiralty and Treasury that twelve guns with the minimum of ammunition would be provided at a cost of £339,000 spread over three years. It was expected that the guns and mountings would be delivered by October 1930.

Subsequently, on 8 August 1928, the Air Ministry received the report on the gun trials carried out earlier between April and June of that year. This showed that the weapon was in fact by no means as satisfactory as the First Sea Lord had made out at the meeting mentioned above. The recorded results were that 8,834 rounds had been fired under the easiest possible conditions from a stationary ship at the simplest form of glider and sleeve targets and only 26 hits were obtained of which 14 were by splinters only. Thus, even counting splinter hits, which would probably not have harmed an aeroplane, the percentage of hits was only 0.32%. Moreover the five naval officers who formed the Trials Committee were by no means impressed either with the infallibility or perfection of the weapon. They did, however, claim it to be superior to any other weapon available but rightly concluded that until a more suitable and realistic target was provided there was a grave danger of false conclusions being drawn.

Regarding the provision of a more realistic target, the Air Ministry Research Department had been constantly occupied since 1920 in the endeavour to develop a wireless or automatically controlled target.(1) Trials of certain types, which had been witnessed by the Admiralty in 1925 and again in 1928, had shown that so far they did not meet requirements. Though experiments were still progressing, it was felt by the Air Staff that there was little chance of ever getting a radio-controlled aircraft which would at all accurately simulate air torpedo attack but there was every possibility of one which

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(1) The idea of a radio-controlled target aircraft for use in naval A/A exercises was first suggested by the Air Ministry to the Admiralty in April 1920.

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C.I.D.893-B

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could represent a bombing attack. The final trials of such an aircraft took place in March 1935 and were completely successful - the aircraft flew for 39 minutes and obeyed 43 control signals from H.M.S. Castor. This first type to be produced was the Fairey Queen and an improved model was given the name of Queen Bee which became the accepted designation for the type. However, up to 1929 the possibilities of effective naval A/A fire were mere expressions of opinion unsupported by any reliable evidence.

(v) High Altitude bombing gets a new lease of life

The climate of opinion regarding the merits of different forms of attack which had been expressed by the Air Staff appreciation dated May 1928 underwent a drastic change between the years 1929 and 1935. The first signs of this came in 1929 with the introduction of the Mark VII Bomb Sight fitted with a fourth vector which allowed a setting for the speed of a target ship. This year also saw the provision of the battleship Centurion in place of the Agamemnon. The new target ship was equipped with full radio-control, could steam faster and make frequent alterations of course and speed.

The first Centurion trials took place during September 1929 off the Humber and were done by Nos. 7 and 207 Sqdns. on Virginia and Fairey III F bombers respectively and using the new Mk. VII 4th Vector Bomb Sight. Both individual and formation attacks were carried out from 3,000 to 6,000 feet on the Centurion who steered a steady course at constant speed for half the trials and on zig-zag courses at varying speeds for the other half. In fact there was little difference in bombing results under either set of conditions. In all, there were 152 bombs dropped in individual attacks of which 19% hit and 156 bombs released in formation salvo bombing which secured 17% hits. These results, were so superior to any obtained in previous years under easier conditions that interest was once more directed to high altitude bombing.

No trials against the Centurion were conducted during 1930 but another series took place in September 1931. The bombing was done by Nos. 7 and 101 Sqdns. on Virginia and Sidstrand bombers, again using the Mk. VII Bomb Sight. Attacks took place from altitudes between 4,000 and 6,000 feet and the Centurion varied her course and speed throughout the trials. The 95 bombs dropped individually secured 30% hits and for the 162 bombs dropped in formation salvos the hitting percentage was 34. This represented another impressive increase in accuracy. For the first time, and in a separate trial, 18 B-bombs were dropped ahead of the Centurion from 300 feet. It was estimated by the target ship that nine of these came up and struck the bottom of the ship but positive confirmation was not obtained owing to the failure of the batteries activating the audible hit device in the bombs.

No trials at sea were done in 1932 and in September 1933 a more ambitious programme was undertaken. There was high altitude precision bombing in salvos from 9,000 feet by three aircraft in very close formation, high altitude pattern

A.H.B.  
IIA/1/4  
encls. 31 & 38  
also  
ID2/90

ibid  
encl. 47

See  
Appendix VIII

bombing(1) up to 16,000 feet by a whole squadron, dive bombing at 45° with release at 1,500 feet and B-bombing ahead of the target ship which was taking full avoiding action throughout the trials.

Four bomber squadrons took part and the results were as under: -

Squadron	Nature	Dropped	Hits	Percentage
No. 12 (Harts)	Pattern bombing 8,000 to 16,000 feet.	11 Salvoes (456 bombs)	6 (12 bombs)	55 (3)
No. 101 (Sidestrands)	Precision bomb- ing 8,000 to 9,000 feet.	195 bombs	38	20
No. 33 (Harts)	Dive bombing release at 1,500 ft.	334 bombs	128	38
No. 40 (Gordons)	B-bombing	No hits as all bombs were dropped too far ahead of the target.		

These trials showed that, although over 50% of the patterns straddled the target, it was as yet a wasteful method of securing a few certain hits. The highlight was the accuracy of dive bombing but it was realised by the Air Staff that this method did not ensure sufficient velocity to penetrate the deck of a modern battleship.(2) It was also noted that

- (1) Pattern bombing was done by the Squadron aircraft flying at pre-arranged bearings and distances from each other with simultaneous release of bombs on a signal from the leader. The resultant pattern of bombs was intended to fall around the target and ensure at least one certain hit. It was the precursor of stick bombing which could not be introduced until a reliable Bomb Distributor had been developed.
- (2) It was after these trials that the Admiralty definitely gave up high bombing in the Fleet Air Arm in favour of dive bombing. Among the reasons leading to this decision were:-
  - (i) Dive bombing promised a much greater number of hits with the minimum of training.
  - (ii) The torpedo plane was the only type capable of carrying heavy bombs and no suitable bomb sight for this small aircraft had been developed. Consequently the accuracy was unsatisfactory and even with hits by a 1,000 lb. bomb there was no guarantee of penetration against the modern deck armour of a capital ship.
  - (iii) It seemed wiser to have nothing larger than a 500 lb. bomb, of which more could be carried, and rely on the greater accuracy of dive bombing which, while giving no great armour penetration, would give a better probability of damage than high level heavy bombing in the absence of necessary equipment.

A.H.B.  
ID2/90 and  
IIA/1/4  
encl. 55

the precision bombing results from the increased height were not so good.

ibid  
encl. 56

After some desultory correspondence between the Admiralty and Air Ministry on the conclusions to be drawn, a further set of trials took place in September 1934. The conditions were much the same except that precision bombing was modified in favour of a distributed salvo, (1) the height of release for 45° dive bombing was increased to 2,000 feet and a more scientific pattern was adopted for the pattern bombing. Again four squadrons took part and the results were as under:-

Squadron	Nature	Dropped	Hits	Per-centage
No. 12 (Harts)	Pattern Bombing 10,000 to 14,000 feet.	24 Salvoes (287 bombs)	12 (22 bombs)	50 (7.5)
No. 101 (Sidestrands)	Distributed Salvo 10,000 feet.	18 Salvoes (182 bombs)	6 (6 bombs)	33 (3.3)
No. 57 (Harts)	Dive bombing release at 2,000 feet.	296 bombs	53 bombs	18
No. 40 (Gordons)	B-bombing	18 Salvoes (230 bombs)	7 (5 bombs)	39 (2)

A.H.B.  
ID2/90

It was noted that the better pattern bombing bomb hits were due to the adoption of an improved scientific pattern giving more bomb hits when a straddle was obtained. The distributed Salvo method had a good straddle percentage but as poor a bomb hit percentage as the old unscientific pattern. The increased height of release had an adverse effect on dive bombing accuracy and although the B-bomb Salvoes were estimated as 39% correctly placed, the underwater time of the rising bomb was obviously erratic.

During these years since 1930 the other absorbing subject, that of A/A gunnery, had been developing within the Navy. From time to time memoranda and statistics were forthcoming which claimed an ever increasing efficacy of long range medium calibre High Angle gunfire and the close range multiple Pom-Pom fire. The arrival in March 1935 of the radio-controlled Queen Bee target aircraft stimulated both firing practices and increased claims of effectiveness alike. Another kind of food for thought was provided by the naval constructors who were fitting battleships with side "blisters" designed to render the ship impervious to as many as six torpedo hits. By this time, in naval theory, the battleship was immune by her A/A fire, her deck armour and her blisters to all forms of air attack. Coming from such responsible sources the Air Ministry was bound to be influenced to some degree if only by the constant repetition of this theme. Although unconvinced by the claims of naval A/A fire against high altitude bombers, they were aware of the easier target presented by the torpedo plane and took serious note of the protection afforded to the battleship by blisters.

(1) There was now available in small numbers the first type of Bomb Distributor but it was still in course of modification owing to its erratic performance.

There were no Centurion trials in 1935 but by now the Air Staff was reaching out towards a consistent theory as to the best tactical methods of attacking capital ships. These tactics were liable to constant change under the influence of the rapid development of aircraft design and equipment and because the opportunities for testing them under conditions even remotely resembling those of actual war were limited. Up to date the Air Staff had regarded the Agamemnon and Centurion exercises not so much as trials to advertise the accuracy of bombing but rather as a means of developing new methods and of giving training to a limited number of squadrons.(1)

The following methods for the attack of capital ships from the air were advocated by the Air Staff at the end of 1935 and in this order of preference:-

1. High Altitude Level Bombing

This involved the dropping of armoured piercing bombs from heights of 10,000 feet or above with the assistance of a precise bomb sighting apparatus. Bombing from a great height was necessary in order to achieve penetration of deck armour and could only be done when the cloud base was high enough. A particular form of this attack was pattern bombing. This was still in the experimental stage and at present was uneconomical but was peculiarly suited to the attack of "line targets" such as capital ships. It involved the mathematical distribution of bombs around and on the target so as to obtain the greatest probability of securing at least one hit from each pattern dropped. The particular distribution in pattern could be obtained by either the use of a bomb distributor or by aircraft flying in close pattern formation and releasing their bombs on a signal from their leader or by a combination of both these means.

2. Dive Bombing at 45°

This was a method of attack by releasing bombs on the dive after an approach at altitude. It could be employed when cloud or other visibility conditions ruled out the possibility of high altitude bombing. Either S.A.P., G.P., or B-bombs were released on the dive by the pilot's judgement at heights from 1,500 to 2,000 feet. Against capital ships it was designed to silence A/A fire, to disorganise controls and communications, and to lower the fighting efficiency of the ship as a whole. It could be used to cover simultaneous high level bombing and torpedo attacks. Among the advantages of this method were its greater immunity from long range naval A/A fire because no straight or level run-up to the target was required, it offered greater opportunities for initial surprise, and it undoubtedly was more accurate when properly carried out. The

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(1) Pattern and Precision Bombing were done by Nos. 12 and 101 Sqdns. The squadrons specialised on dive bombing were Nos. 18, 33 and 57 (all on Harts) and F.A.A. No. 800 Sqdn. on Nimrods and Ospreys.

disadvantages were loss of penetrative effect against deck armour, its accuracy varied with the steepness of the diving angle achieved, and the unsuitability for it of the modern large fast type of bomber then coming into service which meant that a specialised type would have to be developed.

3. Torpedo Attack

Attacks on warships by aircraft equipped with torpedoes were the normal role of Fleet Air Arm aircraft but in time of war the torpedo bomber squadrons of Coastal Command would also be required for this work. In recent years, however, the sides of capital ships had been, according to naval report, adequately protected against the torpedo by specially fitted bulges. Moreover, again on naval report, the full weight of long and close range A/A defences could be brought with more chance of success against an aircraft which of necessity had to approach the ship to within 1,000 yards in level flight at wave-top height before releasing the torpedo. Torpedo dropping called for highly specialised training and required the development of yet another special type of aircraft. Under these conditions the Air Staff had revised their previous high opinion of this weapon.

It is interesting to note that the Naval Staff reversed the order of importance of these three types of attacks. It must be remembered, however, that the Naval choice primarily applied to the Fleet Air Arm employed against enemy ships who were not credited with the same advance in defence as claimed for our own battleships. On the otherhand it seemed illogical to play down any threat by a British shore-based air force to an enemy fleet by reference to their own supposed perfection of defence.

Actually, trials and experiments were quoted in support of both schools of thought. Staff arguments were echoed by the Departmental Heads as instanced by an exchange of letters during February 1936 between the Secretary of State for Air and the First Lord of the Admiralty. Lord Swinton maintained that the only evidence so far produced in favour of naval A/A gunfire had been trials at towed targets and the Queen Bee target. The former were of very limited value and the latter could not be flown at more than 85 m.p.h. Even at this slow target, the results showed that it was doubtful if it could be hit within the very short critical period of an air attack. How much more, therefore, was it unlikely that hits could be secured against modern machines travelling at 250 m.p.h. Regarding bomb effects on hull construction, there had been some experiments with a full charge 250 lb. bomb but none with a 500 pounder. A dummy 500 lb. A.P. bomb had given evidence of its penetrative power but of course none on its destructive effect after penetration.

To this the First Lord replied that, although full charge 500 lb. bombs were not dropped on a target ship, two were placed in the Marlborough in positions to which it was expected they would have penetrated and the detonations did surprisingly little damage. Others were tested at the

A.H.P.  
ID/3/6

Shoeburyness range by being fired out of a mortar against armoured plates at angles and velocities corresponding to various heights. These showed that whereas a 15" S.A.P. gun-shell would pierce 8 to 9" of armour, a 500 lb. A.P. bomb dropped from 8,000 feet would only penetrate  $3\frac{1}{4}$ ". In an experiment against the "Chatham Float" it showed that if a bomb did succeed in penetrating to a shell room or magazine, one or possibly two compartments would be opened to the sea but this was not catastrophic - it was comparable to striking a mine, which a capital ship was designed to sustain. As to naval A/A gunnery, a flight of heavy bombers would present 10 or 20 times the target of a Queen Bee. Although the maximum long range A/A armament was now only 4 - 4" guns on a broadside, the new capital ship would have a broadside of 8 - 5.25" guns with a far higher muzzle velocity. For close range the new multiple Pom-Poms would have a nearly halved time of flight up to 2,000 yards. With these weapons the Admiralty confidently expected to achieve effective A/A defence.

Lord Swinton returned to the charge with a quotation from a recent Admiralty trials report in which it was stated that, if dropped from 3,500 feet or higher, a 500 lb. A.P. bomb would penetrate all the Marlborough's decks and go out through the bottom. Hence apparently the reason for the earlier omission to try out this bomb. There was, he said, still no first hand evidence (other than calculation) of what penetration we should get from 8,000 feet upwards on a modern armoured capital ship nor what would be its explosive effect subsequently. The bombs "placed" in the Marlborough were assumed to have penetrated only a very short distance. Instead of all this theorising, would it not be better to conduct real live trials.

(vi) The 1936 Sub-Committee on the Vulnerability of Capital Ships

Down to 1935 the problems of the vulnerability of capital ships to air attack had been a technical problem solely the concern of the Naval and Air Staffs. When the rise of Fascism had become more menacing and when disarmament as an international safeguard against recurrent wars had proved a failure, politicians began to interest themselves in the future fate of the battleship. The first White Paper on Defence (March 1935) had explained that when our existing battleships were designed the advent of air attack in its modern form had been unforeseen but it pointed out that "their anti-aircraft armament is being increased to enable them to perform their primary function". Its conclusion was that "in the Main Fleet the capital ship remains the essential element upon which the whole structure of our naval strategy depends".

What brought the "Bombs versus Battleship" controversy into the forefront of public discussion was the Italo-Abyssinian War of 1935/36. The withdrawal of British naval units from Malta and the position of the fleet exposed at Alexandria, at a time when war with Italy had seemed imminent, provoked an agitation in Parliament and the Press. Whatever may have been the strategic reasons for these naval movements, attention was focussed on the question of the capital ship's vulnerability to air attack and hence to the fundamental basis of our system of Imperial Defence. A further stimulus to discussion was given by the Government's proposal,

Cmd. 5107  
para. 25

announced in the second White Paper on Defence of 3 March 1936, that two new capital ships would be laid down early in 1937.(1) Before this programme could be discussed dispassionately it was essential that some authoritative pronouncement should be made on the respective merits of the arguments for and against the capital ship.

The Prime Minister (Mr. Stanley Baldwin) accordingly appointed a special sub-committee of the Committee of Imperial Defence on 26 March 1936 and instructed it "to consider the experiments that have taken place or are proposed in connection with the defence against aircraft and the vulnerability from the air of capital ships."(2) Between 31 March and 9 July the sub-committee held nine meetings. The first four were devoted to hearing the evidence of Service experts and in the rest the sub-committee considered the views of distinguished high officers and the more vociferous members of the "anti-battleship" school.

In advocating the retention of the capital ship the Naval Staff submitted evidence to show that:-

- (i) The views of the popular critics should be rejected.
- (ii) The air menace to the capital ship could be adequately countered by naval A/A fire.
- (iii) The capital ship of the future could be given sufficient deck armour to ensure that fatal damage from the air could be avoided.
- (iv) The battleship was indispensable for the defence of Imperial territory and seaborne commerce.

The First Sea Lord,(3) in his evidence, had no difficulty in refuting the misinformed and often irresponsible Press and Parliamentary critics, which included mistatements on the recent naval strategy in the Mediterranean, exaggerations of previous bombing trials in America, and the specious argument based on the relative high cost of the battleship. The popular theory of the danger of the "near miss" bomb was also rejected as Admiralty experiments to test such explosions close to a ship's side had confirmed that they were not a vital menace to a modern battleship protected by the bulges constructed to ward off damage by torpedo attack.

Regarding (ii), the Naval Staff, relying on the progress made in the science of naval A/A gunnery, made a confident claim that it would soon have the measure of the air menace to the capital ship. Details were given as to the amount of extra deck armour which was to be provided in the new capital ships. This was shown, from recent trials with heavy A.P. bombs, to be more than adequate to satisfy heading (iii).

Admiralty  
Paper B  
in  
A.H.B.  
ID2/90

Admiralty  
Papers C  
and D

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- (1) The London Naval Agreement, which prohibited the building of new capital ships, was due to expire on 31 December 1936.
  - (2) The members of the Sub-Committee were:-  
Sir Thomas Inskip (chairman), Viscount Halifax, Mr. Malcolm MacDonald, and Mr. Walter Runcimen. The First Sea Lord and the Chief of the Air Staff acted as expert advisers. A large number of ex-service witnesses attended before the sub-committee or submitted memoranda.
  - (3) The First Sea Lord and Chief of the Naval Staff was Admiral Sir Ernle Chatfield.

Admiralty  
Paper A  
all in  
ID2/90

Finally, the Admiralty claimed that any Imperial Defence policy based on the absence of the capital ship would result in disaster.

V.C.S. Paper  
No. 22

Of great interest were the views of two responsible and distinguished officers, Sir John Salmond and Lord Trenchard, both former Chiefs of the Air Staff. Sir John was sceptical as to the vulnerability of capital ships to air attack, not because of any A/A defence fire but because he thought it unlikely that aircraft could attack in sufficient numbers to obtain the very numerous bomb hits necessary to sink a battleship. Moreover, only from great heights could armour piercing bombs have a hope of penetration. Low bombing and dive bombing certainly would not do so though they should cause a loss of efficiency in fighting qualities. He concluded with the words "as far as I am aware, the capital ship is the one remaining surface craft which, if hit severely, will not sink. In my opinion it should have a useful life for sometime to come in spite of the increasing range and power of the air arm".

V.C.S. Paper  
No. 19

Lord Trenchard gave no definite opinion on the possibility of sinking a battleship but he drew attention to the various ways in which the action of the main Fleet would be restricted by the advent of air power in that all its dispositions and movements might be governed by that factor. He also pointed out that attack from the air might well prevent capital ships from continuing as effective fighting instruments by compelling lengthy refit and repair. He also stressed the difficulties which the threat of air attack would impose on the Admiralty in its search for secure fleet bases. A powerful Navy was, in his opinion, essential to the prestige and unity of the British Empire and there were many essential functions in the protection of our commerce which could only be discharged by appropriate naval forces. He doubted, however, whether capital ships were indispensable for the discharge of those functions and considered that the Government should not lay down two new battleships but should concentrate on an increased provision of aircraft, cruisers, destroyers, submarines and motor torpedo boats.

V.C.S. Paper  
No. 5

The views of the Air Staff were expressed in a memorandum dated 15 April 1936 by Air Chief Marshal Sir Edward Ellington, Chief of the Air Staff. In the main this criticised in detail the evidence given by the First Sea Lord and contained in the various Admiralty Papers.(1) It accepted the position that the essential need for the capital ship had arisen from the necessity of providing "general cover" for the cruisers and lighter naval craft engaged on patrol or close escort duties. But it drew attention to the way in which threats to the capital ship had been accumulating and even before the advent of air power they had to be protected at sea by whole flotillas of destroyers, minesweepers and cruisers. The Air Staff had not sufficient confidence in the efficacy of naval A/A fire to agree with the Admiralty that the new threat of air attack could be neutralised with the same success as that from the torpedo boat, submarine and mine.

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(1) Amongst these was a totally unwarranted accusation by the Admiralty that the Air Ministry had obstructed the development of the target aeroplane and the Mark M Pom-Pom. Ref. Admty. Paper C and C.A.S.'s replies - both in A.H.B./ID2/90.

They contended that aircraft would not suffer sufficient casualties from A/A fire to prevent their attacks on the Fleet from being effective. By this they meant, not that battleships would necessarily be sunk but that their fighting efficiency would be so impaired as to make it necessary to send them back to base for lengthy repairs. If this estimate proved correct, the naval reaction would in all probability be to keep the Fleet withdrawn at all times beyond the range of heavy air attack. With the Fleet restricted to this extent, the risk appeared to be real that capital ships would not be able to fulfil their traditional role in sea warfare.

A.H.B.  
IB/3/24

(vii) The Sub-Committee's Report - C.I.D. 4258-B

After lengthy and detailed examination of the mass of conflicting evidence the Sub-Committee made its report on 30 July 1936. It was hardly surprising that the opinions of the "anti-battleship" school were rejected. Such "air enthusiasts" as had given oral evidence had not been impressive under cross-examination. The ground was cleared by dismissing all arguments based on the earlier American experiments, on the alleged vulnerability of capital ships to the "near miss" bomb, and on the high relative cost of battleships. Attention was then concentrated on the two main technical problems - bombing accuracy and the efficacy of naval A/A gunnery. In neither was any firm conclusion drawn since the experiments so far conducted had been subject to a peacetime unreality which inevitably made agreement between the Naval and Air Staffs impossible.

As far as bombing accuracy was concerned, there was inter-service concurrence on certain statistics derived from the Centurion trials. The probability of bomb hits for high altitude level bombing was recorded as 11% and for dive bombing as 27%. These figures were, however, largely academic and the Sub-Committee felt unable to give judgement as to how far these would be altered by more realistic conditions.

Even more difficult to assess were the probable results of A/A gunfire. Those so confidently expected by the Naval Staff could not be accepted because of the difference between the slow unrealistic Queen Bee targets and the fast modern aircraft which would have to be engaged in war.<sup>(1)</sup> Nor could the Sub-Committee have any confidence in the method of estimation when the length of the level "run-up" before bomb release was in dispute between the Naval and Air Staffs. (With the new automatic bombsight the Air Ministry claimed that the time of this could be reduced to 20 seconds whereas the Admiralty doubted this and estimated at least 90 seconds). The Sub-Committee therefore considered that the unreal conditions, although unavoidable, made it difficult if not impossible to accept any figures of probable hits and casualties until much more information was available. The same conclusion applied to dive bombing trials and figures. On the question of

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(1) The Queen Bee targets had less than a third of the speed of modern aircraft, its speed was a known constant and, owing to their cost, they had to be manoeuvred more with a view to giving training and to avoid damage rather than act as an expendable store to be shot down if possible.

ammunition supply for the A/A guns, they urged immediate investigation in view of the immense amount it had been disclosed that was expended during relatively few and short periods of action.

In these circumstances the strategical factors stressed by the Admiralty were decisive in determining the Sub-Committee to recommend that the capital ship should not be abandoned. We had more to lose, the report said, by making a false decision in so vital a matter than had any other power. The information at present at their disposal led them to believe that the day of the capital ship was not over, now or in the near future. "The advocates of the extreme air view would wish this country to build no capital ships, other powers still continuing to do so. If their theories turn out well founded, we have wasted money; if ill-founded, we would, in putting them to the test, have lost the Empire".

The Report prefaced the summary of its views with a strong recommendation that further experiments to test the vulnerability of capital ships should be carried out and gave a detailed list of specific trials desirable. It also stressed the need for making these experiments as realistic as peacetime conditions would allow and that the provision of funds and material to this end should not be stinted.

The Report was considered and approved by the Committee of Imperial Defence at its 282nd meeting on 8 October during which it was suggested by the First Sea Lord that the further trials should be supervised by an impartial scientific committee whose duty should be to ascertain the facts and deductions to be made from the experiments and act as assessors in cases where professional opinion might differ. The Report and this suggestion were approved by the Cabinet on 14 October 1936.

A White Paper summarising the Report was issued and considered by Parliament in November. This was criticised in a thoughtful leader in the Times newspaper on 6 November which displayed considerable foresight of subsequent events in the 1939 war. While agreeing that the many elements of doubt on technical and tactical issues increased the difficulties of the Sub-committee in studying the broader issues of strategy, the article found the sub-committee's final remark a little too simple. There was no true dividing line between technical, tactical, and strategic values. Although the Sub-Committee did enter the field of strategy, the extent of such entry was too limited. We had been in peril of losing the war in 1917, although we had then a far larger battle-fleet than now in 1936, because of the havoc that a comparatively small number of submarines played on our trade routes and because the destroyers which were wanted to combat that threat were being kept to safeguard the battle-fleet. The Sub-Committee had remarked that "in the absence of a powerful British Fleet it would not be impossible for the capital ships of a hypothetical enemy to place themselves without interference across our trade routes". Yet it was well to consider the degree of this possibility and to remember the difficulty of "placing" a battle-fleet at a great distance from its bases. Again, what powers were there who possessed battleships that could be used for this purpose? Two of them lay at distances which seemed to minimize the possibility of interrupting any vital route. The others lay in landlocked areas from which emergence would be very hazardous in face of strong flotilla and air forces. If there

Cabinet 57 (36)

Cmd. 5301

A.H.B.  
IIA/1/4  
encl. 59

ibid

was one outstanding feature of the last war at sea it was the general reluctance to hazard irreplaceable battleships in waters where submarines might be lurking thereby imposing a marked strategic limitation on the use of battleships. Those hazards were multiplied today by the development of aircraft and high speed motor torpedo boats. Was there a serious chance that hostile battleships would face them and venture on to trade routes remote from their bases?

ibid

Taking the case put forward by the sub-committee, it was known that the navies of today were striving to increase the speed of their battleships - what if we were to find, too late, that the enemy's battleships outpaced ours and were able to sweep the trade routes without being brought to battle? Might we not regret that the money spent on new battleships had not been invested in more aircraft carriers and flotilla craft? The whole question of future war was shrouded in uncertainties, deeper now than ever before. But if we do decide that the safer course is to build battleships it was well to realise that the insurance premium was high compared with the risk and in covering this risk we would be taking a risk in other aspects of the strategic issue since the total money that could be devoted to defence was not unlimited.

(viii) The last series of Organised Bombing Trials - 1937/38

A.H.B.  
ID2/90

It will be remembered that in the approval by the Committee of Imperial Defence there was a recommendation that the Naval and Air Staffs should arrange between them for a further series of trials which, it was hoped, would approximate more closely to war conditions, and that the Admiralty and Air Ministry should co-operate in the selection of impartial assessors in cases where professional opinion might differ. This resulted in the establishment on 23 February 1937 of a scientific Sub-Committee of the Committee of Imperial Defence.(1) It was under the auspices of this sub-committee of "Assessors on Bombs versus Battleship Experiments (A.B.E.)" that the final series of trials in 1937 and 1938 were conducted.

A.M.  
S.39451  
encl. 13A  
and  
S.41137  
encl. 50A

The actual arrangements were the joint responsibility of the Admiralty and Air Ministry and the first series of trials were intended to throw more light on the value of level and dive bombing and the length of time necessary for aircraft to be on a straight course before dropping a properly aimed bomb. From the Air Ministry side they were arranged by Air Commodore W. Sholto Douglas (D.S.D.) and on his initiative a joint ad hoc committee of naval and air representatives was formed to discuss the programme of trials. At their first meeting on 22 April 1937 it was decided that the schedules of exercises should be in two parts - Phase I for trials in 1937 with Hinds and Heyfords using the course-setting bombsight and Phase II at a later date with modern aircraft using both the

A.M.  
S.40054  
encls. 9A  
and 72B

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(1) The Chairman was Lieut.-General Sir Hugh Elles (Master-General of Ordnance), and the scientific members were Sir Frank Smith (Department of Scientific and Industrial Research), Sir Henry Tizard (Imperial College of Science and Technology), and Professor R. H. Fowler (University of Cambridge). The title was altered on 14 March 1938 to sub-committee on Bombing and A/A Gunfire Experiments.

course-setting and automatic bombsights.(1) It was further decided at an Air Ministry meeting on 29 April that the trials should be carried out by a small number of specially trained and screened squadrons of No. 1 Group Bomber Command.

After the draft schedules had been circulated to the Admiralty and the A.B.E. sub-committee, they were finally approved on 21 May. Meanwhile on 14 May Bomber Command had nominated No. 15 Sqdn. (Hinds) for the dive bombing, No. 40 Sqdn. (Hinds) for level bombing and a flight of No. 101 Sqdns. (Overstrands) for the run-up tests. The final arrangements and operational procedure for the Bombing Trials 1937/38 were approved by the A.B.E. sub-committee on 18 June. The sea exercises against the Centurion were not fixed in their final form till 20 July.

Although practice started on 21 May, the actual tests were not begun at Abingdon and Otmoor bombing ranges until 9 June and were not completed till the middle of April 1938. This slow progress was very largely due to the frequent periods of weather conditions when accurate bombing from heights of 10,000 feet and over was impossible and it was not irrelevant that No. 15 Sqdn. was able to complete its dive bombing tests by early December 1937. But there were other difficulties also. The Overstrands proved an unsuitable type for the "run-up" tests and at the end of September had to be replaced by a flight of Heyfords from No. 166 Sqdn. Also it proved impossible to complete certain specified serial trials and they had to be modified, discontinued or transferred to Phase II.(2) Moreover, although the squadrons were screened from the point of view of postings, it proved impossible to retain the trained crews intact owing to selections from them for training as air pilots and every time this occurred another crew had to be trained.

Meanwhile the sea exercises against the Centurion took place between 26 August and 10 September 1937. Owing to the necessity for periodic maintenance and examination of the ship between bombing days and to some days of impossible weather, there were only five separate days on which trials were carried out. These were August 26th, 31st, September 2nd, 7th and 9th. A good start was made as the Centurion left Plymouth on 26 August on passage to Portsmouth and she was bombed successfully in high level attacks between Start Point and Portland Bill, the aircraft using Woodsford aerodrome some 70 miles distant. In the very hazy conditions it was found that, although the target ship could be clearly seen from 10,000 feet, the aircraft themselves were invisible to the marking ships below. Thereafter the Centurion worked from Portsmouth in a target area between Selsey Bill and Beachy Head, and the bombers operated from Tangmere aerodrome about 45 miles away. The plain unanalysed results were:-

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- (1) The vagueness of "a later date" was due to the fact that the automatic bombsight could not be made available in 1937 and to the scarcity of the modern Blenheim aircraft in service at that time.
  - (2) These included serial trials on the effect of speed on level bombing, the effect of wind velocity above 25 m.p.h., and the effect of bumpy air conditions on dive bombing. Ref. A.M. S.40054 encls. 138A and 139A.

ibid  
encl. 133A

A.H.B.  
IIA/1/4  
encl. 63

Squadron	Nature	Dropped	Hits	Percentage
No. 40 (Hinds)	Level bombing 10,000 feet	58	4	7
No. 101 (Overstrands)	Run-up tests 10,000 feet	19	nil	-
No. 15 (Hinds)	Dive bombing release at 2,000 feet Average dive 46°	75	17	22.6

ibid

On none of the five days were weather conditions favourable for both high level bombing and for accuracy in the marking of results, consequently the scientific data produced was not very satisfactory. As these weather conditions were in no way abnormal for this season along the south coast of England it was suggested that there was no future for the Centurion type of trials. Taken in conjunction with similar weather frustration at the land bombing ranges it ought to have sounded a note of warning to the Air Staff as to the unsuitability of high level bombing being used against ship targets anywhere in N.W. European waters.

When the Phase I bombing trials were completed in mid-April 1938, the work of scientific analysis was undertaken. In order to speed this up, Air Vice-Marshal Douglas (now Assistant Chief of the Air Staff) gave instructions that it should be prepared in four sections. This was done and the results together with the scientific data were forwarded to the A.B.E. sub-committee on the following dates:-

A.M.  
S.41137  
encl. 51

- Section I - Dive Bombing - 27 April 1938
- Section II - Level bombing - 5 May 1938
- Section III - Run-up Tests - 7 June 1938
- Section IV - General Conclusions - 29 July 1938.

The A.B.E. sub-committee considered sections I, II and III from 22 June onwards and made section IV the basis for its conclusions on the 1937/38 Bombing Trials in its Third Interim Report (1) which was issued on 30 January 1939.

- (ix) The Report of the A.B.E. sub-committee on Bombing and A/A Defence - Ref. C.I.D. 1518-B

This important document summarised the results of Phase I of the trials including the Centurion exercises, and gave the considered views of the scientific sub-committee on long disputed questions in the Bomb versus Battleship controversy. It is important partly because it was the last impartial report on the vulnerability of capital ships before the outbreak of war, partly because it exercised a considerable influence on policy regarding the protection of merchant shipping, and partly because it favoured the employment of

- (1) The Sub-Committee's First Interim Report (C.I.D.1358-B of 18 Oct. 1937) merely recorded the form and data required from the agreed bombing and gunnery trials. The Second Interim Report (C.I.D.1406-B of 21 Feb. 1938) dealt almost exclusively with the problem of land A/A defence.

the torpedo against the battleship in preference to high level bombing.

The report began by emphasising the incompleteness of the trials, and the limitations of its enquiries, both as regards attack and defence, by the aircraft flying at a speed of only 120 m.p h.

The effects of variable factors on level and dive bombing

As regards level bombing accuracy, the average error increased with the height of bomb release. The recorded results were:-

<u>Height of release in feet</u>	-	5,000	10,000	15,000	20,000
<u>Average error in yards</u>	-	80	133	172	217

The optimum run-up time was about 80 seconds and if this time was reduced to 40 seconds the bombing error increased by 10%. By far the greatest source of error was attributed to the measurement of wind speed and direction. The average ground errors due solely to errors in wind estimation were about 70 yards from 10,000 feet i.e. 50% of the total error at this height. Regarding dive bombing, accuracy was found to decline with the increase in the height of release for both shallow and steep angles of dive. The error at 3,000 feet was roughly double that at a height of 1,000 feet.

On neither type of bombing was it considered that fatigue due to long distance approach had any effect while the effect of avoiding action on the part of the Centurion was negligible. The effect of bumpy weather conditions in dive bombing the Centurion was found to have been over-estimated by the Naval staff. The actual bare results of the Centurion exercises have already been given and these were born out by the conclusion of similar but more detailed trials on the Abingdon and Otmoor bombing ranges. It was significant in both that the average weather conditions around these islands were adverse to high level bombing which was the only method giving hope of penetration of a battleship's deck armour.

The Accuracy and Effectiveness of Naval A/A fire

In general the Report did not substantiate the claims made by the Admiralty.(1) Attention was drawn to the fact that naval anti-aircraft long range gunnery produced at best only one third the line accuracy obtained by land service methods. This was due to the necessity of estimating the course and speed of the aircraft by eye and could only be remedied by the introduction of a full tachymetric predictor. This was not expected to be in supply until 1942 though a partial system might be available in 1940.

In the case of short range weapons, the sub-committee stated that the chances of a vital hit by the eight barrel

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(1) The naval claim was that there would be approximately a 10% chance for each 4.5" gun in two minutes against a single aircraft level-bombing from 10,000 feet whereas the sub-committee estimated that there would be only a 10% chance of obtaining a casualty from one control group of four guns even if the run-up time was 90 seconds.

Pom-Pom on a diving aeroplane might be assessed at an average of one in four attacks and by a four barrel Pom-Pom at one in ten attacks.(1) They considered that such weapons would only be satisfactory with an adequate fire control system but they pointed out that if the more efficient Kerrison predictor-cum-power control system was successfully adapted to naval conditions the eight barrel Pom-Pom would use far too much ammunition for the task in view.

As a result of a purely mathematical analysis of the efficacy of A/A fire as a protection of ships against air attack the sub-committee gave its opinion that as far as marksmanship was concerned, honours appeared to be more or less even with a slight advantage in favour of aircraft. But the test of value really lay in the comparable damage done by the hits on each side - this was, of course, largely in favour of aircraft. However, the sub-committee considered that the most favourable bombing targets for aircraft were not the heavily protected battleships but the more lightly armoured aircraft carriers, cruisers and destroyers even though in most cases they presented smaller targets.

#### Conclusions

After drawing attention once again to the limitations of the available evidence, the sub-committee stated that the broad results to date were that two hits on every aircraft carrier and one on every cruiser might be expected for every aircraft hit, and that destroyers were virtually defenceless from air attack. The advent of the faster aeroplane was likely to synchronise with an altered bombing technique which would certainly reduce the length of time required for straight run-up and therefore the length of time the aircraft was under controlled fire. Thus even if psychological factors altered after the first few engagements of war in favour of the defence and a reduced chance of a hit by aircraft, it was unlikely to be reduced to the same extent as the chance of a hit by the gun. Moreover, aircraft were becoming increasingly less vulnerable to shell fire.

Two other important conclusions were stated. The first of these was the "the problem of the protection of merchant shipping from air attack is at present unsolved. Improvised methods of arming merchant ships with obsolete 12 pounder guns converted into high angle armament are absolutely valueless". The second was that "the torpedo is by far the most formidable of all existing forms of aircraft attack on a fleet".(2)

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- (1) The Admiralty claimed that 30% aircraft casualties could be obtained by each Pom-Pom.
  - (2) The grounds for the sub-committee's view were:-
    - (i) In peace time practices, accuracy with the torpedo dropped from aircraft was very much greater than with the bomb.
    - (ii) The time on straight run-up for a torpedo attack was only three to ten seconds as compared with 80 seconds for level bombing.
    - (iii) A hit by a torpedo below the waterline would put a battleship in dock whereas a bomb hit might only do superficial damage to a well armoured ship.

"These conclusions, based on a broad survey of the whole problem, compelled the sub-committee to express and emphasize its view that policy as regards air attack on and A/A defence of a fleet and of merchant shipping should be reviewed in all aspects - strategical, tactical and supply - without delay".

(x) War breaks out before completion of the further trials in 1939

It can be seen that in two respects the conclusions of the A.B.E. sub-committee were contrary to the opinions held by the Naval and Air Staffs. Firstly, the efficacy of naval A/A gunnery had been called in question and secondly, although the previously claimed accuracies for bombing were on the whole well founded, the use of high level bombing against the capital ship was turned down in favour of the airborne torpedo. Air Vice-Marshal Sholto Douglas's comment was that this latter conclusion might well be correct and that the Fleet Air Arm were right to regard the torpedo as their primary weapon. However, he doubted if it was worth while equipping even a proportion of the Metropolitan Force bombers as torpedo bombers owing to the complications involved in aircraft design and the difficulties of special training.

A.M.  
S.59866  
encl. 2A

Lord Chatfield, who was now the Minister for Co-ordination of Defence, was so impressed by the controversial conclusions of the sub-committee that he felt it necessary to hold a preliminary meeting of the Defence Ministers before the Report was referred to the Committee of Imperial Defence. This was held on 8 February 1939 and, although discussion centred mainly on the question of protection of merchant shipping, the general opinion was that the other conclusions in the Third Interim Report could not be accepted unreservedly as they stood. Thus, once again, judgement on the main issue of the vulnerability of capital ships to air attack was suspended pending the accumulation of still more evidence in fresh trials during 1939.

C.I.D.  
1528-B

A.M.  
S.49866  
encl. 3A

Meanwhile, as a result of the experience gained in Phase I trials, the Air Staff had become convinced that the holding of special bombing trials was an uneconomical way of providing the A.B.E. sub-committee with the necessary scientific data. In the Spring of 1938, Analysis Sections had been established at certain of the Armament Training Stations which opened up the prospect of obtaining this data without the organisation of special trials. In July the C.A.S. sanctioned this alternative procedure and on 16 December the A.B.E. sub-committee agreed to make use of the consolidated reports of the Analysis Sections. This obviated the need for holding Phase II of the special bombing trials.

A.M.  
S.41137  
encls.  
51, 67 and 77

On 18 January 1939 a conference was held at the Air Ministry to discuss the new procedure in relation to the 1939 experiments. From the discussions it emerged that the compilation of the further data required by the sub-committee could not be made available before the end of 1939. Provisional schedules of the 1939 trials were agreed and later approved by the A.B.E. sub-committee. It was also decided that No. 25 (Armament) Group should analyse the 1939 Armament Training Camp results to show:-

ibid  
encl. 85

- (a) the effect of air speed at release on the accuracy of level bombing.

- (b) the accuracy of low level bombing with modern aircraft.
- (c) the accuracy of dive bombing with modern aircraft.

A.M.  
S.49451  
encls. 179A  
and 175A

During the first eight months of 1939 the A.B.E. sub-committee continued to take evidence and collect data from the Admiralty and the Air Ministry but the only substantial reports which were laid before it were the 1938 Armament Training Camp results made available on 28 August and a summary of Fleet Air Arm Torpedo Aircraft attacks in 1937/38 which was sent by the Admiralty on 26 July. Before any conclusions were arrived at on these by the sub-committee, the Second World War had broken out.

(xi) Summary of the long controversy

Eighteen years of experiments had not fully elucidated the problem of the vulnerability of capital ships to air attack. During these years some opinions had been modified several times, others had been abandoned and finally some conclusions of general application had been formulated. For instance, the views of the extreme "anti-battleship" school had been discredited, the Admiralty had successfully defended the capital ship as indispensable for strategic reasons but the expectations of the Naval Staff as to the effectiveness of naval A/A gunnery had been shown to be unduly optimistic as also were the Air Staff's claims for high level bombing. While the Navy had never attempted to prove that battleships could not be hit, the Air Staff ultimately was prepared to admit that in this respect they were less vulnerable than any other naval unit but they should have realised that in N.W. European waters the average weather conditions discounted success from high level bombing and with it the chance of disabling a battleship. On the other hand the Air Staff had given the Government unambiguous warning that the sphere of battle fleets would, in the future, be restricted to areas outside the range of powerful shore based air forces and in that they were to be fully confirmed by events. Finally, in 1939 impartial scientific opinion had pronounced the torpedo to be the most dangerous of all existing forms of aircraft attack on capital ships.

It is difficult now so long afterwards to realise the tenacity of the universal view held in the inter-war years that action between rival battle fleets was still going to be the normal course of a sea war. The attack potential of the ever growing Air Power thus revolved ceaselessly around the single objective - the battleship. Could it be hit and if so would it be disabled or could it beat off air attack? There was little room for thought to be given to long range air search for hostile warships and the far more difficult task of getting an air strike out to attack what was found, even less to the development of a technique for the location and attack on hostile submarines.

Basically, the battleship problem was one which no peacetime experiment under unavoidable laboratory conditions could hope to resolve. It was one of those difficult questions arising in the inter-war period upon which the experience of the last war could throw no light and which were only capable of solution by a further major conflict. In the event the number of capital ships sunk or disabled by any kind of bombing at sea was small but the threat of such attack remained a potent restriction on their disposition and movements.

CHAPTER X

THE TRANSFER OF THE FLEET AIR ARM - 1937

(i) Renewed Admiralty demand for the Fleet Air Arm

After Sir Thomas Inskip's findings in his enquiry into the manning of the Fleet Air Arm (the First Inskip Enquiry) he gave it as his opinion that some form of further enquiry would be required in view of the active dissatisfaction in naval circles with the whole constitutional position of the Fleet Air Arm; furthermore, the tenor of his findings showed a bias in favour of their ultimate breakaway. In any event, within a fortnight of the issue of his report the First Sea Lord launched a full scale attack which was enthusiastically backed by the recently appointed First Lord of the Admiralty, Sir Samuel Hoare. (1) This attack, by Admiral Sir Ernle Chatfield, was in the form of a long letter addressed to the First Lord in which were recapitulated all the reasons why the Admiralty and Navy at large were convinced that the time had come to recognise that the system had outgrown whatever value it might have had in 1923 and that it was essential it should be terminated as soon as possible. He concluded by urging the First Lord to make the Prime Minister aware of the fact that the Navy's efficiency was being seriously and increasingly impaired which, in his considered judgement, necessitated a complete and immediate change in the organisation, administration and control of the Navy's air services. (2)

See  
Chapter VII  
(v)

A.H.B./ID/3/5  
Letter dated  
16 Nov. 1936

This letter was sent by the First Lord to the Prime Minister (Mr. Stanley Baldwin) and Sir Thomas Inskip on 19 November and to Lord Swinton (Secretary of State for Air) on 9 December. It was followed on 21 December by a communication from the First Lord to Lord Swinton in which he referred to that clause in the First Inskip Report whereby the Air Ministry offered, as an experiment, to train 12 to 15 naval ratings as pilots. At this stage, the First Lord said, it was far too late to regard this as an experiment and he asked for 34 naval ratings to be taken at the earliest possible date and appended a list of special conditions under which they should be trained and employed in the Fleet Air Arm. Coming almost on top of the First Sea Lord's aggressive letter, this abrupt request from Sir Samuel Hoare seems a little lacking in finesse but Lord Swinton replied with dignity that, having given their word to abide by the Inskip Report, the Air Ministry were prepared to accept this extra request.

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Throughout the three winter months Parliament and the Press was flooded with speeches, articles and letters

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- (1) It was, some may think, curious that as Secretary for State for Air for over six years between 1922 and 1929 and champion in the retention of the F.A.A. within the R.A.F., Sir Samuel Hoare after only six months at the Admiralty should become so zealous in rebellion. Perhaps his inside knowledge of Air Ministry resistance tactics was useful to the Board of Admirals.
  - (2) This amounted to a claim to form a separate Royal Naval Air Service.

screaming for the removal of the Fleet Air Arm from the administrative control of the Air Ministry. The national newspapers produced leaders on the subject which again added to the stream of almost hysterical and wild accusation and counter-accusation. Serving officers joined in this 'free for all' by using M.P.s or other public figures to propagate the extreme views held by either side in the controversy. The two chief protagonists, Lord Trenchard and Sir Roger Keyes thundered almost daily either in Parliament or in the Press so releasing still more impassioned letters from their respective supporters who now included the shore-based maritime aircraft in the argument.

(ii) An Enquiry appointed into both the F.A.A. and shore-based maritime aircraft question

From the extent and volume of feeling so expressed it was apparent that Governmental notice must be taken and Sir Samuel Hoare had little difficulty in persuading the Prime Minister that, however much trouble might be involved, some kind of enquiry was politically necessary. On 16 February 1937 Mr. Baldwin wrote to Lord Swinton to this effect and added that a similar issue on the question of shorebased aircraft for the defence of shipping was certain to arise and might as well be faced now as later. He proposed to appoint an enquiry into the relations of the Navy and Air Force with regard to the control of and responsibility for the Fleet Air Arm and naval air operations generally. He suggested that Sir Thomas Inskip, Lord Halifax (Lord Privy Seal) and Mr. Oliver Stanley (President of the Board of Trade) seemed a suitable body to conduct the enquiry and he invited Lord Swinton to say whether he was in agreement with these proposals.

Lord Swinton replied next day in surprise and concern. He pointed out the Prime Minister's consistent refusal on the many former occasions to have this issue discussed or latterly even mentioned. The recent Inskip Enquiry had been conducted on this very understanding. Its findings, although rejecting one of the main contentions of the Air Staff, had been willingly accepted by the Air Ministry for the common good. This considered report was now apparently to be discarded. The Air Ministry and the Service would of course submit to any enquiry which the Prime Minister directed but it was his duty to point out that the wide scope must for some time absorb the attention of the Air Council and Staff who were already seriously overworked by the Expansion schemes, and would dissipate energies which ought to be concentrated on our defence problems.

For the next ten days the terms of reference for the enquiry and the method of procedure were discussed between the two Departments and the Minister for the Co-ordination of Defence. On 25 February it was agreed between Sir Thomas Inskip and Lord Swinton that the enquiry should be conducted in two stages. In the first, it should relate to the general strategical and operational background of the Fleet Air Arm question and in the second, the detailed problems of administration should be considered in the light of the general conclusions already arrived at by the first. Unfortunately, as will appear later, Sir Thomas Inskip did not interpret this method of procedure in the same way as

A.H.B.  
ID2/106

A.H.B.  
ID/3/5

ibid

ibid  
Letters dated  
26 Feb. and  
1 March

either Lord Swinton or the C.A.S. (Sir Edward Ellington).<sup>(1)</sup> Early in March, as the result of further consultation between Sir Thomas Inskip and the Prime Minister, it was finally decided that the enquiry should not be carried out by a ministerial sub-committee but by Sir Thomas Inskip in association with the Chiefs of Staff. This joint enquiry was to concern itself with:-

- (a) 'The functions of the Fleet Air Arm, particularly in relation to Naval operations and the efficiency of the Navy.
- (b) The functions of other air units (including G.R. and flying boat squadrons) which are required to take part in either naval operations or air operations over the sea.
- (c) The most effective operational use of the aircraft and the best administrative arrangements for the provision, training and control of personnel, for the supply and equipment, and for the provision of reserves for such air forces.'

(iii) The Second Inskip Enquiry - Stage I

The enquiry opened on 9 April 1937 with a series of meetings<sup>(2)</sup> held by Sir Thomas Inskip at which the Chiefs of Staff discussed the control of naval air work in relation to the general problem of national defence. From the discussions it emerged that:-

- (i) An early decision on the transfer of the administrative control of the Fleet Air Arm was regarded by the Naval staff as vital.
- (ii) That no system of joint responsibility for air/sea operations, at least in the tactical sphere, would be acceptable.
- (iii) That the primary requirement of the Admiralty as regards the shorebased aircraft of Coastal Command was not so much for complete transfer as for their permanent allocation to the task of naval co-operation.

202nd, 205th  
and 206th Chief  
of Staff  
Meetings

The importance of these meetings was that they gave Sir Thomas Inskip a clear indication that the Admiralty would not be satisfied with anything less than the complete and early transfer of the Fleet Air Arm from Air Ministry control but that it might be induced to surrender its demand for the revival of a Royal Naval Air Service.

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- (1) This procedure had seemingly been recommended by the C.A.S. on the calculation that if the conclusions on Stage I were adverse to the naval contentions on the broad strategical problem of air defence, there would be no valid reason for proceeding to Stage II of the enquiry.
  - (2) These were held on 9 April, and 6 and 18 May.

The Air Ministry's Case

Meanwhile both the Air Ministry and the Admiralty had submitted memoranda on various aspects of the Fleet Air Arm problem. The main Air Ministry memorandum was circulated as C.O.S. 572 on 20 April. In accordance with the agreed procedure it confined its attention to the broad strategical aspects of inter-service co-operation and expounded what may be called the classical doctrine for the centralised control of air forces. It began by analysing the problems of defence raised by the advent of air power and the unprecedented dangers to which Great Britain was exposed in war under the threat of air attack. The problem of inter-service relations was complicated, firstly by the difficulty of demarcating the respective spheres of responsibility and, secondly by divergence of views as to the proportion of our total air resources which should be controlled in an ancillary capacity by the Navy and the Army. These problems could not be solved by the parochial pursuit by each of the Services of the ideal of self-sufficiency. The fundamental problem was one of organisation and how to achieve the most efficient use of the fighting resources of the country as a whole. It was contended that the solution would be found by recognising the interdependence of the three Services and by striving for the maximum degree of co-operation between them. The Admiralty's demand for the full control of both the Fleet Air Arm and of the shorebased naval cooperation units of Coastal Command would not only involve the disintegration of the unified air force but would logically lead to a demand for a shorebased naval air striking force for the attack of enemy naval bases.

The memorandum concluded by saying that the fulfilment of the Air Force's vital responsibility for the air defence of Great Britain could only be properly ensured if the number of aircraft specialised by type and allocated to ancillary tasks could be restricted to the narrowest limits consistent with the needs of co-operation. This was the accepted policy of the Air Staff and could be justified:-

- (a) By the country's limited productive capacity which precluded acquiescence in the competing Service demands for air resources based on the ideal of self-sufficiency.
- (b) By the need for co-ordinating the complex air defence requirements of the country as a whole in order that sectional interests should not be able to insist on the use of aircraft for their protection.
- (c) By the necessity of maintaining an adequate air striking force to offset, so far as possible, the high vulnerability of Great Britain to foreign air attack.

Such a policy could only be implemented by the acceptance of the principle of centralised direction. In the Air Ministry's view the defence problem was, therefore, indivisible and, though the particularity of function of the Services could be accepted, the essential cornerstone of defence would have to be co-operation.

C.O.S.+572  
in A.H.B./  
ID/3/5

ibid

The Admiralty's Case

The Admiralty memorandum was dated 16 April but was not circulated as C.O.S. 571 until 20 April. It dealt mainly with the administrative aspects of the dispute. The case for the transfer of full control over the Fleet Air Arm was based on three main arguments. These were:-

- (i) The great and recent development in the specialisation of naval air work which demanded a personnel wholly naval in composition.
- (ii) The paramount necessity of allaying the discontent of naval members of the Fleet Air Arm with their unsatisfactory status vis-a-vis R.A.F. personnel.
- (iii) The need to end, without delay, Admiralty dissatisfaction with R.A.F. administrative control.

C.O.S. 571  
in A.H.B./  
ID/3/5

Regarding (i), the memorandum stressed the improvement which had occurred in the postwar period in the arrangements for carrying aircraft in and operating them from both carriers and catapult ships, the specialisation of the aircraft themselves and of their equipment for the conditions of naval work. Such work, which was essentially naval in character, included reconnaissance, spotting and target observation, close tactical co-operation with naval units, anti-submarine work, day and night shadowing, convoy work, and direct attack on enemy ships. Although the Admiralty already had operational control of aircraft fulfilling these functions whilst they were embarked, in the Admiralty conception this control carried with it the right to organise, train and equip them. Moreover, naval air operations differed radically from air operations carried out overland.<sup>(1)</sup> This was particularly true of air attack in which special navigational skill was required to find targets at sea and special knowledge was required to identify ships in difficult weather conditions. Air search and patrol over the sea were based on scientific naval technique and the tactics employed in fleet observation work were almost entirely specialised. Under these conditions personnel engaged on such duties could not be efficient unless they had close continuous acquaintance with almost every aspect of naval warfare. This could not possibly be gained in the comparatively short periods which R.A.F. pilots spent with the Fleet. It followed that the pilot personnel should be drawn exclusively from naval sources.

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Regarding (ii), the recommendation of the Balfour Report and the Trenchard/Keyes Agreements had been inspired by the laudable intention that each of the two Services should attain a deeper knowledge of and respect for the traditions, technique and outlook of the other and had provided for this by the system of 'attaching' naval officers to the Fleet Air Arm. That system, however, had given rise to many difficulties and had caused much heart-burning among the naval personnel who volunteered for service in this branch of the R.A.F. For instance, the position of the F.A.A.

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(1) The Air Staff contention that there was no difference seems, in the light of later experience, thoroughly misguided.

Observers, who were all naval officers and held no R.A.F. rank, was anomalous. In the air, command of the aircraft was vested entirely in the pilot with the result that the observer, who was often more capable of making a correct tactical decision, was left without any executive responsibility. Other anomalies existed such as the possibility that a naval pilot could be senior to another naval pilot in naval rank but junior in Air Force rank. The dual rank system also resulted in the loss of the services of a considerable proportion of fully trained naval pilots because all naval officers who could not be included in the quota due for promotion in R.A.F. rank were reverted, after a certain time, to general naval service.

Again, the overwhelming majority of the higher administrative posts concerned with the embarked units were held by R.A.F. personnel, despite the fact that 85 per cent of the pilot and observer posts in the shipborne units were held by naval officers. It was symptomatic that in the establishment of the headquarters staff of Coastal Command there was, at this time, provision for only one post for a naval officer. The system of providing the maintenance personnel solely from the Air Force also led to ill-feeling, since it meant that on board nearly every large ship in the Navy, as well as in the carriers, a detachment of the R.A.F. was established. In the carriers these detachments amounted to several hundreds of men and included thirty or more R.A.F. officers. In the Admiralty view these grievances could not be remedied except by the abolition of the dual system from which they were inseparable.

Regarding (iii), the Air Ministry policy for reserves had obliged the Admiralty to adopt unsatisfactory compromises which had unfortunate administrative repercussions. The Air Ministry practice of training large numbers of short-service pilots for the Fleet Air Arm in order to build up the reserves not only lowered the efficiency of the first-line pilot personnel but caused an unnecessary waste of time in providing R.A.F. volunteers with elementary naval experience. In the field of supply and design of aircraft the Admiralty expectations had been disappointed. Although the views of naval officers were generally sympathetically heard, it was very difficult for the Admiralty to exert any decisive influence on the design or provision of new types. Two specific grievances were that the Air Ministry was dilatory in the provision of new service types of aircraft for the Fleet Air Arm, and that insufficient regard was paid to the special equipment requirements called for in naval air work.

Finally, the R.A.F. administrative control was held accountable for difficulties in the training of F.A.A. pilots. Owing to the lack of a sufficiently permanent association with the Navy, R.A.F. personnel engaged in naval air work were not enabled to acquire the knowledge and experience necessary for full efficiency in the Fleet Air Arm. The requisite specialised standards and technique of close naval co-operation were also deficient among the shorebased units of Coastal Command, mainly owing to the Air Staff policy of not regarding these aircraft as primarily for naval co-operation. Above all, Admiralty dissatisfaction was manifested over the inability of the captains of carriers and catapult ships to exercise definite control over

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the manner in which the shore-training of Fleet Air Arm units was carried out. Although naval commanders could indicate their training requirements to the Air Force officers in command of shore stations, there was always the possibility that these might not be carried out owing to other factors such as, the necessity for overhauls and repairs. A position where those responsible for the fighting efficiency of the aircraft under their operational control could not guarantee adequate shore-training was intolerable. The only solution would be to give the Admiralty full control over the shore-training stations - in other words to transfer administrative control of the Fleet Air Arm to the Admiralty.

In conclusion, the memorandum condemned the dual system because it did not allow proper steps to be taken by the Admiralty for carrying out the Navy's responsibilities, because it would not prove adequate to the task of handling the planned expansion of the Fleet Air Arm(1) but, above all, because of the settled conviction throughout the fleet that the system which had proved so unsatisfactory in peace must fail in war with the most serious consequences.

On 6 May Sir Thomas Inskip invited both the First Sea Lord and the C.A.S. to make any comments they wished on the various memoranda which had so far been submitted by either side.(2) On the following day Sir Edward Ellington replied that he did not, at the moment, propose to comment on the main Admiralty memorandum (C.O.S. 571) since it did not concern itself with the wider aspects of the issue then under consideration. If, at a later stage, it was decided to carry out an investigation into the conditions of the Fleet Air Arm itself, he would wish to have an opportunity of dealing with the many highly controversial statements made in the Admiralty paper. This attitude was fully consonant with the agreed procedure and was probably meant to reaffirm the Air Staff's intention to adhere to that procedure.

A.H.B.  
ID/3/5

(iv) A change of Procedure

During the latter part of May and the first half of June Sir Thomas Inskip seems to have altered his ideas on the question of procedure. As he subsequently revealed, he was at this point anxious to ensure that he should not be debarred from making an early and a real decision on the whole Fleet Air Arm dispute. He was also anxious not to be forced into a position where he would have to give a purely academic verdict. If he adhered to the procedure arranged with the Air Ministry that particular danger could not be avoided as he realised by this time that on the purely strategical or operational issue there was virtually nothing for him to

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- (1) In April 1937 the strength of the F.A.A. was 182 aircraft, consisting of 144 aircraft in 13 carrierborne squadrons and 38 catapult aircraft. Under the current Expansion Scheme F, this strength was to attain 312 aircraft by April 1939 and 504 by 1942.
  - (2) Besides their main Memorandum, the Air Ministry had submitted others on a historical survey of the various disputes between the two Departments from 1917 to 1936, a paper on the 'Co-ordination and Control of Defence Operations' - 1937, a memorandum on 'Air Defence and Divided Control', and a paper on Flying Boats. All are contained in A.H.B./ID/3/5.

decide since operationally the Fleet Air Arm was already controlled by the Admiralty. Just to have stated that position would be futile and would have satisfied neither the Admiralty nor those members of Parliament who expected not merely an academic discussion but a decision. There seemed no way of achieving that result except by considering the administrative or Stage II of the problem before giving any conclusion on Stage I. He was fully conscious that he would be accused of having gone contrary to the original terms of reference but he felt compelled to accept that risk.

These appear to have been the motives which prompted him on 23 June to suggest a change of procedure. Writing to the C.A.S. he suggested that, early in July, evidence of fact and personal experience should be taken by a small Ministerial Committee consisting of himself, Lord Halifax and Mr. Oliver Stanley. The purpose of these meetings would be to consider how far the defects in the Fleet Air Arm alleged in the Admiralty memorandum could be borne out in fact. This attempt to shift the ground of the enquiry produced a protest from Lord Swinton who saw Sir Thomas Inskip on the following day and discussed the suggested change in the presence of Sir Maurice Hankey. Exactly what occurred at this meeting on 24 June is not clear from the available correspondence but despite Lord Swinton's assertion to the contrary there does appear to have been a misunderstanding. According to his own account, Lord Swinton reminded Sir Thomas of the scope of the enquiry as originally agreed and asked whether it was his intention to change it so as to allow him to go into detailed questions of organisation before deciding the main strategic principles. Sir Thomas replied that he did not intend to depart from the general line laid down. But in the interchange of opinion which followed it is clear from what occurred later that Sir Thomas, while fully prepared to abandon his suggestion of holding a series of ministerial meetings, did not intend to conform with the procedure previously agreed with Lord Swinton and the C.A.S. He agreed to continue the enquiry on his own without the assistance of colleagues and told Lord Swinton that he proposed to complete his report and submit it to the Prime Minister and with his approval present it to the Cabinet. He then asked Lord Swinton what he thought would be the next stage. Lord Swinton, fully under the impression that this report referred to the first stage, said that this was clearly provided for - assuming the Cabinet supported his recommendations, he would then proceed either by himself or with the assistance of colleagues to take up with the two Services points of difficulty in administration and organisation and to solve those in the light of the previous Cabinet ruling. Sir Thomas then told Lord Swinton to regard his letter of 23 June to the C.A.S. as not written. Lord Swinton took this to mean that the agreed procedure would be followed and the administrative issue would not be reported on till after the next stage. He immediately passed this view to the C.A.S. But again it is clear from what occurred later that in his request to Lord Swinton to disregard his letter Sir Thomas only intended to confirm that he would not hold the series of ministerial meetings.

Thus the position was created whereby Lord Swinton and the C.A.S. continued to believe that Inskip's first report would be on the main strategic principles of the Defence Forces, to be followed by Stage II of the investigation into the administrative question of the Fleet Air Arm, whereas in fact Sir Thomas

ibid

A.H.B./  
ID/3/5  
Letter dated  
25 June 1937

ibid

ibid

regarded the question of administrative control as a principle on which he was preparing to decide on the oral and written material already before him. He must have been aware that Lord Swinton was under a misapprehension and it is difficult not to conclude that it was purposefully allowed to remain.

(v) No Stage II but a final decision given on the whole subject

Just under a month later, on 21 July 1937, Sir Thomas Inskip made his report to the Prime Minister (now Mr. Neville Chamberlain), and his conclusions were:-

1. That the Admiralty should have not only the operational but the administrative control of the Fleet Air Arm.
2. That the Admiralty claim for the operational control of the shore-based aircraft of Coastal Command should be rejected.

A.H.B.  
ID/3/5

In a covering letter to Mr. Chamberlain, Sir Thomas outlined the reasons why he now gave his verdict on the whole subject and not on the main strategic question first. He said he had done his best to consider only the strategic position but, as pointed out in his Report, so far as the Fleet Air Arm was concerned there was no question at issue regarding its operational control or its permanent allocation to and identification with the Fleet. Having taken note of this, he came to the conclusion that the Admiralty should have not only the operational but the administrative control. However, when he came to shorebased aircraft he was dealing with air units which the Admiralty, contrary to the views of the Air Ministry, asked should be permanently allocated to the Admiralty. This difference of opinion, involving the question of operational control, raised the strategic question of the best use of our available air forces. He had discussed this question in his Report and had come to the conclusion therein stated that the Admiralty demand should not be granted. He also considered that his recommendations would facilitate the completion of the schemes now in progress in the Joint Staff Planning Committee for the protection of Seaborne trade.

ibid

The actual grounds upon which his recommendations were based were specified in the Report itself. It was evident, in the first place, that the suggested transfer of full control over the Fleet Air Arm had not been made because of its inefficiency whilst under R.A.F. administration. The Report referred to the shipborne units as a 'force of remarkable keenness and efficiency' but 'disagreement had persisted and today the Admiralty and the Air Ministry have still to be described as the contending parties'. So far as general principles were concerned the Report expressed sympathy with the Admiralty case for the specialisation of naval air work and also with the Air Ministry's plea for centralised control. But he pointed out that on the one hand the naval argument for specialisation seemed to apply only to the shipborne aircraft of the Fleet Air Arm and on the other that the Air Staff doctrine of unification could not be rigidly maintained. While, therefore, admitting that the Air Ministry view seemed to him very convincing, he felt

ibid

it necessary to decide how far the exceptions to the general principle of centralisation should go. In answering this question it was necessary to consider separately first the Fleet Air Arm and secondly the shorebased aircraft.

The Report justified the suggested transfer of the Fleet Air Arm:-

- (a) Because that service was an integral part of the Fleet.(1)
- (b) Because it considered that the shipborne aircraft would be likely to be more efficient if the Admiralty were made responsible for their administration.
- (c) Because the conditions, upon which the Balfour Settlement of 1923 had been founded, had changed.

ibid

The actual details of transfer would require to be worked out between the two Departments, since no specific plans had yet been put forward by the Admiralty. This would call for the closest co-operation between the Admiralty and Air Ministry as would, also, the need for meeting the reasonable naval request for a more decisive voice in settling the type of machine suitable for the Fleet Air Arm.

ibid

The Report justified the rejection of the Admiralty claim to control the shorebased aircraft of Coastal Command on the ground that the limitation of our total resources made it unjustifiable to lock up aircraft in order to keep every area simultaneously under continuous observation or that all the convoys could be continuously protected. Even the more limited plea that the shorebased units should be permanently allocated for naval co-operation duties was also disallowed because the needs of the air defences of Great Britain required a continuous adjustment in the proportion of air forces allotted for trade defence. Admiralty complaints about the poor standard of specialised training which was given to units of Coastal Command could be remedied by a much closer liaison between the Admiralty and the Air Ministry.

ibid

The Report concluded 'The matters submitted to me are, as is so often found to be the case in an acute controversy, questions of degree and proportion rather than questions that can be answered in absolute terms. Partisans outside the Services often speak as if there was a simple yes or no to the demand of the Navy and of the Air Force. That is not possible in my judgement. I regard the Air Ministry as the central authority responsible for developing Air Power. They must conduct experiment and research. The science and the art of flying must grow under the fostering care of the Air Ministry. If my view as to the Fleet Air Arm is approved difficult problems are likely to arise in giving effect to it. Goodwill and a determination to make the plan succeed are essential; if these conditions exist success is certain.

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- (1) "The air unit in a carrier or in a capital ship is a great deal more than a passenger in a convenient vehicle. It forms part of the organisation of the ship, and as such is a factor in the efficiency of the ship, its whole raison d'etre being the employment of air power in naval operations." Extract from the Report.

(vi) Indignation in the Air Ministry but Inskip maintains his views

A.H.B.  
ID/3/5  
Letters dated  
22nd and 23rd  
July

The news of Sir Thomas Inskip's recommendations exploded in the Air Ministry with all the force and unexpectedness of a bombshell. Indignation at what was naturally regarded as a breach of the understanding between Sir Thomas and Lord Swinton, and consternation that a verdict had been given without allowing the Air Ministry to submit their detailed reply to the allegations in the Admiralty memorandum were the predominant feelings among the Air Staff. Some of this indignation was passed on by Lord Swinton in letters both to the Prime Minister and to Sir Thomas. All that could be done in a practical way, however, was to ensure that Sir Thomas should consider the Air Staff's counterblast to the Admiralty's C.O.S. 571 and should consent to be interviewed by the C.A.S. and other serving Air Force officers.

contained in  
ID/3/5

Sir Thomas Inskip had no alternative but to agree. He read the memorandum and saw the C.A.S., who was supported by Air Marshal Mitchell and Air Vice-Marshal Welsh in the presence of Sir Maurice Hankey. The interview took place on 26 July. Sir Thomas admitted that he had accepted the earlier procedure and when the C.A.S. protested that it had not been followed because a definite recommendation had been made without having fully examined the Air Ministry case, Sir Thomas replied that the C.A.S. was assuming the position of a litigant who complained to the judge that he had reached a decision on insufficient evidence. That was a matter for the judge. He then said that he had read the Air Ministry reply to the Admiralty paper, but those replies would only be material to the discussion if he had made his recommendation on the grounds that the existing system was inefficient. In fact he had decided on principle that the Fleet Air Arm should be entirely Naval on the grounds that it was inherently impossible to have a Fleet Air Arm without friction unless it was entirely Naval.

A.H.B.  
ID/3/5

There followed a long discussion on the various difficulties which would arise if this scheme was attempted and as to what would happen if subsequent investigation found that the proposed scheme was either impossible or worse than the existing one. When pressed for a reply Sir Thomas admitted that he presumed the Cabinet would then reverse the decision, whereupon the C.A.S. pointed out that it was obviously better that the decision should be withheld until a possible alternative had been examined. On Sir Maurice Hankey's intervention it was suggested that the Air Ministry's view could be stated firstly, that the decision must be one of principle only, and secondly, that it should be provisional pending investigation of a detailed scheme, as in their view the principle might prove impractical in detail. Sir Thomas agreed to report this view to the Prime Minister and expressed the conviction that if the Admiralty and the Air Ministry accepted the decision they could, with goodwill on both sides, work out a better scheme than the existing one; to which the C.A.S. replied that with goodwill on both sides the existing scheme would work.

ibid

This forensic treatment of the Air Staff representatives was again displayed in Sir Thomas Inskip's handling of the Air Ministry's memorandum. He stated his conclusions in a supplementary report dated 26 July. In it he agreed that the Admiralty had not yet formulated even in outline any concrete scheme for giving effect to their demand and that it was therefore impossible to examine the administrative aspects of their proposals. He envisaged the preparation of a scheme and its examination by the Air Ministry as being the next stage of this enquiry assuming that the Cabinet approved of his recommendation for the transfer of the Fleet Air Arm to the Admiralty. The memorandum proceeded to recapitulate the Air Ministry thesis already discussed in his main Report that the three Departments must co-operate on a basis of particularity of function. He had nothing to add to his main Report on this subject. However, the last paragraph of the introduction in the Air memorandum contained the following passage:-

'But the Air Ministry admit that under present conditions these arrangements do not operate to the fullest efficiency of which they are capable. The organisation of the Fleet Air Arm rests upon a partnership between the Navy and the Air Force and no partnership produces its best results if the constant aim of one of the partners is to oust the other from the business. The existence of this spirit at the Admiralty from the time of the issue of the Balfour Report onwards has undoubtedly been prejudicial to administrative co-operation in matters touching the Fleet Air Arm.'

He read this as confirming the impression he had formed that the existing system had not been conducive to the best results. It was no part of his duty to apportion the blame for these conditions but he was of opinion that the control of the Fleet Air Arm by the Admiralty would be a more natural order than the present system and as such likely to produce results which the Air Ministry state are not forthcoming.

The rest of the memorandum was dismissed as containing either a series of 'fair debating points which did not affect his judgement' or of repetitions of arguments which had already been advanced in previous Air Ministry memoranda.

(vii) Cabinet consideration and approval

Three days later, on 29 July, Sir Thomas Inskip's two Reports were considered by the Cabinet.(1) He opened proceedings by explaining the Reports. Discussion on the various points was taken up by the various Ministers present. The new First Lord of the Admiralty(2) said he had inherited this controversy and since assuming office he had been surprised to find the strength of feeling on this subject in the Admiralty and, indeed, among all naval officers to whom he had spoken. The Admiralty were satisfied, on the whole, with the view

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- (1) The main report on 21 July, together with Inskip's covering letter to the Prime Minister, was circulated as C.P.199(37) and the supplementary report of 26 July as C.P.199A(37). Both are in A.H.B. ID/3/5.
  - (2) Sir Samuel Hoare, who was now the Home Secretary, had been replaced as First Lord of the Admiralty in May 1937 by Sir Alfred Duff-Cooper.

A.H.B.  
ID/3/5

taken by the Minister for Co-ordination of Defence but the decision on shorebased aircraft was not what they had hoped for; they were, however, willing to accept it.

Lord Swinton put his case for the retention of the Fleet Air Arm by asking his colleagues:-

- (a) Was it sound or justifiable in principle to make an exception in the case of the Fleet Air Arm from the general thesis of the Air Ministry which had been accepted by Sir Thomas Inskip?
- (b) Was it advisable to cut off the Fleet Air Arm from the main stream of aviation development in research, design, technique and strategy?
- (c) Was it reasonable to agree to the principle of transfer when no one knew what the naval scheme would involve since it had not yet been produced?

ibid

Discussion centred round this last point. Sir Samuel Hoare asked the Cabinet to remember that Lord Balfour and Lord Salisbury had both admitted that the existing scheme was of an experimental character and that as the Air Force grew, it might have to be reconsidered. The position was totally different now when we were aiming at some 2,000 first line R.A.F. machines. It was not a question of creating a new Air Force under the Admiralty, the number of machines involved would not exceed 500. When he went to the Admiralty he had tried to quieten down this controversy but he had found it impossible and his view was that the Royal Air Force ought to be glad to be quit of these Naval units which must be a nuisance to them, and that the R.A.F. as a whole would not be affected. The Chancellor of the Exchequer (Sir John Simon) said that from a purely Treasury view there ought to be a delay in announcing a change so that the details could be worked out and an opinion formed as to whether it would result in heavy expenditure or not. As a member of the Cabinet, however, he felt that the question must be settled at once. There were a number of disagreeable accompaniments to the controversy which had been taken up by the Press. He could not see, therefore, how the Cabinet could separate without reaching a conclusion; any postponement would leave the Cabinet in a state of doubt and hesitation which from a political point of view would be a serious matter. His only apprehension in supporting the change was lest the sense of soreness should be shifted from one Service to the other. Sir Thomas then suggested certain ways in which the detailed problems of transfer might be solved and pointed out that, financially, the Air Ministry would stand to gain and the interests of economy would also be served.(1)

ibid

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- (1) Under the dual system the Admiralty indented on the Air Ministry for aircraft and reimbursed it for the machines supplied but any expansion of the F.A.A. also entailed a consequential increase in the Air Ministry Votes for training and other overhead expenses. After transfer the Admiralty would no longer be able to increase the Air Ministry Votes in this way.

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All the other members of the Cabinet expressed their agreement with Sir Thomas Inskip's recommendations and in view of this attitude Lord Swinton did not record his formal dissent but he made two formal reservations:-

1. That abroad, all aircraft landed from the Fleet for training must go to Air Force Stations and in such cases the control must be exercised by the R.A.F. Commanding Officer.
2. That as a matter of principle all aircraft operated from the shore should fall within the responsibility of the Air Ministry. In the fullness of time much more naval work would be done from the shore than was the case today. If in the future the Admiralty or the Combined General Staff decided that certain sea units should be replaced by land units these must be Air Force units.

Both these reservations were agreed by the Minister for Co-ordination of Defence. The Prime Minister, summing up, agreed with his colleagues and stated that the dual system could not be allowed to continue because of the ill-feeling between the Services. He expressed the hope that when the change over was made it would be effected in a co-operative spirit - which, in his opinion, had not been so conspicuous at the Admiralty as in the Air Ministry. He asked the First Lord to do his utmost to avoid any manifestations of triumph in his Department, and to urge that the Navy should devote itself to co-operation.

Cabinet approval was therefore given to Sir Thomas Inskip's recommendations and the responsibility for the organisation and administration of the Fleet Air Arm passed to the Admiralty. The two Departments were instructed to work out a scheme of transfer which should be implemented by stages and should take into account the two reservations made by Lord Swinton. The responsibility for research, experiment, development and supply of aircraft and equipment was to remain with the Air Ministry but arrangements were to be made for close liaison on these matters between the two Departments.

These decisions were announced in the House of Commons by the Prime Minister on the following day, 30 July 1937.

(viii) Summary

In spite of the jumping of the gun by the Minister for Co-ordination of Defence, taking everything into consideration the Cabinet decision was undoubtedly the only one that could have terminated the long and bitter controversies which had divided the two Departments, and therein lies its justification. Fortunately the Air Ministry and the Royal Air Force loyally observed the Government's ruling and by a spirit of active co-operation did much to make possible the detailed arrangements for the transfer, which, however, did not take place until 24 May 1939. (1) The profound improvement in

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(1) The actual arrangements and details of the transfer were effected by stages and were not complete until 1941. An account of these protracted negotiations is given at Appendix IX.

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the relations between the two Departments which resulted was shown not only by the friendly outcome of the Joint Staff investigation into Trade Defence Requirements but by a finer partnership with Coastal Command which lasted, except for an awkward period at the end of 1940, throughout the whole of the Second World War. However, there were quite a few, and not only in the Navy, who thought and continued to think that what was sauce for the Fleet Air Arm goose on the claim of specialisation was also sauce for the no less specialised gander of the shorebased maritime squadrons - both ought to have gone to the Admiralty. On the other hand, had not the R.A.F.'s Cinderella daughter been involved in maritime war, perhaps the Bomber and Fighter sisters would not have so wholeheartedly undertaken their immense contributions in minelaying and fighter protection.

CHAPTER XI

COASTAL COMMAND - 1937 TO END OF 1938

(i) Final Trade Defence Requirements and a War Role given to Coastal Command

C.O.S. 621

The Second and Third parts of the Joint Planners report, dealing with a war with Japan, and a war with Japan and Germany, were not approved by the Chiefs of Staff until 4 November 1937. Regarding a war with Japan only, it was assumed that although at peace with Europe, we should be compelled to retain in Home Waters forces sufficient to neutralise the German naval effort in case of a sudden threat developing. The full requirements for shorebased aircraft in the Far East were calculated as three G.R. squadrons, one each at Ceylon, Aden and Penang, two Flying boat squadrons for naval co-operation in the Indian Ocean and possibly one G.R. squadron at Cape Town, numbering in all 60 aircraft. Plans were also made for the reinforcement of Singapore by four squadrons from India and Iraq.

Ibid

For a simultaneous war with both Germany and Japan the arrangements already suggested for the protection of commerce in the case of separate wars still held good but the necessary diversion of naval units to the Far East would increase our aircraft requirements in the European theatre. For this the estimate was for an additional six Flying boats in the Northern Patrol and two further squadrons of G.R. aircraft for work in the northern part of the North Sea. In the Indian Ocean we should only be able to allocate one instead of two Flying Boat Squadrons for naval co-operation. This brought the numbers required at home up to 291 and reduced the Far East requirement to 54 leaving the Atlantic convoy assembly ports abroad at 48 and giving a grand total of 393 aircraft.<sup>(1)</sup>

C.O.S.  
221st Meeting

Among the remarks from the Chiefs of Staff in approving these reports was a categorical assurance given to the Admiralty by the C.A.S. that "where shorebased aircraft were definitely allocated for trade protection and general reconnaissance duties, they would only be detached in time of war for other purposes after consultation by and with the approval of the Chiefs of Staff or, if necessary, some higher authority such as the War Cabinet. Such a decision would only be made in the light of all the circumstances obtaining at the time....." The reasons for this surrender on the matter of principle were:-

- (a) The Air Staff desired to prevent the Admiralty from disputing the alternative employment of the four

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(1) At this date (November 1937) the strength of R.A.F. maritime shorebased forces was:-	
Coastal Command Squadrons - Six F/B,	
Six G.R. and two T/B	= 168
R.A.F. Mediterranean	- One F/B = 6
Eastern Commands	- Three F/B
	and two T/B = 42
Total	- 216

trade defence squadrons<sup>(1)</sup> on the counter air offensive. For since the Government decision in July 1937 to transfer the Fleet Air Arm, this possibility of alternative employment had become the main basis for the contention that the control of all shorebased aircraft should remain vested in the Air Ministry.

- (b) A genuine wish to remove friction with the Admiralty who still believed that at any moment all aircraft employed in co-operation with other Services might be whistled away at the whim of a Supreme Air Commander or the C.A.S. without any reference to the defence situation as a whole.

C.I.D.  
303rd Meeting  
in  
A.M.  
S.36710  
encl. 36A

The object of the long investigation had now been attained and the Joint Staffs had reached agreement on the part which the Royal Air Force was to play in co-operation with the Navy in the defence of trade. The final report (C.O.S. 640) was considered and approved by the Committee of Imperial Defence on 2 December 1937. As regards the numbers of aircraft required<sup>(2)</sup>, the Secretary of State for Air (Lord Swinton) said that the latest Air Force Expansion Programme J had already been framed in accordance with the estimated air requirements for trade protection and it included full provision for the total needs of naval co-operation in the case of the three types of wars for which plans had now been completed. This was not altogether accurate. The programme provided for a Home strength of 225 aircraft to which was added the 56 aircraft unspecified as to duty to make 281. Overseas the provision was nominally 146 but this included 60 aircraft for Singapore and Hong Kong which were not wholly available for trade defence leaving only 86 and making the grand total 367.

C.P. 316 (37)  
15 Dec. 1937

Although Expansion Programme J did not secure Cabinet approval and had to be cut down for financial reasons, trade protection had now been recognised as a matter of the most urgent priority and provision was made for aircraft engaged on naval co-operation duties in the Metropolitan Air Force on

- (1) Four new Trade Defence squadrons (56 aircraft) were included in the current Air Expansion Programme J, drawn up in October 1937, but their precise duty and location was not specified.
- (2) For ease of reference the minimum aircraft requirements were:-

Location	War with Germany alone	War with Japan alone	Simultaneous War Germany and Japan
In Home Waters	261	-	291
In West Atlantic ports	48	-	48
Indian Ocean and Far East	-	60	54
Totals	309	60	393

C.P. 24 (38)  
21 Jan. 1938

the same scale in the revised scheme known as K<sup>(1)</sup> and remained at the figure of 281 in all subsequent expansion programmes.

A.M.  
S.39593  
encl. 14A

Regarding the role of Coastal Command (now shorn of the Fleet Air Arm) the action which had been so long delayed by the necessity to await the results of the Joint Staff inquiry could now at last be taken. Following the assurance given by the C.A.S. it was clear that the primary role allotted to the Command must be naval co-operation. Accordingly on 1 December 1937 the Air Ministry informed the A.O.C.-in-C. that the previous directive of 25 March was cancelled and that the primary role was "trade protection, reconnaissance and co-operation with the Royal Navy."

(ii) The evolution of the first detailed War Plan for the R.A.F.

C.O.S. 340

Concurrently with the long deliberations of the Joint Staff enquiry on requirements for co-operation with the Navy in Defence of Trade was a much wider and equally long study given to the construction of a detailed War Plan for the Armed Forces in the event of war with Germany. The Joint Planning Committee had been given this task by the Committee of Imperial Defence as early as November 1934 but progress was frequently interrupted by other demands upon their time. Their first provisional report was approved by the Chiefs of Staff Committee in August 1935 and dealt with the courses open to Germany in the event of war in 1939. This gave a clear indication as to the primary objectives of the courses open to us which the Joint Planning Committee were then instructed to consider.

C.O.S. 401  
(J.P.)

The two main headings of these were governed by the alleged vulnerability of German industry to air attack and the concept of using the bomber force as a deterrent and stopper to any attack by the German Army upon the Low Countries. The two headings also came into prominence in the lengthy discussions which continued throughout 1936 upon the measures for protection of British trade in the event of war with Germany. It will be remembered from Chapter VIII (iv) that it was generally agreed, even by the Admiralty, that the best method of reducing to manageable proportions the menace of heavy and

(1) Expansion Scheme K was outlined on 21 January 1938 in C.P. 24 (38) and was approved by the Cabinet on 14 March in Cabinet 12 (38). It provided for the undermentioned R.A.F. strength to be completed by 31 March 1941:-

<u>Metropolitan Air Force</u>			
Fighter	- 38(9)	Squadrons -	532
Bomber	- 77(3)	Squadrons -	1,360
Army Co-op.	- 11(4)	Squadrons -	132
Coastal landplanes	- 13(4)	Squadrons -	245
Coastal flying boats	- 6	Squadrons -	36
			} 281
145(20) Squadrons - 2,305 aircraft			

N.B. The numbers in brackets indicate those squadrons which were non-regular auxiliary.

Overseas Air Forces

39 Squadrons of all types - 490 aircraft.

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sustained air attack upon British shipping at sea, ports, and inland communications would be a bombing counter-offensive against Germany's aircraft industry and naval bases. In actual fact the conviction that Germany would attempt a "knock-out blow" by air against the United Kingdom had, before the end of 1936, come to dominate British planning.

The Joint Planners presented their second report on 26 October 1936 dealing with "The courses open to us". Part I stated the general governing considerations, Part II compared the forces of the two nations, not only naval, military and air but also the economic and geographical factors. Part III outlined the counter-measures which the British Services should be ready to adopt. Of these, the most essential were held to be:-

1. To provide for the repelling of an immediate German air offensive.
2. To prepare measures to help Britain's potential allies to repel an immediate land and air offensive against themselves.
3. To provide for a counter-offensive that would bring defeat to the Germans in the second phase of the war.

C.O.S. 513  
(J.P.)

The first, and to a considerable extent the second, must primarily be the concern of the R.A.F. - and in especial the concern of the bomber force. Second only to this came the task, primarily the role of the Royal Navy, of keeping open Britain's sea communications against German sea and air attack but here, too, the R.A.F. must give vital assistance not only by providing sea reconnaissance and local defence but by counter offensive measures against German naval and air bases. The third main task was, during the opening phase, to help the French and Belgians in repelling a German land and air offensive against their countries. This was primarily a matter for the Army's Field Force but here also the R.A.F. would have an important part to play.

This report was considered by the Deputy Chiefs of Staff Sub-Committee and on 5 January 1937 they embodied their views in C.O.S. 540 (D.C.). In this they pointed out that Parts I and II were a little out of date in some particulars and open to differences of opinion upon others. Although endorsing the general conclusions reached, they suggested that these two Parts should not be sent forward to the Committee of Imperial Defence. Part III, however, they recommended should be presented and also that the three Service Departments should now be instructed to examine and prepare precise plans. These views and suggestions were approved by the Chiefs of Staff and a Paper entitled "Planning for a War with Germany" was prepared which was issued by them dated 15 February 1937. After general policy statements the Paper went on to outline the roles of the three Services. It began with the R.A.F. as upon this Service would fall most of the burden of repelling Britain's gravest menace, the German air offensive. Precise proposals were recommended as to the plans to be adopted for R.A.F. bombing

C.O.S. 540

objectives in Germany, plans to assist the Navy in their task, and plans to support the Army.<sup>(1)</sup> After the R.A.F. came the roles of the Navy and then the Army.

The Paper (C.O.S. 549) was approved on 13 May 1937 by the Cabinet Sub-Committee on Defence Plans (Policy) and instructions were given to the Air Ministry to begin the preparation of the necessary detailed operational plans. It was not till October 1937 that the list of plans was accorded priority of importance and could be tabulated specifically as under:-

- W.A.1 - Attack on German Air Force, its maintenance organisation and allied industries.
- W.A.2 - Reconnaissance in home waters and eastern Atlantic in co-operation with the Navy.
- W.A.3 - Co-operation with the Navy in convoy protection in home waters and eastern Atlantic.
- W.A.4 - Attack on concentration areas, lines of communication etc. of the German Army.
- W.A.5 - Attack on German manufacturing sources.
- W.A.6 - Attack on stores, particularly of oil.
- W.A.7 - Counter-offensive in co-operation with the Navy in defence of seaborne trade. By this was understood the attack of enemy naval bases.
- W.A.8 - Night attacks on special warlike stores.
- W.A.9 - Attack on the Kiel Canal.
- W.A.10 - Destruction of German shipping in port and of port facilities, especially Baltic ports.
- W.A.11 - Destruction of forests and crops.
- W.A.12 - Attacks on the German Fleet or parts of it at sea or in harbour.
- W.A.13 - Attacks on German administrative headquarters, especially in Berlin.

The maritime objectives were thus W.A. 2, 3, 7, 9, 10 and 12. Of these, W.A. 2, 3 and 12 were, so far as detailed planning was concerned, the business of Coastal Command but, having no strike force other than two short range Vildebeest torpedo-bomber squadrons, the tasks were confined to W.A. 2 and 3. They were in fact those elaborated at this very time by the Joint Staff enquiry into the protection of seaborne trade and which had resulted in the tardy allocation of a definite primary role for Coastal Command.

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(1) As far as the R.A.F. was concerned, a very full account of the implementation of C.O.S. 549 is given in the A.H.B. Volume "Pre-war evolution of Bomber Command" - Chapter IV (ii) sections(d), (e) and (h).

(iii) The initiation of the Area Combined Headquarters scheme

It has only been briefly mentioned in Chapter VII (iii) how the newly created Coastal "Command" was initially organised on a functional basis, a decision taken presumably in line with the reasoning which obviously separated Bomber and Fighter Commands. However, it was strange that the entirely different conditions for Coastal Units were not appreciated sooner and more generally at the Air Ministry as requiring self-contained groups with headquarters grafted on to the existing system of naval area Commands. As early as May 1935 such a need was realised by the A.O.C. Coastal Area. In his report on the fleet exercise XFB he had stated that one of the most important features was the problem of control of the separate air searching and striking forces in relation to the naval forces with whom they were co-operating. This was largely dependent on close liaison with the various naval command headquarters and could only be achieved efficiently by a system of air operational headquarters with corresponding communication facilities. Moreover, as Coastal Area had no strike force of its own, the bomber squadrons lent from the A.D.G.B. Command could not be effective until Coastal Area had some local operational headquarters from which they could be controlled. Finally, he said, it was apparent that these headquarters would have to be sited geographically to enable them to co-operate with the corresponding naval headquarters.

A.M.  
S. 35068  
encl. 36A

Even more strange was the fact that at the Air Ministry little was then known about the naval organisation for the repulse of seaborne attack on our coasts. It was not till 17 July 1936 that a map was obtained from the Admiralty showing the limits of the Naval Home Commands and not till 16 November was further information received on the subject in reply to an earlier Air Council enquiry of 28 July. From this it was possible for the Air Staff to gain a clearer picture of the Admiralty schemes for coast defence. By the time this had been digested it was early in 1937 and it became apparent that the initial functional grouping of the new Coastal Command was a mistake and that the advice given by the D.C.A.S. (Air Vice-Marshal C. L. Courtney) should be adopted.

A.M.  
S. 32145  
encl. 20A

He envisaged the new Command as consisting of a certain number of squadrons trained to work over the sea in reconnaissance, anti-submarine patrols, convoy protection etc. and that these squadrons, though having permanent locations in peacetime, should be capable of being moved wherever they were most required in time of war. Though the squadrons should be mobile, the organisation for commanding and directing them should be fixed on a geographical basis. The coasts of this country were divided for naval purposes into a number of commands with headquarters at Rosyth, Chatham, Portsmouth, and Plymouth. In war there would be required an Air Group Headquarters to work alongside each of these naval headquarters. Although at some periods there might be few or even no squadrons working from some of these Group Headquarters, the ability was there to reinforce them if the situation required. The Group Headquarters itself would know all the conditions attaching to its own area of coastline i.e. where the convoys were, where the enemy was reputed to be etc., and would therefore be in a position to issue immediate orders to any squadrons under its command.

A.M.  
S. 35818 Part I  
encl. 74A  
and  
Minute by  
D.C.A.S.  
10.1.1937

ibid

A.M.  
S.38451 Part II  
encls. IA, ID  
and IIA

All four Group Headquarters could not be provided in peace but the D.C.A.S. saw no reason why at least two should not be created immediately, each organised to throw off another one in war; there would thus be the four to correspond to the four Naval Headquarters. He suggested that No. 15 Group be established at Plymouth, No. 16 Group at Chatham and the Command Headquarters at Portsmouth. It was the difficulties experienced in the planning and control of the Coast Defence Exercise CDX (13 to 16 July 1937) which brought matters to a head. The object of this exercise was to test the command and co-ordination of the defences (naval, military and air) of the fortresses of Portsmouth, Portland and Plymouth, and to study the detailed handling of the defending forces. Attacks were to be made on these defended ports by naval ships and carrier borne air forces under the control of the C.-in-C. Home Fleet. The area of operations was limited to the western half of the English Channel and the Western approaches to the Bristol Channel. No mobile troops took part but the A/A defences and shore batteries were manned and opportunity was taken for the first full-scale test of the new Air Raid Precaution organisation in Southampton and Portsmouth. The defending air forces consisted of four flying boat squadrons (Londons and Singapores), three G.R. squadrons (Ansons), two torpedo-bomber squadrons (Vildebeests), one heavy bomber squadron (Heyfords), and two fighter squadrons (Fury and Gauntlets). The fighter squadrons were controlled by the A.O.C. No. 11 Group Fighter Command and the rest were under the command of the A.O.C. No. 16 Group Coastal Command. The naval defending forces were under the C.-in-C. Portsmouth (Admiral the Earl of Cork and Orrery).

ibid

The planning of the defence and its general supervision were entrusted to the C.-in-C. Portsmouth, the C.-in-C. Southern Army Command and the A.O.C.-in-C. Coastal Command. It was hoped that these three officers would together form a Directing Staff for the exercise but the Naval C.-in-C. opposed this as he wished to command his own defending forces himself independently. The result was an unsatisfactory compromise with only a Naval Liaison officer on the Directing Staff. The actual control of the defending forces was further hampered by the insistence of the Naval C.-in-C. on maintaining a separate operations room. Moreover, the operation orders were issued independently by the three Commanders and it was inevitable that they showed a marked divergence of ideas between the Services with a failure to appreciate the role and capabilities of the units and weapons of the other. As an exercise it was not a success but it did force remedial measures.

A.M.  
S41960  
encl. 1A

Air Marshal Joubert (C.-in-C. Coastal Command) was quick to act and in a letter dated 26 July 1937<sup>(1)</sup> he advocated the adoption of a unified system of coast defence control based on strategic considerations. To him it seemed that combined staffs in combined operation rooms, the necessity of which was now obvious, could not be superimposed on the existing arrangement in which local Naval Commands were organised on a

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(1) Shortly after writing this letter, on 16 August 1937, Air Marshal Joubert was succeeded as A.O.C.-in-C. by Air Marshal Sir Frederick W. Bowhill, K.C.B., C.M.G., D.S.O.

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Port basis, the Army Commands on an Area basis, and the Air Forces on a functional basis. He proposed that the coast defence should be divided strategically into three main areas - the Channel, the North Sea and the Western Approaches, with possibly a sub-area in the Irish Sea. Each of these areas should be controlled by a combined staff composed of three senior commanders working on equal terms. These would be a Naval C.-in-C. of each coastal area, a coast defence Army Commander and an Air Force Group Commander. This system would reduce the number of authorities responsible for coast defence and thereby simplify the establishment of combined operational headquarters. As an immediate solution of the air aspect he suggested that two more Air Groups should be formed in his Command - one to cover the North Sea area and the other to cover the Western Approaches - making with the existing No. 16 Group three in all, with the Command Headquarters as the co-ordinating authority and direct channel to the Admiralty.

This letter gave a new impulse to the consideration of Coastal Command's peace and war organisation for it drew attention to the urgent need for the formation of additional operational groups, it necessitated the taking of decisions on the higher control of Home Defence operations, and it raised the question of the actual war functions of the Headquarters of Coastal Command. Action was taken at the Air Ministry to implement some of Air Marshal Joubert's recommendations and on 13 October 1937 the Deputy Director of Organisation proposed that General Reconnaissance Group Headquarters<sup>(1)</sup> should be established at Donibristle (Rosyth), at Chatham and at Mount Batten (Plymouth), and for a G.R. Wing Headquarters at Belfast. It was suggested, however, that in peace only the Chatham and Mount Batten Groups should be instituted and that in war the former should throw off the Group Headquarters at Donibristle and the latter the King H. at Belfast. These proposals were approved with minor modifications at an Air Ministry conference on 29 October and communicated provisionally to Coastal Command on 1 December.

A.M.  
S.39593  
encl. 4A

D.C.O.S.  
23rd  
Meeting

The Combined Report on the unsatisfactory 1937 CDX exercise was not issued until 20 December but before this the Deputy Chiefs of Staff had reached agreement in principle on 14 December that Combined or Area Combined Headquarters should be established. The Report merely confirmed this opinion. Further progress was made in their development at a joint staff conference held on 4 January 1938. It was explained to the naval representatives that the Group Headquarters, once established, would be permanent and that no Group would specialise either on trade protection or on reconnaissance only. This marked the definite abandonment of any functional basis in Coastal Command. The Deputy Chief of the Naval Staff expressed his opinion that three operational groups with combined headquarters at Rosyth, Chatham and Plymouth were satisfactory from the point of view of the Navy. The conference then went on to decide the functions of Coastal Command Headquarters in War. It was agreed that the A.O.C.-in-C. would:-

A.M.  
S.40559  
encl. 20A

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(1) In September 1937, the Flying boat squadrons were rated as G.R. squadrons as well as the Anson landplane squadrons.

ibid

1. Act as the chief adviser to the Admiralty and Air Ministry on all home air operations involving naval co-operation.
2. Be responsible for implementing higher strategical decisions on the employment and duties of the G.R. squadrons.
3. Where combined action on the part of several Coastal Command Groups was necessary, he would co-ordinate their air operations.

A.M.  
S.418991  
encl. 8A

It was also decided that the Command Headquarters should instal an Intelligence Centre for assessing and passing up to the Central War Room in London the latest information of interest to the Admiralty received from air reconnaissance sources.<sup>(1)</sup> Finally, the Headquarters was required to maintain liaison with Bomber and Fighter Command headquarters in order to facilitate the general co-ordination of the three home-based Air Commands.

(iv) The Higher Control of Defence Operations

D.C.O.S.  
No. 49

Regarding the first part of Air Marshal Joubert's letter, his suggested re-organisation of the strategic aspect of Coast Defence could only be considered against the general background of the problem of Home Defence operations as a whole and this part of his letter gave the Air Staff the opportunity of urging a decision on the larger question. On 17 August 1937 the C.A.S. wrote to the Secretary of the Committee of Imperial Defence proposing that at an early date the Chiefs of Staff Sub-Committee should consider an Air Ministry memorandum on this subject entitled "The Co-ordination of Defence Operations." This paper had been submitted to the Minister for Co-ordination of Defence at the time of the enquiry into the manning of the Fleet Air Arm (the First Inskip Enquiry) but, as it raised large issues not directly concerned with that controversy, consideration of it had been deferred. The C.A.S.'s proposal was agreed to and this 1936 Memorandum was referred for discussion to the Deputy Chiefs of Staff. Briefly it put forward the idea that all the forces concerned with the security and defence of the United Kingdom should be controlled by three Supreme Home Defence Commanders acting through a Joint Staff.

Since the re-organisation of the R.A.F. in 1935/36, the Air Ministry had provisionally decided that in War the co-ordination of the operational effort of all the home-based Air Commands should be entrusted to a Supreme Air Commander and the proposals in the memorandum would have involved a similar policy for the other two Services. However, when it ultimately came before the Deputy Chiefs of Staff in September 1937 it was soon apparent that the difficulties of appointing a Supreme Naval Commander were considered insuperable by the Admiralty. Furthermore, the Air Staff itself

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(1) A separate Intelligence Staff was appointed to H.Q. Coastal Command in February 1938 and an organisation was drawn up for Intelligence Staffs throughout the Command. Ref: A.M. S.49937 encl. 1A.

SECRET

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A.M.  
S.45085  
Part I  
encl. 1A

were now of the opinion that the appointment of a Supreme Air Commander was not practicable. For these and other reasons the memorandum was rejected by the Deputy Chiefs of Staff on 15 October(1) and they were asked to investigate the whole problem of the higher control of defence operations.

C.I.D.  
1425-B  
in  
A.H.B.  
IB/3/26  
& 27

On 22 April 1938 the report by the Deputy Chiefs of Staff was submitted. It recommended that there should be established in London a War Room in each Service Department based on the Admiralty model of the last war, and a combined Operational Intelligence Centre to be known as the Central War Room. This was to be equipped with maps and charts and connected by specially protected telephone circuits to the War Rooms in the Service Departments and certain other Ministries. Here the Chiefs of Staffs should meet to review the current situation, make future plans and take broad strategical decisions as to the disposition and employment of the defence forces. A special need for co-ordination was held to exist where a divided responsibility for defence within a definite geographical area was shared between two or more of the three Services. Such a situation arose in four separate spheres - Home Defence against air attack; Internal Security; defence of Defended Ports in the United Kingdom; and combined Naval and Air operations in Home Waters.

ibid

It is only necessary in this narrative to consider the co-ordination as presented by naval and air operations in Home Waters. The report emphasised that in this sphere very close co-operation would be required. As far as the routine defence of shipping was concerned it was considered that at Rosyth, the Nore and Plymouth there should be established Area Combined Headquarters to be used by the Naval and Air Force Commanders controlling the units of those Services in the area concerned. Contact with the appropriate Army Command was to be maintained by a Liaison Officer. As regarded naval air reconnaissance other than that provided by the Fleet Air Arm it had been agreed that it would normally be covered by Coastal Command's routine air reconnaissance over the North Sea. Minor variations could be arranged between the C.-in-C. Grand Fleet and the nearest A.C.H.Q. Major variations to meet specific requests of the C.-in-C. Grand Fleet or other Naval Commanders would be referred to the Admiralty and a decision might be obtained either as the result of consultation between the Admiralty and the A.O.C.-in-C. Coastal Command or, if necessary, by reference to the Central War Room.

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- (1) One important consequence of this rejection was the reorganisation of the Air Staff during the winter of 1937/38. The post of Assistant Chief of the Air Staff was introduced and the Operations Division was sub-divided into two branches to deal with Home and Overseas air operations. Thus the executive direction of Air War would be exercised from the Air Ministry on lines similar to those in force at the Admiralty for Naval War. The new post of A.C.A.S. was filled by the appointment of Air Vice-Marshal W. Sholto Douglas on 17 February 1938 and on 7 March Group Captain D. F. Stevenson became D.D.Ops. (Home) and Wing Commander W. C. Coryton D.D. Ops. (Overseas).

Ref: A.M.S.43508.

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321st Meeting  
of the C.I.D.

All the above recommendations were approved by the Committee of Imperial Defence on 5 May 1938 and towards the end of June the outline was communicated to all home-based Air Commands and Groups<sup>(1)</sup> while the Admiralty took similar steps to inform all Naval Commands. The Area Combined Headquarters scheme was now on an officially recognised basis.

(v) The Area Combined Headquarter Scheme under test

A.M.  
S.42857

In the spring of 1938 discussions were proceeding for a combined Coast Defence and Trade Protection exercise in July. As these progressed the emphasis on combined operational headquarters became more marked and in the end the exercise was regarded as a test for the newly devised system of Area Combined Headquarters. To a lesser extent it was meant to exercise Coastal Command units in their special duty of North Sea Reconnaissance and to give Fighter Command some idea of the amount of interference which the routine patrols would register on the newly installed R.D.F. air warning system along the East Coast.

ibid

The 1938 C.D.X. was planned to represent the initial stages of hostilities between "Blueland" (Germany) and "Redland" (Great Britain) in which the protection of our sea-borne trade (before convoy was instituted) would involve the stopping of enemy commerce raiders or warships from breaking out into the Atlantic round the north of Scotland. The raiders were supposed to have left harbour just before the declaration of war and their attempted break-out was to be covered by attacks against Redland defended ports on the East Coast using both ships and aircraft. Intelligence of these hostile intentions was supposed to have reached Redland before the declaration of war.

ibid

On the attacking Blueland side were the bulk of the Home Fleet and the aircraft of the Fleet Air Arm.<sup>(2)</sup> On the defending Redland side were skeleton naval forces representing a total strength of nine capital ships, fifteen 6 inch gun cruisers and eight destroyer flotillas. The defending air forces consisted of eight G.R. squadrons (three flying boat and five landplane), one torpedo-bomber squadron, four Fighter squadrons and six Coast Artillery Co-operation aircraft. Although all the G.R. squadrons belonged to No. 16 Group (which was as yet the only Coastal Command Group), for the purpose of the exercise three flying boat squadrons and two landplane squadrons were placed under the control of an A.O.C. who shared a temporary combined operational headquarters with the Admiral Commanding the coast of Scotland at Donibristle.<sup>(3)</sup>

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- (1) Copies of C.I.D. Paper No. 1425-B were despatched to these authorities shortly afterwards.
  - (2) These comprised four battleships, four cruisers, two destroyer flotillas and one flotilla of submarines. Two aircraft carriers operated independently representing shore bomber bases and between them carried five squadrons of Fleet Air Arm aircraft.
  - (3) Although the A.O.C. was referred to in this exercise as commanding No. 18 Group, this Group did not actually form until 1 November 1938.

The other three landplane G.R. squadrons and the torpedo-bomber squadron were controlled by a temporary No. 16 Group Headquarters at Chatham where the operation room was shared with the Naval C.-in-C. Nore. The four Fighter squadrons, operating from Sector Stations at North Weald and Hornchurch, were controlled by No. 11 Fighter Group headquarters at Uxbridge. Fortress Combined Headquarters were established at the Forth, Tyne, Harwich, Medway and Thames to control the sea front defences of these points.

ibid

The whole exercise was directed and controlled from the Admiralty War Room, one half of which was occupied by the Directing Staff - A.C.N.S., D.C.A.S., and the G.O.C. Eastern Command with their respective staffs, the other half was used by the Operational Staff - D.C.N.S. controlling the Red naval forces and the A.O.C.-in-C. Coastal Command the G.R. force.<sup>(1)</sup> The exercise began early on 20 July and ended late on the 22nd, the area of operations being bounded on the south by a line drawn from the South Foreland to Cape Gris Nez and on the north by the latitude of 62°N. Bad weather on the first day curtailed a number of air patrols in the northern part of the North Sea but systematic sweeps were flown by the Anson squadrons up to 180 miles from the coast throughout and they also maintained an "endless chain" patrol covering a distance of 220 miles northeastward from Montrose towards the southern end of Norway. There was a very marked improvement in reconnaissance by both the flying boats and Ansons, and the accuracy of reports enabled all the attacking ships to be brought to action by the defending forces. One of the commerce raiders was located but just escaped interception through delay in transmitting the sighting report. The other did not observe the rules of the exercise and failed to enter the area of operations. Useful lessons emerged on the design of patrols, some of which were unnecessarily complicated, but the general success of the reconnaissance made a great impression upon the Naval Directing Staff. The main fault revealed lay in the serious delays in the A.C.H.Q.s of the transmission of important messages reporting the movements of enemy sea and air forces. This was due partly to the teleprinters being overburdened with messages about movements of defending aircraft and partly to an over-elaboration of procedure in the handling of enemy reports. These weaknesses were investigated and remedied without much difficulty soon after the exercise.

A.M.  
S.45979

ibid

A second fault revealed was due to poor liaison with the Fighter Command Group. It had been hoped that interceptions of attacking aircraft would result from reports of their activity sent in by Coastal Command aircraft while on patrol over the North Sea but delay in re-transmission deprived such reports of all value to Fighter Command. Similarly the method of identifying the defending Coastal air patrols was so defective that the information derived from the R.D.F. warning system proved useless to No. 11 Fighter Group for direct interception of attacking aircraft. These defects were also investigated later and more satisfactory arrangements were made by November.

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(1) The actual Coastal Command Headquarters were still at Lee-on-Solent but for the purpose of the exercise were regarded as being in or near London.

Summary

This exercise was the most important of the naval co-operation tests which had been held by Coastal Command. The confusion during and the recriminations after the 1937 C.D.X. were completely absent on this occasion which demonstrated the essential soundness of the A.C.H.Q. system. It also proved valuable in that it clarified the operational status of the A.O.C.-in-C. Coastal Command and showed clearly that he must have his own Operations Room at his own headquarters where he could co-ordinate the operations of his Groups under normal conditions. It also indicated that a place should be reserved for him and his staff in the Admiralty War Room for use in emergency. There was, however, one fundamental weakness which still remained and that was the fact that only one Operational Group (No. 16) had as yet been formed and that its permanent headquarters, together with the Command headquarters, were still at Lee-on-Solent.

(vi) Other operational and training exercises in 1938

The increased range and frequency of exercises, which was so marked during 1937, continued for most of 1938. The first Fleet Exercise took place between 17 and 19 January in which one flying boat, one torpedo-bomber and three Anson squadrons carried out initial searches, day and night shadowing followed by bombing and torpedo attacks. In March a five day combined Fleet Exercise (XJC) against the Fleet returning from Gibraltar provided practice in flying boat searches up to 400 miles from base with subsequent shadowing by four squadrons which was taken up in due course by Anson squadrons<sup>(1)</sup> and culminating in bombing and torpedo attacks. Many exercises were carried out up to August in co-operation with the Anti-Submarine School at Portland but these were purely as screens or escorts and did not include air attack on submarines. Other exercises with the submarine flotillas were also of a reconnoitring nature rather than active counter-measures. Frequent torpedo attack training was done against single ship targets and bombing of the Centurion took place during June and July.

After March there were no big combined exercises until the July C.D.X. Exercise which has been described in the previous section but it is of note that taking part in this were the first two of the new Sunderland four engined flying boats with which No. 210 Squadron was then re-arming.<sup>(2)</sup> The Munich crisis put a stop to all exercises in August and September and during October only special escort training was done by No. 217 Squadron with the A/S School at Portland.

November saw another large Fleet Exercise. This was XJM which took place between the 13th and 16th during the passage of the Home Fleet from Rosyth to the Channel and had as objectives the exercising of shorebased aircraft in locating,

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- (1) It was stressed in the report on this exercise that navigational inaccuracy was such that the average error in reporting ship positions was 24 miles.  
Ref: A.H.B./IHK/47/4.
  - (2) The only other squadron being supplied with Sunderlands at this time was No. 230 at Singapore.

shadowing and attack, and the testing of passing information to the C.-in-C. Home Fleet when at sea. The Area Combined Headquarters at Donibristle and Chatham were manned and Nos. 18 and 16 Groups controlled in all three squadrons of flying boats, four G.R. landplane squadrons, the G.R. School aircraft and one torpedo bomber squadron. Their task was to locate as soon as possible and make attacks on the Home Fleet consisting of three battleships, one aircraft carrier, five cruisers and twenty-five destroyers.

The weather was typically North Sea winter and no reconnaissance was possible until midday/14 November. Then the No. 18 Group Searches sighted the force but failed to stop to shadow and did not regain touch for 2½ hours when on their return tracks. A signal to attack never materialised owing to a misunderstanding and it was only much later, near dusk, that one Sunderland contacted the force and shadowed for four hours. The navigation of all aircraft was poor, reports being as much as eight miles in error on ships only twelve miles from land. On the 15th the force was relocated by No. 16 Group aircraft and shadowing with some attacks lasted for some three hours in the forenoon until fog put an end to all air operations. The accuracy of reporting was a little better being only six miles in error to start with but fell off rapidly as the visibility deteriorated. Poor weather at first hampered operations again on the 16th but the force was discovered early in the afternoon in the eastern Channel by the G.R. School aircraft and shortly afterwards was attacked by the torpedo bomber squadron.

The main conclusions of the exercise were the continued inaccuracy of navigation, faults in W/T signalling and the procedure for identifying aircraft on patrol, faults in ship recognition, and delays in the Operation Rooms caused by inexperienced personnel. As the Director of Staff Duties said in his report, most if not all of the mistakes could only be corrected by more time being given to training.

One interesting exercise occurred in December when No. 217 Squadron was instructed to search in the Channel for foreign submarines reported to be passing through towards the Atlantic. Six German U-boats were located on the surface and all were well photographed.

(vii) The growth of a detailed War Plan for Coastal Command

The work of compiling detailed plans for naval co-operation was complex and involved triangular discussions between the Admiralty, the Air Ministry and the headquarters staff of Coastal Command. The first problem was settling the priorities between the various tasks. Discussions between the Naval and Air Staffs in December 1937 and early January 1938 enabled preliminary plans to be drawn up. The tasks were:-

1. North Sea Reconnaissance

At this date the Admiralty were not anxious about any potential threat from the German Battle Fleet. Owing to the limitations on German construction in the 1935 Anglo-German Naval Agreement it would be some time before the German Navy would be able to present any open challenge to our own Grand Fleet. Similarly, the Naval Staff were confident that the German submarine menace would present no insuperable problem.

A.H.B.  
IHK/47/4

The most serious danger, in their view, would be likely to come from powerful commerce raiders, who would endeavour to reach our trade routes without being challenged. The prerequisite for any successful counter-measures was effective reconnaissance in the North Sea. Cruiser reconnaissance was difficult and, under the modern threat of enemy air attack, hazardous to maintain. That performed by submarines was, with the growing improvement likely in enemy anti-submarine measures, both dangerous and unremunerative; moreover, the Admiralty intended to use them in an offensive role. In these circumstances the Naval Staff were compelled to rely on effective air reconnaissance for the spotting of German commerce raiders trying to break out into the Atlantic. From this it was clear that Coastal Command's primary task in war would be North Sea Reconnaissance. A further type for which provision had to be made was special Fleet Reconnaissance designed to assist the operations of the C.-in-C. Grand Fleet but this would only be required when actual reports were received of enemy naval movements.

## 2. Co-operation with the Northern Patrol

This surface patrol was to be carried out by a force of eight cruisers, based on Kirkwall, who were to sweep the area between the Shetlands and Norway. The aircraft engaged in co-operation were needed to cover the gaps between the cruisers and to divert merchant vessels either for the surface patrol to board or for examination at Kirkwall.

## 3. Anti-submarine Co-operation

The form of this would depend upon the policy adopted by the Germans. If attacks were made on our seaborne trade in compliance with international law, air co-operation would be needed with the nineteen groups of submarine hunting surface units which the Admiralty proposed to use in a so-called "offensive role" at scattered points around the coastline.<sup>(1)</sup> If unrestricted warfare was opened, air co-operation would be with the same anti-submarine forces which would now be employed in a so-called "defensive role" of escort to convoys. It will be remembered from Chapter VIII (vii) that the minimum aircraft requirements for these Home Water tasks had been laid down in C.O.S. 640 as 261 aircraft for a war with Germany alone and 291 for a simultaneous German/Japanese war. To meet these requirements the Air Ministry forecast that Coastal Command would have available:-

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- (1) The bases for these nineteen groups were to be at:-  
Lerwick (for the Northern Patrol area), Kirkwall (for the Fair Isle Channel), Scapa Flow (for the Pentland Firth), Aberdeen, Leith (for the Firth of Forth), Tyne, Humber, Harwich, Sheerness (for the Thames area), Dover, Portsmouth, Plymouth, Falmouth, Milford Haven (for the Bristol Channel), Queenstown, Larne (for the North Channel), Lough Swilly, and Stornoway.

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By 1 April 1938

5 G.R. Anson squadrons	- 90 aircraft)	} 136
5 G.R. flying boat squadrons	- 30 aircraft)	
1 T/B squadron*	- 16 aircraft)	

By 1 April 1939

7 G.R. Anson squadrons	- 126 aircraft)	} 194
6 G.R. flying boat squadrons	- 36 aircraft)	
2 T/B squadrons*	- 32 aircraft)	

\* Strictly speaking the T/B squadrons were not trade protection and at this time were regarded as part of the Air Strike force.

Acting on the Air Ministry's forecasted figures, the Naval Plans Division at the Admiralty drew up a proposed allocation table as under:-

War with Germany alone - Pre-convoy

	<u>April 1938</u>	<u>April 1939</u>	<u>Full requirement</u>
North Sea Recce.	84	84	84
Northern Patrol	12	12	12
Anti-sub. patrols (1)	40	98	114
	<u>136</u>	<u>194</u>	<u>210</u>

War with Germany alone - Convoy in force

North Sea Recce.	84	84	84
Northern Patrol	6	12	12
Convoy escorts	46	98	165
	<u>136</u>	<u>194</u>	<u>261</u>

Simultaneous war - Pre-convoy

North Sea Recce.	84	84	108
Northern Patrol	12	18	18
Anti-sub. patrols	40	92	114
	<u>136</u>	<u>194</u>	<u>240</u>

Simultaneous War - Convoy in force

North Sea Recce.	84	108	108
Northern Patrol	12	18	18
Convoy escorts	40	68	165
	<u>136</u>	<u>194</u>	<u>291</u>

- (1) Six aircraft were allocated for each of the nineteen surface groups so that there could always be one aircraft continuously with the Group.

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From these figures it can be seen that the Admiralty regarded the North Sea Reconnaissance as the first priority - a deficiency of 24 aircraft in 1938 only being accepted in the case of simultaneous war with Germany and Japan. It was also regarded as necessary for the Northern Patrol to always have at least six aircraft. Thus, where deficiencies were inevitable they were to be accepted at the expense of anti-submarine patrols and convoy escorts. These allocations were provisionally accepted at a joint meeting of Naval and Air Staff representatives on 21 December 1937.

It was now possible for Coastal Command Staff to design a system of patrols and suggest appropriate war stations for its squadrons. The problem of disposition was exceedingly complex. In the first place, operational considerations made it impossible for the war stations to correspond with the peacetime stations. Among the reasons for this were that the G.R. land-plane squadrons' range was so short that in war they would have to be stationed as near as possible to their patrol line, there was a shortage of G.R. airfields on the vital stretch of the northeastern coastline, and owing to the lack of adequate torpedo training facilities in the North, the torpedo/bomber squadrons had, in peace, to be located in the south while in war they could only be profitably employed in the northeast. In the second place, two sets of dispositions had to be planned - one to cover the current Phase V of the Western Plan and another to correspond to the ultimate strength and equipment of squadrons under the current expansion scheme. In order not to disturb the signals communications designed for the ultimate dispositions and to minimise the unavoidable moves from peace to war stations, it was necessary to ensure that the Phase V emergency dispositions corresponded, whenever practicable, to the ultimate positions. Lastly, the planning of the patrol system and decisions on the emergency dispositions were complicated by changes in the Admiralty war plans and in the naval coast defence and convoy organisations.

Plans for the employment of squadrons under Phase V (April to October 1938) were completed by April. Under these the North Sea Reconnaissance in the southern half was to be done by Nos. 269, 224, 233, 206 and 220 G.R. Anson squadrons. Two searches daily in this area were required from each squadron when the visibility was over five miles. The aircraft were to carry two bombs, either the 100 lb. anti-submarine or the 120 lb. G.P., for use against surfaced submarines, armed merchant raiders or hostile aircraft carriers. The flying boat squadrons in this 1938 plan were all to operate on anti-submarine searches in conjunction with the 19 surface hunting groups - Nos. 204, 210 and 228 Squadrons were located in the southwest to cover the Western Approaches, No. 201 Squadron in the Orkneys was to co-operate between the Hebrides and Shetlands, and No. 209 Squadron was to cover the Firth of Forth area. Each flying-boat squadron was expected, on the average, to patrol four areas (50 by 20 miles in extent) along the routes used by shipping and each flying boat was to carry a minimum of two 250 lb. G.P. bombs. No. 42 T/B Squadron, based at Donibristle, was required to act as a striking force against any enemy ships coming within their range. Nos. 217 G.R. and 22 T/B Squadrons were to act as reserves. All aircraft were to be controlled by No. 16 Group H.Q. at Lee-on-Solent.

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However, the final emergency dispositions of squadrons for Phase V were not settled till 16 June 1938 because in order to

provide the number of G.R. squadrons necessary to meet the current naval requirements the existing scale of reserves behind the landplane squadrons had to be abandoned and six instead of five of these units were to be mobilised if necessary. There was also a redistribution of flying boat squadrons. It was pointed out at the Air Ministry conference that the squadrons operating from East Coast stations could, with the exception of those now to be based at Invergordon, be expected to reach their war stations between 24 and 48 hours after receiving notice to move. The dispositions were as under:-

<u>Rosyth Group H.Q.</u>	<u>Command H.Q.</u>	<u>Chatham Group H.Q.</u>
<u>Invergordon</u>	<u>Mount Batten</u>	<u>Bircham Newton</u>
No. 201 No. 228	No. 204	No. 206 No. 220
<u>Tayport</u>	<u>Pembroke Dock</u>	<u>Thornaby</u>
No. 209	No. 210	No. 42
<u>Leuchars</u>	<u>Warmwell</u>	
No. 224 No. 233	No. 217	
<u>Montrose</u>		
No. 269		

These paper preparations assumed a new air of reality and purpose when the Munich crisis blew up towards the end of September 1938 culminating in a state of national emergency being declared on 26 September.

(viii) - The Munich Crisis as it affected Coastal Command

The crisis began with the annual Nazi rally at Nuremberg which opened on 5 September 1938. It became acute after Hitler's speech there on the 12th. Thereafter it rose in a crescendo of intensity through Chamberlain's flying visits to Hitler on the 15th and from the 22nd to the 24th. It was eventually ended, after Mussolini's mediation on the 28th, by the Munich Agreement of 29 September 1938.

It did not prove such a turning point in the evolution of Coastal Command as it did in that of the other home-based R.A.F. Commands. It did not substantially affect the development of the general war plans for naval co-operation, neither did it do more than temporarily interrupt and then accelerate the normal evolution of the Command's war organisation. The shortness of the emergency prevented any useful operational experience being gained by the squadrons, so that the main importance of the crisis was that it provided a test of the Command's mobilisation arrangements and revealed certain operational shortages and deficiencies which the avoidance of war fortunately enabled to be remedied at a later stage. Most of the serious difficulties encountered during the crisis had actually been foreseen by the Command Staff and been pointed out to the Air Ministry. The main conclusion drawn from the emergency was the urgent need to accelerate Expansion Scheme L,

which itself was an accelerated programme.<sup>(1)</sup> The following were among the main difficulties and defects revealed:-

(a) In the Group Organisation

No. 18 Group  
O.R.B.

The chief difficulty which confronted Coastal Command when the state of national emergency was declared on 26 September arose from the fact that only one Operational Group (No. 16) was in existence. Luckily, arrangements were already in hand for the formation of No. 18 Group at Rosyth in view of a projected trade protection exercise scheduled to take place from 18 to 20 October<sup>(2)</sup> and the Group staff had actually begun to collect at Lee-on-Solent on 1 September. They were moved to Donibristle on 26 September and on the following day Air Commodore C. D. Breese, hitherto of No. 17 Training Group, was appointed A.O.C. No. 18 Group with Group Captain I. T. Lloyd becoming his Senior Air Staff Officer on the 29th. No. 18 Group was given the control of Nos. 201, 209 and 228 flying boat squadrons with war stations at Invergordon, No. 210 flying boat squadron at Tayport, and Nos. 224 and 233 Anson squadrons at Leuchars and Montrose respectively.

No. 16 Group  
O.R.B.

No. 16 Group was placed under the command of Group Captain R. L. G. Marix and moved to its war station at Chatham on 27 September. This Group headquarters controlled Nos. 206 and 220 Anson squadrons at Bircham Newton, and No. 269 Anson squadron together with No. 42 Vildebeest T/B squadron at Thornaby.

- (1) On 12 March 1938, just as the Cabinet were approving Expansion Scheme K, Hitler sent his troops into Austria. This brought the possibility of war appreciably nearer and a new Scheme L was hurriedly put forward in C.P.86(38) dated 1 April and approved by the Cabinet on 27 April 1938. It was an all-out effort to accelerate Scheme K. Double shifts were to be worked in the aircraft industry and regardless of cost the programme was to be completed by 31 March 1940. Even so, it was estimated that the total strength would be at least 20 squadrons behind Germany's force at this date.

The narrow escape from war during the Munich crisis resulted in Expansion Scheme M, outlined in C.P.218(38) dated 25 October and approved in principle by the Cabinet on 7 November 1938 (Cab.53(38)). This provided for an increase to 50 Squadrons of Fighters (800 aircraft) and an all-heavy Bomber force of 85 squadrons (1,360 aircraft) by 31 March 1942. There was no alteration in the strength of Coastal Command, which remained at a total of 281 aircraft but the Overseas forces were to be increased to 49 squadrons of 636 aircraft of all types.

- (2) This was exercise XJK, details of which were issued on 17 September. The objects of the exercise, which had to be abandoned owing to the crisis, were to test Phase VI of the Western Plan in so far as it could prevent the escape of enemy surface craft into the Atlantic and to try out recognition procedure - Ref: A.M. S.46230 encl. 6B.

Shortages of personnel did not allow the formation of No. 15 Group, which would otherwise have been at Plymouth, so the Command Headquarters at Lee-on-Solent took over the control of No. 204 flying boat squadron at Mount Batten and No. 217 Anson squadron at Warmwell.

At Chatham and Donibristle only temporary Area Combined Headquarters were available and these were manned by hastily assembled officer operations staff. Owing to shortages in these, No. 16 Group started working its operations block on 28 September on a two-watch basis and the Chief Signals Officer was compelled to instruct officers' wives in the decoding of cyphers at the height of the crisis. No. 18 Group only managed to man its operations room by transfers from the other groups or from the stations at Calshot, Ford and Donibristle. If war had come there would have been confusion in the Area Combined Headquarters because there was no common inter-service method for referring to geographical positions for at this time Bomber and Coastal Commands used a graticule, the Army and Fighter Command another kind of grid, and the Navy ordinary latitude and longitude with compass bearings.

Nos. 16 and 18  
Group O.R.Bs.

A.M.  
S.46848  
encl. 44B

(b) Moves of squadrons to War Stations

A second difficulty experienced by the Command was the complicated set of moves from peace to war stations. Of the fifteen squadrons in the Command only twelve were mobilisable for operations<sup>(1)</sup> and of these no less than eight had to move at least 270 miles from their peacetime stations. As an example of their experiences, No. 209 flying boat squadron, located in peace at Felixstowe, was ordered to Invergorden on 26 September. Of the six boats which left on the 27th only one succeeded in reaching its destination that day owing to thick fog being encountered. Four aircraft reached various parts of Yorkshire and one was forced to return to Felixstowe. Three ultimately arrived at their war station on the 29th but it was not until the following day, when the crisis was over, that the squadron was complete at Invergorden.

No. 209 Sqdn.  
O.R.B.

An unnecessary complication arose during the crisis because the Royal Air Force was not mobilised. The Royal Navy had been mobilised on 28 September and it would have greatly facilitated the moves of Coastal Command squadrons if they too could have been mobilised at the same time. As it was the squadrons moved on their peacetime establishments resulting in many handicaps including an acute shortage of mechanical transport. It was one of the curious features of the Munich crisis that the country was brought to the brink of war without Governmental initiation of any precautionary stage or proclamation of general mobilisation.

(c) In the Operational Units

In war or emergency, certain Coastal Command squadrons were obliged, at this date, to move to stations controlled by other R.A.F. Commands. For example, Montrose and

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(1) Nos. 22, 48 and 240 Squadrons were engaged on training duties.

Warmwell were Training Command airfields, while Thornaby belonged to Bomber Command. This situation caused two types of difficulty during the crisis. Firstly, some difference of opinion arose between Training and Coastal Commands over the facilities to be made available at Montrose and Warmwell, accommodation being insufficient for the G.R. "lodge units". Secondly, the responsibility for the maintenance of bombs, ammunition and pyrotechnics at Thornaby and Evanton (for Invergordon) was undefined and stocks of these and ancillary equipment were short. Only one mobile torpedo base was eventually made available for No. 42 Squadron at Thornaby and this was not powerful enough to charge torpedoes.

All three types of aircraft in the Command experienced their own particular maintenance difficulties. The most serious, if operations had been prolonged, was the lack of any spare Cheetah IX or Pegasus X engines for the Anson and flying boat squadrons. Pinnaces and seaplane tenders for the refuelling and bombing-up of the flying boat squadrons at Invergordon and Tayport had to be sent north by sea and did not arrive till the crisis was over. No flying boat repair depot was available and for major inspections the flying boats would have had to be sent back to their peace stations. No. 210 Squadron, recently re-equipped with the new Sunderland flying boat, was handicapped by the lack of essential maintenance gear and by the absence as yet of any Air Publication dealing with the question of maintenance.

(d) The calling up of Reservists

The early termination of the crisis saved the signals organisation of the Command considerable embarrassment in relation to the calling up of civilian employees belonging to the reserves of other Services. Owing to the shortage of trained R.A.F. Signals Reservists, a number of Naval and Army reservists were employed. The calling up of these men in the early stages of the emergency would have materially affected the efficiency of the signals organisation and the situation was only saved by an Air Ministry Signal authorising the retention for seven days of War Office and Admiralty Reservists. If the crisis had been prolonged beyond this period of grace the exodus of this skilled personnel would have had serious results. The Command also suffered from the withdrawal of R.A.F. Reservists from key posts in the Signals Branch for service with other R.A.F. stations and formations.

(e) Liaison with the Admiralty

Finally, the liaison between the Command Headquarters at Lee-on-Solent and the Admiralty was inadequate. The 1938 C.D.X. exercise had demonstrated how necessary it was, from the point of view of operational control, that the Air Officer Commanding-in-Chief should work in close conjunction with the higher naval control in the Admiralty War Room. It was symptomatic of this inadequacy that the Admiralty, who had brought into force a key memorandum on secret recognition procedure on 28 September, did not inform the Command of this step until several days later.

A.M.  
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encl. 4C

C.C. Report on  
Munich Crisis  
Para. 10

(f) Summary

The crisis may be said to have ended, so far as Coastal Command was concerned, on 6 October 1938 when squadrons were instructed to return to their peace stations. By 11 October both Nos. 16 and 18 Group Headquarters were back at Lee-on-Solent.

How far would the Command have been able to fulfil its responsibilities if war had broken out? Exercise C.D.X. had shown that the system of operational control was fundamentally sound and that Admiralty requirements for routine North Sea reconnaissance could have been met initially. It would, however, have been some time before the operations rooms at the Area Combined Headquarters could have been working satisfactorily. The inadequate facilities for the flying boat squadrons and maintenance difficulties would soon have imposed a severe limit upon flying operations. Air protection for the convoys in the Western Approaches would have been scanty, and the general lack of war reserve aircraft and equipment would, in the face of the enemy, have brought operations to a grinding halt in a measurable time.

(ix) - Correction of defects revealed in the Munich Crisis

The breathing space afforded after this dress rehearsal for war was of inestimable value to all the Armed Forces and not least to Coastal Command. The immediate preoccupation of the Command was to rectify the defects and deficiencies which had come to light. The measures taken are for convenience listed as follows:-

(a) Simplification of moves from peace to war stations

This was, in many ways, the most urgent problem but unfortunately no easy or quick solution was possible. Nothing at all could be done in this direction so far as mobilisation under the emergency schemes of the Western Plan was concerned. Plans made as the current expansion scheme matured were also purely conditional. They depended mainly on the re-equipment of squadrons to new types and upon the development of new airfields but both required time to be fulfilled and were subject to delays in production. Thus, although arrangements were made on 3 November 1938 to reduce the number of moves of land-plane squadrons under the ultimate scheme for mobilisation from nine to four, they hinged on the provision of airfields at Wick and St. Eval which were not expected to be completed until December 1939. The moves of the three flying boat squadrons to Scotland could not be eliminated owing to the necessity of training them in the south of England.

Both Training and Coastal Commands had drawn attention in their reports on the Munich crisis to the need for regularising the position of the Coastal "lodger" units. During the emergency contradictory rulings had been given on this question by the Air Ministry, Coastal Command having been informed that their operational squadrons had priority in every respect, while Training Command had been told that the G.R. squadrons at Montrose and Warmwell should be afforded only such facilities as were available

C.C.  
S.9069  
Part II  
encl. 23B

A.M.  
S.47182  
encl. 6A

after the increased flying training requirements had been met. On 23 November 1938 the Air Ministry clarified the position by ruling that "the need of Coastal Command to be in a position to operate at maximum effort from or even before the commencement of hostilities makes it essential that they shall have first call on facilities at such stations". Operational units were, however, to be as far as possible self-contained in order that the strain on the Training Command stations should not be excessive.

(b) Mitigation of engine shortage

Every effort was made to increase the production of Cheetah IX and Pegasus X engines, but the only immediate step that could be taken was to impose certain flying restrictions within the Command during Phase VI (Oct. 1938 to Apr. 1939) of the Western Plan. Provided a state of emergency did not recur during this period:-

A.M.  
S.48345  
encl. 7A

1. The flying hours of all aircraft types, except the Sunderland I flying boats, were limited to 10 hours per month per aircraft.(1)
2. All aircraft were required to fly at economical cruising speeds.

The production of Cheetah and Pegasus engines steadily improved during the summer months of 1939 but the shortage had not been eliminated even by the following September.

(c) Provision of mobile torpedo bases and a depot ship for flying boats

Late in October the C.A.S. gave a ruling that more efficient mobile torpedo bases were to be provided for the two torpedo-bomber squadrons. These bases were expected to become available by April 1939 but, even at the end of August, only one had been produced and this was located at Bircham Newton for the use of No. 42 Squadron.

In order to avoid the necessity for flying boats to return to their peace stations for major inspections the A.O.C.-in-C. suggested the provision of depot ships as bases which would not only solve this problem but would confer greater mobility on flying boat squadrons either at home or abroad. After repeated representations by him, the Air Ministry at last decided in May 1939 to charter and fit out one depot ship. S.S. Manela was accordingly taken up and fitted to accommodate a G.R. Wing and two flying boat squadrons. It came under the administration of the Command on 18 May when it was due

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(1) These restrictions did not apply during special exercises or while squadrons were attending Armament Training stations. The 10 hour restriction was relaxed on 26 May 1939 and for the rest of the summer applied only to London and Stranraer flying boats.  
Ref: A.H.B./IHK/36/16(1) encl. 60.

to arrive off Calshot. Its peace function was to operate a nucleus headquarters and one flying boat squadron in Home Waters. It was also to be used as a mobile base during Fleet and other large scale exercises and as a temporary base for flying boats when engaged on armament training. No. 100 G.R. Wing began to form on 12 May 1939 on a nucleus establishment.

(d) Permanent Group H.Q.s and transfer of Auxiliary Squadrons

Although the headquarters of both No. 16 and No. 18 Groups moved back to Lee-on-Solent on the termination of the crisis, it was appreciated that they would need to return to their permanent stations as soon as was convenient. No. 18 Group Headquarters was transferred to Rosyth on 1 November 1938 and No. 16 Group Headquarters to Chatham on 8 November. The opportunity presented by these moves was taken to incorporate in the Command three of the four Auxiliary Air Force squadrons which were due for transfer from Bomber and Fighter Commands under Expansion Scheme L.<sup>(1)</sup> The first squadron to be transferred (No. 612 on Hectors) was placed in No. 18 Group on 1 November. This was followed on 7 November by No. 500 Squadron (on Hinds) which went to No. 16 Group. No. 502 Squadron (on Hinds) came to the Command on 28 November and, pending the formation of the Plymouth Group, was also placed in No. 18 Group. These three squadrons all came from No. 6 Group Bomber Command. The fourth squadron (No. 608) did not come from No. 12 Group Fighter Command until 20 March 1939 and went to No. 18 Group.

(e) - Concurrent mobilisation for Coastal Command and the Royal Navy

In his report on matters of major policy brought to light by the crisis, the A.O.C.-in-C. (Air Marshal Sir Frederick Bowhill) had noted "Difficulty was caused to Coastal Command, both in personnel and accommodation, owing to the fact that squadrons had to move to war stations under Emergency and not Mobilisation conditions. It is considered that orders given to the Coastal Command should strictly correspond with H.M. Navy as regards the degree of mobilisation to be put into force."

After repeated representations by him to the Air Ministry between January and March, measures to ensure this were taken on 25 May 1939 when, under the terms of an Order in Council, the Secretary of State for Air was empowered to call out for service all or any of the members of the Auxiliary Air Force or Air Force Reserve "if satisfied that their service is urgently required for ensuring preparedness for the defence of the realm against any external danger". Special entries were made in the

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(1) As a result of the Munich crisis, a new R.A.F. Expansion Scheme M had been authorised but as mentioned at the beginning of Section (viii) in footnote (1) this provided for no increase in the number of squadrons for Coastal Command. Attention was, therefore, concentrated upon bringing the Command up to its full establishment under Scheme L as quickly as possible.

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Mins. 29, 31  
and 32

A.M.  
S.46669  
encl. 11A

Government War Book and the Air Ministry War Book providing that, on naval mobilisation being ordered, mobilisation of the regular units and the Auxiliary Air Force units of Coastal Command should proceed concurrently.

(f) Agreement on a standard method of reporting positions at sea

Here the difficulty was to reconcile the divergent requirements of the Services and even those of the three R.A.F. Commands. The question of a standard method of reference had first been raised in January 1938. Suggestions were put forward by both Bomber and Fighter Commands but neither was entirely suitable for astronomical navigation. Eventually Coastal Command advocated a modification of the Fighter Command method. This was tried in the 1938 C.D.X. exercise and proved satisfactory. The Admiralty, however, were convinced that the current naval method of giving bearing and distance from lettered positions could not be dispensed with. Objections were raised that it was too slow and cumbersome for use in an operation room, that it was liable to inaccuracies, and that it was impossible to plot all the lettered positions on the small scale charts used by modern aircraft.

The need for early agreement on a standard method was stressed after the Munich crisis by the A.O.C.-in-C. Coastal Command and on 13 January 1939 a conference was held at the Air Ministry. All the Commands favoured a system based on the graticule, except Fighter Command which was tied to the grid system for Army Co-operation. The Admiralty put forward a scheme which employed lettered positions based on latitude parallels and longitude meridians each distinguished by two letters which were never repeated. The advantage was that it could be combined with the graticule system to give a four-letter four-figure reference which would be world wide in its application.<sup>(1)</sup> The conference decided that this combined system should be used by all R.A.F. Commands when co-operating with the Navy. This decision was confirmed by the Admiralty on 16 January and the Naval Staff undertook the compilation of the necessary Key

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(1) Each exact degree of latitude between 70°N and 70°S and each exact degree of longitude were allotted a pair of letters. The points of intersection would thus be defined by four letters, of which the first two were always to be the latitude. A precise position was always to be reported by the four letters giving an intersection nearest south and west of it. The number of minutes of latitude up to the precise position would be the first pair of figures and the number of minutes of longitude eastward to the precise position would be the second pair of figures. Example - supposing latitude 58°N was designated AB and longitude 3°E was CD, then the signalled report of an enemy ship in ABCD1535 would decode into 58° 15' N x 03° 35' E.

Lettered Tables. This standardised method of reporting positions for use by ships and aircraft was announced in an Air Ministry Confidential Order dated 6 March 1939. The Key Lettered co-ordinates for use in peace were issued as Admiralty S.P.02276 and the system was brought into force for all R.A.F. Commands at home and abroad on 1 May 1939.(1)

(g) - The final location of Coastal Command Headquarters

The Headquarters remained for some time still at Lee-on-Solent despite the difficulties of control experienced during the Munich crisis. A decision to move to the London area, in order that close touch could be maintained with the Admiralty, had been taken as early as July 1938 but proved difficult to implement. A suitable property in the built-up areas of suburban London was hard to find and though in September the eventual home of the Command had been discovered at Northwood there were disadvantages connected with it which made the Air Ministry hesitant about making a final decision.(2) Moreover, Sir Frederick Bowhill, when consulted about the transfer, proved reluctant to sacrifice the obvious peacetime advantages of remaining at Lee-on-Solent where he was in such close contact with the staffs of the C.-in-C. Home Fleet and the C.-in-C. Portsmouth.(3) However, the understanding with the Admiralty that Coastal Command H.Q. would move to N.W. London was reaffirmed in November and it was confirmed by the Air Ministry in December 1938 that the wartime need would take precedence over peacetime convenience. Treasury approval was given for the acquisition of Eastbury Park Hotel on 11 March 1939 and plans were made for the move of the headquarters in April.

The delays experienced in the formation of No. 15 Group Headquarters at Plymouth proved, nevertheless, decisive against the transference. Until No. 15 Group was in existence, considerations of operational control of the southwest squadrons made it imperative to retain the Command headquarters on the south coast. The negotiations with the War Office over the transfer of a suitable site at Mount Wise, Plymouth for the erection of permanent headquarters for No. 15 Group were protracted and it was not till 6 June that the staff moved in. The Group Headquarters started to function on the following day and a week later took over control.(4) The way was now open for the move of the Command Headquarters from Lee-on-Solent to Eastbury Park, Northwood which was effected on 7 August 1939 and where it has remained ever since.

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- (1) On the outbreak of war a fresh table of lettered co-ordinates was to be promulgated for use and changed periodically by the Admiralty for security reasons. Coastal Command adhered to this method of reporting positions throughout the Second World War.
  - (2) The property was the Eastbury Park Hotel just outside Northwood - Middlesex. It had recently been rather notorious as the "Chateau de Madrid". One of its disadvantages was held to be its distance from any airfield.
  - (3) Sir Frederick was also not anxious to resume the comparative isolation felt by the Coastal Area headquarters in former years when it had been established in Tavistock Place. Ref: A.M.S.46650 encl. 34A.
  - (4) The first A.O.C. was Air Commodore R. G. Parry, D.S.O.

A.M.C.O.  
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S.39593  
Minutes 52  
and 54

A.M.  
S.48120  
encl. 11

CHAPTER XII

THE LAST FEW MONTHS OF PEACE

(1) Development of detail in the A.C.H.Q. control

One of the modifications arising out of recent experience concerned the extent of the areas controlled by the respective Area Combined Headquarters. At an inter-service conference held on 5 December 1938 a plan was proposed by the C.-in-C. Home Fleet for unifying the control of the whole North Sea Reconnaissance under a single Headquarters at Rosyth. Although this had the advantage of making unnecessary a Headquarters at Chatham, which was considered highly vulnerable to enemy air attack, it would alter the whole of Coastal Command's plans for operational control and would also mean the assumption of responsibility by the Rosyth Naval Command for the protection of shipping in the North Sea, Straits of Dover and the eastern half of the Channel.<sup>(1)</sup> This rather sweeping proposal was considered to need further Departmental investigation. However, the conference was able to agree on a number of details concerning the composition and communications of the Area Combined Headquarters:-

A.M.  
S.39593  
encl. 73A

- (1) It was agreed in principle that the Navy and Air Force should be represented by officer and operational staffs with full executive authority whereas the Army was only to be represented by Liaison Officers from Army Commands or Areas.
- (2) Pitreavie Castle was agreed as the site for the permanent A.C.H.Q. at Rosyth. A temporary site was approved at Chatham and the conference ruled that negotiations must be expedited for the purchase of land and erection of a permanent Headquarters at Plymouth.
- (3) Communications were required from A.C.H.Q.'s to adjacent Area Headquarters, to the Admiralty, to Coastal Command H.Q., to local Army Commands, to independent fortresses (such as Portsmouth), and to Defended Ports as well as to their own internal Air Units.
- (4) Finally it was ruled that the above arrangements should be completed to enable the scheme to function, on at least a temporary basis, by 1 April 1939.

The suggested abolition of the Chatham A.C.H.Q. was rejected on 5 January 1939 on the ground that only two headquarters would be insufficient to control the reconnaissance and trade protection operations for the whole of the British Isles. The local Naval Commands were again revised by the Admiralty, the main changes being the re-institution of the Portsmouth Command and the formation of a new Command taking in the Orkneys and Shetlands.

A.M.  
S.45085  
encl. 54A

The net result of these discussions and decisions was that, by 25 January, the limits of the Air Group areas were

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- (1) A recent plan for the unification of operational control over the western shipping had resulted in the absorption of the Portsmouth Naval Command into that of Plymouth.

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ibid  
encl. 64A

redrawn to correspond as closely as possible with the new Naval Commands. No. 15 Group boundary now ran from the meridian of 3° West in the English Channel, westabout to the Southernmost point of the Mull of Kintyre, thence along a line drawn north-westwards to position 57°00'N x 10°00'W and then due west along the parallel of 57°N. No. 18 Group boundary started in the west from the northern limits of No. 15 Group, and extended north-about, taking in the Orkneys and Shetlands, to a line drawn across the North Sea from Flamborough Head to the Horn Reef's light vessel. No. 16 Group area was the whole of the North Sea south of this line and the English Channel as far west as the meridian of 3°W. (Map No. 2 illustrates these Group boundaries and the local Naval Command limits).

No special provision was considered necessary for specific air units to co-operate with the Naval C.-in-C. Portsmouth but it was decided that, on the outbreak of war, three Air Force liaison officers should be attached to his headquarters. This staff would form the nucleus of a Wing Headquarters if it proved to be indispensable.

(ii) The final touches given to Coastal Command's War Plan

At the end of December 1938 instructions for the employment of Coastal Command aircraft if war should come during Phase VI of the Western Plan (October 1938 to April 1939) were circulated to all Groups, the Admiralty and local Naval C.s-in-C. The following is a description of the air patrols:-

A.H.B.  
IHK/54/10/11  
encl. 14A

(a) North Sea Reconnaissance

The majority of the squadrons were to be concentrated in the northeast in order to detect German warship commerce raiders attempting to break out on to the Atlantic trade routes.

From Montrose to the nearest point on the Norwegian coast a continuous blocking patrol was to be flown during the hours of daylight in the form of an endless chain. Aircraft were to take off at intervals of 45 minutes and follow each other round. This patrol was entrusted to No. 233 G.R. Squadron equipped with Ansons. Owing to the limited range of these aircraft, a gap of 60 miles was left between the end of the patrol line and the Norwegian coast. Until this stretch could be covered by the re-equipment of the Squadron to longer ranged aircraft the gap was to be filled by reconnaissance submarines. For the purpose of this patrol, visibility was assessed at 10 miles and deficiencies due to reduced visibility were accepted owing to the second chance of sighting when the aircraft were on the return track.

ibid

To provide against the possibility of an escaping raider passing undetected through the area of the continuous patrol during darkness, two series of parallel track searches were planned to the north and south of it. To cover the area to the north as far as a line drawn from the Shetlands to Stadtlandet in Norway, a daily series of dawn searches was to be carried out by Nos. 201, 209, and 228 flying boat squadrons stationed at Invergordon. (1)

(1) These squadrons were also to co-operate as required with the Northern Blockade Patrol of surface vessels engaged on contraband control.

(91320)244

SECRET

ibid

The tracks of these aircraft were to be 20 miles apart. The area south of the continuous line patrol down to the latitude of Thornaby was to be searched every evening at dusk by Anson aircraft from No. 224 Squadron at Leuchars and No. 269 Squadron at Thornaby. Again a gap was left, owing to the short range of the Ansons, between the ends of these patrols and the coast of Denmark. Over this gap parallel track searches from north to south were to be flown by flying boats from No. 210 Squadron operating from Woodhaven. On these southern patrols the Ansons tracks were to be 15 and those of the flying boats 20 miles apart.

This system of patrols had been based on the calculation that a German raider which entered the area of the southern patrols after dusk would not be able, during the hours of darkness, to steam sufficiently far to the north to evade the northern parallel track dawn searches on the following day.<sup>(1)</sup> Darkness, however, was not the only difficulty in maintaining effective air reconnaissance - there was also the problem of bad weather. For the occasion when it was not possible to operate these routine patrols and searches, a system of alternative patrols was devised. As soon as the weather permitted, the flying boats which were normally used on the North Sea searches were to carry out a parallel track search extending roughly 240 miles northwest from a datum line drawn between the Orkneys and South Uist in the Hebrides. This would give a chance of sighting enemy vessels which had slipped out of the North Sea during a period of bad weather.

(b) Anti-submarine Co-operation

ibid

Aircraft were required, in the period before the introduction of convoy, to co-operate with naval anti-submarine units in five of the nineteen areas which had been specified by the Admiralty.<sup>(2)</sup> Aircraft from No. 224 (Anson) Sqdn. were to be responsible for the Forth area, No. 220 (Anson) Sqdn. for the whole of the Thames estuary, No. 217 (Anson) Sqdn. for the Start and Bristol Channel areas, and No. 204 (flying boats) for the Lizard area. One other area, around the Orkneys, was to be covered by Fleet Air Arm aircraft.

(c) Convoy escorts

ibid

If the convoy system was introduced, in response to the development of unrestricted submarine warfare, aircraft would be required to escort each convoy during daylight hours. Aircraft for this duty were to be provided by Ansons from No. 224 (at Leuchars), No. 269 (at Thornaby), No. 220 (at Bircham Newton), No. 48 (at Thorney Island) and flying boats of No. 204 Sqdn. (at Mount Batten). The two Auxiliary Air Force Squadrons,

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- (1) As the hours of darkness were longer in winter than in summer the extent of the area covered by these searches was to be increased during the winter months.
  - (2) At this date, it was not anticipated that co-operation with all the nineteen hunting groups would be possible until the Command had attained its full expansion under Scheme L.

Nos. 500 and 502, which had recently been transferred (in November) to the Command were also to be employed on convoy escort work in the vicinity of their war stations but were only to be used for anti-submarine co-operation after being re-equipped and properly trained.

(d) Co-operation with the Dover Barrage minelayers

It had recently been requested by the Admiralty that air cover against surprise enemy attacks should be provided for the minelayers who would be detailed on the outbreak of war to lay the Dover Mine Barrage. One aircraft daily was to be provided for this task from No. 500 (Auxiliary) Sqdn. at Detling.

(e) An Air Striking force (1)

The only squadron available for this duty was No. 42 Vildebeest torpedo-bomber squadron stationed at Thornaby. The other torpedo bomber squadron (No. 22) was carrying out intensive flying trials with the new Beaufort torpedo-bomber before they were put into service and the squadron was held in reserve at Thorney Island.

At the end of Phase VI the above instructions were re-issued with minor modifications on 31 March 1939 and came into force for Phase VII (April to September 1939). On 30 June the Command Headquarters issued the final version of its war plans, covering the latter half of Phase VII from 1 July to 30 September 1939. In this document was re-affirmed the Role of Coastal Command as follows:-

1. To assist the Home Fleet in the detection and prevention of enemy vessels escaping from the North Sea to the Atlantic.
2. The provision of air patrols in co-operation with the anti-submarine surface craft,

or

Air escort to convoys within range.

3. Air searches, when required, over home waters.
4. The provision of an air striking force for duty mainly on the East Coast.

There followed the statement that the A.O.C.-in-C. Coastal Command might order re-adjustment of the forces at his disposal to meet circumstances which required concentration of effort on any one or more of these functions. For this reason the plan outlined must be considered as flexible and subject to amendment to meet existing conditions.

Substantially the arrangements for the various types of naval co-operation as already mentioned remained unchanged. Some of the modifications may, however, be given. For example,

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- (1) The virtual absence of any strike force caused some consideration to be given to the provision of one from Bomber Command resources but as explained in Section (vi) the proposed action never materialised.

ibid

A.H.B.  
IHK/54/2/14

ibid

See Map 3

the North Sea tracks to the north and south of the continuous line patrol were lettered for ease of reference; the alternative patrols to be flown by flying boats in the case of bad weather in the North Sea were changed to a divergent sweep and parallel track searches extending northwestward from the Orkneys and Shetlands respectively; in the case of convoy being instituted the existing strength of the squadrons detailed for air escort limited such escort to one aircraft during the hours of daylight for homeward bound convoys only; and finally some of the squadron war dispositions were changed. No. 210 Sunderland Sqdn. was moved from Woodhaven to Pembroke Dock so as to assist No. 204 Sqdn. in the extensive and very important Southwest Approach for shipping and No. 228 Sunderland Sqdn. had just been detached to the Mediterranean as a reinforcement to that area following a Chiefs of Staff requirement. So that not only had the north/south searches off the coast of Denmark to be cancelled but there was a weakening in the northern part of the North Sea reconnaissance. This was partially compensated by stationing No. 201 Sqdn. in the Shetlands based on S.S. Manela as depot ship. Certain other minor moves were planned and Map No. 3 shows the war stations of all squadrons and the extent of the air patrols.

ibid

(iii) Re-equipment of Coastal Squadrons in 1938/1939

100th Expansion  
Progress Meeting  
30.11.37

106th Expansion  
Progress meeting  
21.12.37

At the time of the Munich crisis all seven of the regular G.R. land-plane squadrons had been equipped with Ansons. This aircraft had fairly good navigational qualities but had a limited range and a very small bomb load.<sup>(1)</sup> Even as early as November 1937 the Air Council had agreed that the replacement of this type was a matter of urgency and the C.A.S. had given it as his opinion that it was useless except as a trainer. The Air Staff requirement for an improved type was that it should be capable of being used as a bomber or alternatively be able to carry a torpedo, that it should have good navigational qualities and good armament but not necessarily a very high speed or general performance. To meet these requirements the Air Ministry had planned the production of two new types - the Beaufort and the Botha. The prototypes of these aircraft were, however, not expected to be available before August or September of 1938. It had, therefore, been necessary to provide a stop-gap G.R. type to replace the Anson. This was to be the Bolingbroke but as this aircraft was found to have certain navigational defects and as its manufacture would have delayed that of the Beaufort, the Air Council decided in December 1937 that it should be eliminated from the production programme.

Since no other stop-gap G.R. type could be found in the British market, the Air Staff investigated the possibility of purchasing a certain number of aircraft from the United States. After the German occupation of Austria in March 1938, a confidential cable was sent to the British Air Attaché in Washington asking whether, in his opinion, there were any American types of service aircraft which were likely to be of

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(1) The performance figures for the Anson in 1939 were as follows:-  
Effective radius of action - 256 n.miles. Cruising speed at 2,000 feet 114 knots. Endurance - 4½ hours.  
Bombload - 2 x 100 lb. bombs.

118th Expansion  
Progress Meeting  
22.3.38

use to use and, if so, what were the prospects of reasonably early deliveries. Group Captain Pirie, in his reply, drew attention to a military aircraft known as the D.B.18 (a converted Douglas civil air liner) which had the required G.R. characteristics. Meanwhile the C.A.S. had become interested in the military version of the Lockheed B.14 whose estimated performance appeared somewhat superior to the D.B.18. When consulted on this alternative possibility, the Air Attaché suggested that an official mission should be sent to the United States to report on the Lockheed, as there were conflicting reports on its flying characteristics and its armament was said to be indifferent. Accordingly a technical mission led by Air Commodore Weir and consisting of Messrs. Self, Brand and Engelbach, with Air Commodore A. T. Harris as adviser, was sent to investigate.

128th Expansion  
Progress Meeting  
28.6.38

After visiting the Lockheed Company's plant at Burbank in California the mission reported favourably on the B.14 and an order for 200 was placed, the contract being signed in June. In October a further 50 were ordered. The first batch to be delivered in this country arrived in February 1939 and on 25 May the aircraft was officially registered as the Hudson I. The great advantage of the Hudson was that its effective radius of action was nearly double that of the Anson and its bomb carrying capacity five times as great. It also had increased speed and endurance.(1)

A.M.  
S.46154 Part I  
encl. 1A

The original decision taken in regard to the re-equipment of the regular G.R. squadrons was that six should be re-armed with Hudsons on the Scheme L establishment of 21 I.E. and 7 I.R. This meant that of the 200 aircraft on order, 32 would be set aside for peace wastage, the war wastage being provided by rolling up squadrons when Beaufort and Botha aircraft became available in sufficient numbers. The remaining G.R. squadron was to be the first to re-arm with Beauforts.

ibid  
encls. 5A and  
9A

The priority for re-equipment was determined by the A.O.C.-in-C. and Air Ministry at the height of the Munich crisis. Nos. 224, 233, and 269 Sqdns., who were responsible for carrying out the most vital of the North Sea reconnaissance patrols, were to be re-equipped first. Nos. 206 and 220 Sqdns. were to follow, as they also would be required to work over the North Sea in the ultimate plan. The last squadron to be re-equipped was to be No. 217 which had been assigned to convoy escort duties in the Western Channel. The Anson aircraft released in this way were to be used to re-arm the four Auxiliary Air Force Squadrons (No. 500, 502, 608 and 612).

At the end of February 1939 the above policy was reviewed and the following changes were made in March/April:-

1. Five (instead of six) of the regular G.R. squadrons were to be re-armed on Hudsons on the basis of 18 I.E. plus 6 I.R. As 250 Hudsons were now on order, this change allowed the squadrons their full reserves and provided for wastage.

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(1) The performance figures for the Hudson I were as follows:-  
Effective radius of action - 495 n.miles. Cruising speed at 2,000 feet - 165 knots. Endurance - 6 hours.  
Bombload - 10 x 100 lb. or 4 x 250 lb. bombs.

2. The two torpedo-bomber squadrons (Vildebeest IV) were to receive the first Bothas on an establishment of 14 plus 5.
3. The two remaining G.R. squadrons were to be re-armed on Bothas immediately after the torpedo-bomber squadrons.

ibid  
encls. 12A  
and 16A

The ultimate intention was to re-equip all regular squadrons of Coastal Command with Botha aircraft, of which 486 were on order. The first of these aircraft were expected to be delivered in September 1939.

Very little of this programme had, however, been carried out by the time war broke out. Only one of the three regular G.R. Anson Squadrons which were supposed to complete their re-armament to Hudsons by the end of August had actually done so. This was No. 224 Sqdn.(1) Of the four Auxiliary Air Force squadrons, three had only completely re-equipped to Ansons in July 1939 and the only mobilisable torpedo-bomber squadron (No. 42) was still equipped with the semi-obsolete Vildebeest IV aircraft.(2)

The position of the flying boat squadrons at the end of August 1939 was even worse than that of the landplane units. At home there were only two squadrons (Nos. 210 and 204) equipped with a modern type in the shape of Sunderland I.s and of these No. 204 had only completed its re-equipment in July.(3) The most serious aspect of the situation was the failure of the new Lerwick flying boat with which Nos. 201, 209 and 240 Sqdns. were due to re-equip. A set-back in the production of the Lerwick had been experienced the effect of which was that the first boats of this twin-engined type which should have been delivered in December 1938 did not become available till six months later. Early in August the Lerwick was found to be a complete failure and it became obvious that orders for this flying boat would have to be cancelled. This action was taken shortly after the war broke out and the result was that three of the five flying boat squadrons in the Command were likely to remain for some time equipped with the semi-obsolete Londons and Stranraers of low performance. A further difficulty, which was to cause the A.O.C.-in-C. considerable anxiety, was that the number of the these older types was limited and that they were fitted with the Pegasus X engines of which there was still a shortage. Maintenance problems were therefore bound to be acute and this raised the question of how long these three squadrons would remain capable of fulfilling the operational tasks allotted to them. Ultimately, in 1940, it became necessary once again to have recourse to American construction and 30 Catalina flying boats were ordered from the United States. The final blow to these re-equipment plans also came in 1940 when the Botha proved useless on account of its inability to fly on one engine under operational conditions.

A.M.  
S.41558 Part I  
encl. 35A

179th Expansion  
Progress Meeting  
4.8.39

A.M.  
S.41558 Part I  
encl. 112A

See R.A.F. in  
Maritime War  
Vol. II Chap.II  
(vi)

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- (1) No. 233 Sqdn. was not completely operational on Hudsons until 2 October and No. 220 Sqdn. not till 8 November 1939.
  - (2) The performance figure for the Vildebeest IV were as follows:- Effective radius of action - 185 n.miles. Cruising speed - 82 knots. Endurance - 4.3 hours. Bomb load - one 18 inch torpedo or 8 x 100 lb. bomb.
  - (3) No. 228 Sqdn. which had re-armed to Sunderlands in March 1939, had been detached in June to Malta under the Mediterranean Air Command.

(iv) Anti-Submarine Policy and Training

(a) Policy

To carry this subject forward from 1934 where it was left in Chapter VI (vii) it is only necessary to say that three years later, in March 1937, the Naval Staff submitted a memorandum to the Committee of Imperial Defence on defence against submarine attack in which the major part was once more given to the ASDIC equipped surface craft. Aircraft were mentioned only in general terms as being necessary if the anti-submarine effort was to be developed with the maximum efficiency which referred to their use in the spotting and reporting role. In this, it was stated, they had a very great potential value if their personnel were fully trained and conversant with the various aspects of A/S warfare but this value would be largely discounted unless in peacetime a nucleus was built up of trained personnel in suitable aircraft, and in this respect there was much to be done before a desirable state of affairs was achieved. The duties were still held to be the maintenance of inner and outer patrols around the Battle Fleet or the merchant convoy so as to give warning to the surface escort who would take the necessary attack action. Later in the year this passive role was upheld in Joint Staff Paper (C.O.S.640) on the Protection of Seaborne Trade which was approved by the Committee of Imperial Defence on 26 November 1937.

C.I.D.  
1318.B

A.H.B.  
IHK/54/3/269A  
encl.1B

C.I.D.  
1368 B

In June 1938 the Naval Staff produced a memorandum on the function and duties of Anti-Submarine Striking Forces. Most of this was devoted to the tactics of location and subsequent hunt of the submarine by ASDIC fitted surfaces. Aircraft were only mentioned as being required to provide look-out patrols to ensure detection of submarines at from six to ten miles from the surface group of A/S vessels. Regarding the possibilities of aircraft attack, it was said, the chances of sighting a submarine at periscope depth in waters around the British Isles were very small but under favourable weather conditions an aircraft had a considerable chance of bringing off an effective bombing attack on a surfaced submarine. In this respect the type of aircraft of most use would be of small or medium size. Large flying boats, due to their unhandiness, were less suitable either for location or attack and, on account of their size, would often be sighted by the submarine in time to submerge unseen. Diagrams were given which showed various forms of air patrols considered desirable when co-operating with a surface hunting group.

A.H.B.  
IHK/54/3/269A  
encls. 22A, B,  
and C

This memorandum was sent to the Air Ministry on 27 July and by them to Coastal Command on 5 August 1938. In view of the fact that No. 217 Anson Sqdn. had been allocated since the previous January to work with the A/S School at Portland on this subject, the Command sent the memorandum to No. 16 Group saying that comments by the C.O. of the squadron were required. On 16 December 1938 the C.O. reported that in many ways the exercises carried out in collaboration with the Commanding Officer of the A/S School had not been on the lines laid down in the Memorandum. Furthermore, the experience gained in these exercises was at variance with certain of the assumptions made in it. He listed the points of difference and ended with the observation that the Memorandum underestimated the power of a fast aircraft to itself carry out an effective attack on a submarine sighted on the surface or in the act of diving.

ibid  
encls. 24A, 29A  
31A and 33A

ibid

Encl. 4OB

As an accompaniment to their memorandum on Anti-submarine Striking Forces, the Admiralty issued a letter on 23 February 1939 restating the principles of Anti-Submarine Patrol which governed the use of aircraft in connection with the defence of a fleet or convoy. This followed the same lines as heretofore of Inner and Outer air escort patrols with the emphasis on the reporting of submarines sighted as opposed to action in attack. It was considered that the Outer Patrol was generally likely to be the more valuable. The most efficient method was held to be a cross-sector patrol across the mean line of advance of the Fleet at visibility distance from the advanced surface units. In the case of a merchant convoy the patrol should be at two hours steaming distance ahead of the convoy and periodically the aircraft should return to sight the convoy. An occasional search to the rear of a slow-moving convoy should be carried out, especially at dusk and dawn, to frustrate a shadowing submarine or one who was trying to get ahead on the surface in readiness for a submerged attack. If Inner Patrols were used, they should be between three and four miles ahead of the Fleet or convoy.

ibid

encl. 42A

This letter was circulated by Headquarters Coastal Command to all Groups as indicating the accepted escort doctrine and remained in force well into the Second World War. It can be seen therefore that the tactical use of aircraft in an anti-submarine role whether employed as escort to a fleet or convoy or in independent operations was envisaged, in the Admiralty view, almost entirely as reconnaissance. Such tactics had been taught and tried out in the occasional Fleet Exercises over the past nine years and, up to the end of 1937, in the co-operation exercises with the A/S School at Portland.

(b) The development of methods of actual air attack

A.H.B.  
IHK/54/3/166B  
encls. 1C and  
2B

In December 1937 it had been decided at H.Q. Coastal Command to allocate a squadron for permanent co-operation with the A/S School at Portland, not only for continuity of experience but to train pilots for other G.R. squadrons in this type of duty. No. 217 Anson Sqdn. at Warmwell was selected. By the end of 1938 there was a growing interest at Coastal Command Headquarters in the possibilities of successful independent air attack on submarines. This derived mainly from the report, already alluded to, by the C.O. of the Squadron. It was followed up enthusiastically by the A.O.C.-in-C., early in 1939.

There was, however, little positive information regarding the effects of bombs against submarines. There had been a series of actual bomb dropping trials carried out in 1920 and 1921 against ex-German submarines but the results were of little value now as the 1939 German U-boat was of far stouter construction. No further tests of any useful kind had been undertaken until 1938 when trials had taken place under the auspices of H.M.S. Vernon, the Naval Torpedo and Mining Establishment at Portsmouth. These were against a full scale target section of a modern British submarine. Explosive charges of various weights were fired electrically at approximately the same depth as the target section and at varying horizontal distances from it.

A.H.B.  
IHK/54/3/232A  
encl. 19A

Early in February 1939, Coastal Command enquired of H.M.S. Vernon as to the probable effect of modern bombs on modern submarines and giving sizes available to the Command

as 100 lb., 250 lb., and 500 lb. in which the explosive was roughly half the actual weight of the bomb. The Vernon replied giving tabulated information but this referred almost exclusively to the naval depth charge carrying 300 lbs. of explosive. Accordingly the A.O.C.-in-C. wrote to the Air Ministry on 23 February suggesting that, as the question of A/S bomb equipment was urgent, the Vernon might be asked to undertake trials with the existing type of bombs. Although some months later these were approved in principle, it was stated that it would be a considerable time before they could take place. They never did.

ibid  
encl. 20A

ibid  
encls. 18A and  
21A

Methods of attack now for the first time received serious attention. It was considered that a beam approach was best and for a stick of bombs spaced at 20 to 25 feet to be released from 500 feet altitude. Unfortunately there was no mechanical bomb distributor available and in March 1939 the Groups were asked to investigate the possibility of releasing sticks by hand. In the absence of practical trials, further enquiry on the capabilities of bombs produced theoretical data suggesting that a 500 lb. bomb must explode within 20 feet of a submarine to ensure destruction, and within 10 feet for a 250 lb. bomb. No distance was given for a 100 lb. bomb(1) but a direct hit with this or any of greater size was categorically stated to be lethal to any submarine. From this it was reasoned that once the submarine was well under the chances of a lethal attack by delayed fuze setting were not very good and therefore all attacks should be made with the object of obtaining a direct hit. Because a submarine was a small and fleeting target an aircraft could expect to deliver only one attack so that sufficient bombs must be released to give the greatest possibility of a hit. It followed that the 100 lb. bomb (of which more could be carried) should be the standard anti-submarine weapon.(2)

ibid  
encl. 23A

ibid  
encl. 35A

ibid  
encl. 43B

An official "Notes on Anti-Submarine Bombing" embodying these conditions was issued to all units in the Command on 1 July 1939 and the relevant sections in C.D.118 were amended at the end of the month. The Command thus went into the Second World War after less than eight months consideration of this important subject and tied to stick bombing with no mechanical distributor using in preference a light weight untested bomb with an unreliable fuze (see Appendix VIII). Moreover, in the short time available little or no practice in the attack method had been given to any of the squadrons. Small wonder was it that the first U-boat kill by the Command did not occur until 1941 and then not with a 100 lb. bomb.

See R.A.F. in  
Maritime War  
Vol. II Chap. II  
(vii)

(v) Air action against merchant shipping

The question of air action against merchant shipping had been argued over and debated for many years. The subject appears to have first arisen at the time of the 1922 Washington

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- (1) Later, on 28 July 1939, theoretical calculation gave this distance as 2 feet for a 100 lb. bomb, 6 feet for a 250 lb., and 11 feet for a 500 lb. A/S bomb. As mentioned earlier the proper practical trials did not eventuate. Ref: ibid encl. 63A.
  - (2) An exception was made for the flying boats who only had a fixed number of bomb hooks and could therefore carry no more 100 lb. than 250 lb. bombs in the total load.

C.I.D.  
352-B  
Page 4  
ibid  
Page 1

Naval Treaty when the delegation from the Air Ministry proposed that aircraft should be accorded the same rights of visit, search and capture of merchantmen as surface craft. The Admiralty opposed this view and urged that aircraft should be prohibited from all forms of attack on merchant shipping. Not feeling very strongly on the point at that time the Air Ministry agreed to this recommendation and it was endorsed by the C.I.D. Sub-Committee in Paper No. 359-B. Almost immediately afterwards the Naval Staff reversed their opinion and pressed for the adoption of freedom of air action subject to conformation to the laws of war as for submarines. As this was the time of preliminary meetings at the Hague to codify the Rules of Air Warfare, our delegates were instructed along the lines of the Naval Staff's proposal. On 22 January 1923 the Admiralty again changed their minds and requested the Foreign Office to re-instruct the delegates at the Hague that air operations against merchant vessels at sea should be prohibited. Yet again, on 5 February 1923, the Admiralty reversed their views and cancelled their previous letter to the Foreign Office. After discussion in the Committee of Imperial Defence, the Prime Minister ruled that the original instructions to our delegates at the Hague should stand.

C.I.D.  
391-B

C.I.D.  
397-B

During 1923 the Commission of Jurists drew up the Draft of the Hague Rules of Air Warfare but after long discussion came to no agreement on the specific question of air action against merchant vessels. Accordingly the Air Staff in conjunction with the Naval Staff considered what instructions were to be given to Air Commanders in regard to operations against seaborne commerce. Before any joint policy had been agreed, another Sub-Committee of the C.I.D. was set up in March 1924 to examine the reports of the Hague Commission of Jurists. On the question of merchant ships, the Sub-Committee recommended that at any future international conference the Government should press for recognition of the right of visit and search by aircraft which should conform in all respects to the rules binding surface craft but that aircraft should not be allowed to divert or attack merchant vessels. They added that as these rules would be broken by an unscrupulous enemy we must not neglect to protect our own shipping against the threat of air attack. The recommendation was approved by the Committee of Imperial Defence at their 183rd Meeting. There for the moment the question was left unanswered in any detail and with only a nebulous policy.

C.I.D.  
418-B  
pp.47 and 48

It was not until 1931 that the subject re-appeared. In October of that year the Admiralty raised the question in connection with the forthcoming Disarmament Conference and recommended that aircraft should be allowed to visit, search, divert or attack merchant vessels but subject to the rules governing submarines as agreed in the 1930 London Naval Treaty. The Chief of the Air Staff was not in favour of negotiated international undertakings. There were, he said, broadly two possible policies.-

C.O.S.282

- (a) To sink at sight regardless of the fate of crews or passengers.
- (b) Diversion, under which ships could be ordered into port.

Probably it might be possible to obtain agreement against (a) but what was to happen in case (b) if shipping refused to stop

A.H.B.  
IIA/1/34  
Encl. 112

or refused to go towards the designated port? How could a pilot be instructed on a course of action against single ships or against convoys and still satisfy the rules governing surface craft or submarines? He said that historically a nation which hoped to secure victory by effective action against sea-borne trade could always find some pretext for ruthless action. He suggested therefore that if rules were to be discussed, the only ones likely to afford general security were those which prohibited all forms of air attack on merchant ships at sea. But he considered it would be impossible to obtain international agreement to these and he doubted if much reliance could ever be placed on written undertakings of the kind proposed.

However, mindful of the unique position of this country completely dependent on seaborne supplies and trade, the Government did their utmost in the subsequent Disarmament Conferences to outlaw all forms of air attack on merchant ships, but without success. This and other measures to regularise air warfare came to naught a few years later when the Conferences finally broke down in face of the undisguised opposition shown by Germany and Japan.

C.O.S. 915  
Annex I

Later still, during April 1939, our general policy in respect of air bombardment was agreed with France in a series of Staff Conversations in London. In accordance with this policy, which was that of only attacking purely military objectives, both the Admiralty and Air Ministry issued instructions at the end of August 1939 concerning the action which could legitimately be taken in war against enemy shipping at sea. The instructions to aircraft clearly stated that the only forms of shipping at sea which could be attacked from the air without warning were enemy warships, troopships and auxiliaries in direct attendance on the enemy fleet, provided that these targets had been previously identified beyond doubt. The only action which was to be taken against merchant vessels was that the aircraft should, if possible, identify them, shadow them and report their movements to our naval units or to a shore base. Even if merchant vessels should open fire with defensive armament, aircraft were ordered to refrain from retaliation. As the subject of commerce raiders was uppermost in everyone's mind, there followed a most complicated procedure to be followed by aircraft dealing with a suspected disguised merchant raider in which only a minimum of force was to be employed after ample warning signals had all been disregarded by the suspect.

C.O.S. 961

A.M.  
Signal X.476  
27.8.39

See R.A.F. in  
Maritime War  
Vol. II Chap.I  
(iv)

Coastal Command thus entered the Second World War prohibited from attacking enemy merchant vessels and hamstrung in any attempts to stop disguised armed merchant ship raiders.

(vi) Bomber Command's role in Maritime War

(a) The write-down in their major role

We have seen in Chapter XI (ii) that by October 1937 a nominal list of objectives had been drawn up for the R.A.F. Bomber Force in a war with Germany. Most of these were to be carried out as the means of countering the expected German air offensive against this country. During subsequent months a more detailed consideration of these plans revealed that the numbers, range and bomb load capacity of the bomber force were insufficient to hold out any chance of success in prosecuting W.A.1 (attacks on the German Air Force) or W.A.4 (attacks on the German Army). Plans W.A.5, 6 and 8 (attacks on German Industry)

A.M.  
S.42728  
and  
S.42731  
encl. 35A

were all long term projects whose effects might not be felt for months. Bombing therefore was no answer to any immediate German attack. This unpalatable conclusion was re-enforced in the Spring of 1938 by the realisation that the country's aircraft industry was unequal to the demands being made upon it and that even the accelerated Expansion Scheme L would leave the bomber force at least two years behind the German potential strike force in 1939 and furthermore that this inferior force would be incapable of a sustained effort by reason of an insufficient backing.

A.M.  
S.41432  
encl. 53A

The previous concept of the bomber force acting either as a deterrent or a direct countermeasure to an all-out German air attack had to be abandoned and the policy adopted that we must depend on the Fighter force for countering the enemy air threat. Fortunately the advances made by this time in R.D.F. location and the existence in growing numbers of the fast eight-gun fighter aircraft with two-way R/T communication rendered this complete change of strategy more hopeful of success than had seemed possible in 1936 when the Bomber Offensive policy was the chosen countermeasure.

The Munich crisis of September 1938 confirmed this change of air policy besides further constricting the employment of bombing, for it was concluded that instead of an immediate German air onslaught on the United Kingdom there was a probability that the German Army and Air Force would first be occupied in Central or even Eastern Europe and for a time the enemy would be only on the defensive in the West. If so, the "gloves might not be off" for bombing attacks and it would be foolish with our weaker force to be the first to take them off. Planned bombing should be severely restricted to purely military targets with no risk to civilian life and the bomber force, particularly the trained personnel, must be conserved against the time the force could be built up with modern long range heavy aircraft. Meanwhile, although every effort was to be made to increase the strength of all Commands, the claims of Fighter Command must have priority where interests conflicted.

A.M.  
Conference  
18.10.38

Further consideration of the W.A. plans resulted in the virtual abandonment for the time being of W.A.1, 4, 5, 6, 8 and 13. There was thus no plan which offered a solution to the problem of how to employ the existing bomber force effectively in the restricted period. Indeed their limitations were in themselves a challenge to a policy of restricted bombing. Ultimately, however, another way was found. This was a plan (W.A.14) for dropping propaganda leaflets from the air. The course of the development of this plan is fully described in R.A.F. Bomber Command Volume I; suffice to say here that it originated in September 1938, received Ministerial approval in April 1939 and was ready for implementation in May. As is well known the plan was started at the outset of war and the sorties received the code name of "Nickel raids".

A.M.  
S.46368  
encls. 10A  
and 11A

A.M.  
S.46650/1

(b) The Ultimate extent of Bomber Command's participation

Among the few W.A. plans which could qualify under the restricted policy were those with a maritime objective. W.A.2, 3 and 13 were the concern of Coastal Command. The others were, on examination, found difficult to implement. W.A.10 (attacks on merchant shipping in port, especially the Baltic) involved civilian targets and in any case the Baltic

was out of range for all but a very few of the newer heavy bombers; W.A.7 (attacks on naval bases) was possible only in the case of Wilhelmshaven but very accurate bombing would be required to avoid civilian casualties, bomber crews had not been trained in ship recognition and 1,000 lb. bombs would be needed of which as yet there were none in existence; W.A.9 (attack on the Kiel Canal locks) would also require the 1,000 lb. bomb and the locks were small difficult targets.

At the end of 1938 a modification of W.A.7 was adopted for a bombing attack on the warships lying in Wilhelmshaven and the offshore Schillig Roads. A detailed plan was prepared under the heading of W.A.7A and a copy sent to the C.-in-C. Bomber Command on 27 January 1939. His reactions were not favourable and he pointed out that to achieve surprise at dawn would require extreme accuracy of navigation at night over the sea with no previous landfall. The alternative was a daylight approach which he thought impracticable in face of the powerful defence available to such a major naval base. However, the project was considered desirable, not so much for inflicting damage on the warships, as to force the German Fleet to sea where naval forces would be in readiness to engage.

This aspect was the subject of a conference on 30 March 1939 between the C.-in-C. Bomber Command and the C.-in-C. Home Fleet. Both Commanders finally agreed that it was unlikely that the German Fleet would put out into the open sea as a result of air attack but the C.-in-C. Home Fleet said he could have naval forces in readiness about 100 miles N.W. of Heligoland. A few days later on 3 April, the C-in-C. Bomber Command expressed doubts as to whether his aircraft could hit the German warships, especially as the majority might be underway by the time the aircraft got over them. He explained that Bomber Command had little experience of bombing ships on the move and that only six of the twenty odd squadrons which would be used on this project were even then undergoing any training in this type of bombing. Nevertheless these doubts and difficulties were cast aside by the Air Staff and the plan, though modified, was continued.

On 25 May 1939 an exercise was carried out to test the feasibility of the plan. The object was to investigate the problem of concentrating a large bomber force in quick succession over the target after a long sea flight and without a preliminary landfall having been made, and also to indicate to the Royal Navy the type of attack with which they might be confronted in war. The Fleet was lying at Portland. Out of the total of 117 aircraft briefed for the attack, 92 actually reached the target and "bombed". Weather conditions on the route and in some cases at the bases, were unfavourable and the navigation proved to be difficult. Track keeping was, however, said to have been good, despite the fact that some of the bombers made unauthorised departures from the track and in a few cases made landfalls before reaching the target. This would of course have compromised the surprise of the attack in war. Various tactics were employed. No. 3 Group employed pattern bombing, the plan being for each squadron to cover 500 yards and the "bombs" were dropped on a signal from the leader of each formation, which attacked in line astern. No. 2 Group was briefed to make individual attacks and each aircraft was to select a battleship as its target. No. 5 Group was to attack in formations of squadrons, each squadron

A.M.  
S.50128  
encls. 1A  
and 4A

ibid  
encls. 5B, 9A  
and 15A

ibid  
encl. 19B

ibid  
encl. 19A

acting independently. It was estimated that H.M.S. Rodney and Royal Sovereign received direct hits, and that hits were also obtained on the three land targets representing ships in a dockyard.(1)

A.H.B.  
IIA/1/7

On 1 July 1939 the final plan was issued as an Air Staff Appreciation. In it the Air Aim was stated to be to cause the maximum damage to warships lying in the harbour or roads of Wilhelmshaven and the Naval Aim was to bring to action any German ships putting to sea. The maximum bomber force available would be 10 medium and 11 heavy squadrons. There followed details of the enemy defences, the ships expected to be in Wilhelmshaven and the calculated chances of hitting the targets. As the heaviest weapon was the 500 lb. bomb no total destruction of any warship was likely but it was felt that damage might "interfere seriously with the operation of the German Fleet". The hopes that they would put to sea also seemed unlikely unless the Germans lost their heads as there were plenty of alternative ports nearby in the Weser or the Elbe. On the whole the prospects of the plan achieving any real success were rather remote. Apart from this it must be recognised that even if successful nothing would have been achieved towards reducing the scale of German air attack on Great Britain. The old primary role of Bomber Command had indeed been abandoned and the force was now to be used as a weapon of Naval Co-operation.

A.H.B.  
IIA/1/10

During 1939 further consideration was given to W.A.9 (the attack on the Kiel Canal) but in July an Air Staff paper came to the conclusion that no attack should be carried out until more powerful weapons were available and neither the 1,000 lb. nor a 2,000 lb. bomb was expected to be in service before the end of 1939.(2)

A.H.B.  
IIA/1/4  
encl. 61

At the time when the W.A. plans were being drawn up it was realised that Coastal Command would be for some considerable time unable to implement W.A.12 (attacks on the German Fleet at sea) with their short range Anson and Vildebeest squadrons. In October 1937 the D.C.A.S. had brought up the question of training Bomber Command squadrons for this task. There was an unofficial understanding that twelve squadrons should be trained for the bombing of ships but as such training would have to include overseas navigation, ship recognition and other maritime subjects it was not to be expected that many squadrons could absorb this on top of their normal bomber curriculum. D.C.A.S. preferred not to lay down any precise number but to leave the choice to the A.O.C.-in-C. Bomber Command who was better informed on the training resources available. He did, however, recommend that up to half of the number should be of the medium twin-engined type in view of the small number of heavy bombers then operational. Nothing can be found in the records as to what action was taken other than a proposal to give such training as

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- (1) A report on the exercise was drawn up by the C.-in-C. Bomber Command dated 21 July 1939 and further use of this might well have been made had not the war intervened. Ref: A.M. S.1680. encl. 1B.
  - (2) The only bombs available to Bomber Command were the 250 lb. and 500 lb. G.P. and S.A.P. types and of these the S.A.P. bombs were in short supply. Ref: A.M. S.43294 encl. 3B.

was necessary to enable certain squadrons to participate in the next series of bombing trials against the Centurion.

Much later and arising out of initiative taken by the A.O.C.-in-C. Coastal Command in March 1939 it was suggested that, failing more systematic training and regular practice, Coastal Command G.R. aircraft might lead the attacking bombers or might supply G.R. pilots and observers in the leading bomber aircraft for navigation and recognition purposes. After considerable discussion the second alternative was accepted and at a conference held on 22 August 1939 it was proposed to exercise eight selected Bomber Command squadrons totalling 78 aircraft with the Home Fleet as a start to more consistent training. Unfortunately the decision was taken too late and the war broke out before any such exercise or training could take place.

A.H.B.  
IIX/54/3/16  
encls. 1A to  
15A

ibid  
encls. 24A  
to 32A

C.O.S. 968  
and  
A.H.B.  
II/43/98A  
encls. 2A  
and 4A

C.O.S. 972  
29.8.39

Thus the Air Staff were forced to enter the war with little intention of doing anything with Bomber Command beyond dropping leaflets, performing reconnaissance, and possibly releasing a few bombs on ships in harbour or roadsteads. Within the political limitations of restricted action it would not be worth sending out aircraft to bomb on a large scale and it was better to await the removal of these restrictions before thinking of changing the policy of conservation. It was realised, however, that something more might have to be done, if only to meet public demands for action. The complete list of the W.A. Plans as at 13 June 1939 is given at Appendix XII.

(vii) The protection of East Coast shipping against air attack

The problem of the protection of East Coast merchant shipping from enemy air attack had come to the fore as the result of the publication on 30 January 1939 of the Third Interim Report of the C.I.D. Sub-Committee on Bombing and A/A Gunfire Experiments.(1) One of the conclusions reached by this Sub-Committee of Scientists was that "the problem of the protection of merchant shipping from air attack is at present unsolved". The Sub-Committee also urged that "policy as regards air attack on and anti-aircraft defence of a fleet and of merchant shipping should be reviewed in all its aspects - strategical, tactical, and supply - without delay". This independent and uncompromising view of the seriousness of the situation was deeply disturbing, especially to the Naval Staff.

Before the Third Interim Report was submitted to the Committee of Imperial Defence, Admiral Lord Chatfield, who was the Minister for the Co-ordination of Defence, considered it necessary to hold a special meeting of the Defence Ministers and their Advisers. At this meeting, which was held on 8 February, discussion centred on the necessity of reviewing the arrangements for the diversion of shipping from the East to the West coast ports. When the 349th C.I.D. Meeting considered the findings of the Third Interim Report on 3 March, the Minister of Transport, who had emphasised the difficulties entailed in any large-scale diversion of shipping, was asked to prepare an early report showing the extent to which it would be practical to exercise such diversion at the outset of war. A joint Admiralty/Air Ministry memorandum on current plans for the protection of merchant shipping against air attack was also called for.

A.M.  
S.49866  
encl. 3A

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(1) See Chapter IX (ix).

(a) The question of diversion

On the question of diversion, the conclusions reached by the Ministry of Transport and by the Admiralty/Air Ministry did not coincide. The Ministry of Transport advised against any sudden or large-scale diversion of shipping from the East coast to the West in the early stages of hostilities and was in favour of a gradual and ad hoc redistribution which could be put into force without serious dislocation and adjusted to the changing needs of the war situation. He recommended that the general principle for dealing with overseas imports in time of war should be to make use to the greatest possible extent of normal facilities until prevented from doing so by enemy naval or air action, by congestion at the ports or inland, or by supply conditions. As an exception to this principle, the Minister suggested that ocean going ships normally proceeding to London should on or shortly before the outbreak of hostilities be either diverted to west coast ports or held in relatively safe anchorages pending the development of the situation. These recommendations were approved on 23 April by the Committee of Imperial Defence who, at the same time, gave instructions that the preparations for dealing in the West with shipping diverted in time of war from East Coast ports should be accelerated.(1)

C.I.D. 316-A  
13.4.39

This policy was, however, altered on 29 June when the Committee of Imperial Defence had had the opportunity of discussing the Joint Admiralty/Air Ministry memorandum on the protection of merchant shipping from air attack. This memorandum emphasised that while undesirable from an economic point of view, the diversion of shipping to areas west of the general system of air defence would provide a very welcome measure of security. The Secretary of State for Air (Sir Kingsley Wood) also pointed out that in all probability the North Sea and English Channel would constitute the main battle zone in the next war so far as the air forces were concerned and that, no matter to what extent aircraft ranges and speeds might increase, the degree of protection we should be able to afford to ports in the west of England would always be greater than in the East. The C.I.D. concluded that the previous policy should, therefore, be modified to the extent that diversion should initially be extended not only to ocean shipping bound for London but also to all ocean shipping proceeding to east coast ports generally.

363rd C.I.D.  
Meeting

(b) The Trade Protection fighter squadrons

Another measure which was recommended in the Joint Memorandum was that fighter aircraft should be specially earmarked for shipping protection duties on the East Coast. The memorandum drew attention to the fact that aircraft carrying out anti-submarine patrols or escorting convoys would have no value against enemy air attack since they would operate several miles ahead of the convoys and their crews would need to concentrate on searching for submarines. Nor would the ordinary defensive facilities afforded by Fighter Command suffice since the normal interception area could at best, and then only along certain stretches, be extended about five miles out to sea, owing to the necessity of remaining in R/T touch with Group or Sector headquarters. These limitations

C.I.D.  
1557-B

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(1) According to the current C.I.D. ruling all ports between the Tyne and Southampton inclusive were regarded as East Coast Ports. Ref: 353rd C.I.D. Meeting.

indicated that, in certain areas, shipping would need to be escorted by fighter patrols. It was estimated that to operate in daylight patrols of three aircraft at selected points between Southampton and the Firth of Forth would require four squadrons of long range fighters. The Air Staff calculated that by this means some protection could be given to shipping against sudden or low flying air attacks and that high level bombing could be rendered inaccurate. The ultimate capital cost of these squadrons with the necessary airfields and other facilities would be about £5 million. The annual costs for maintenance would be about £750,000. The earliest date for the formation of these squadrons, if immediate authority were given, would be October 1940. This sanction was in fact given by the Committee of Imperial Defence on 1 August 1939. However, under the stress of war, these four squadrons were formed considerably earlier than the above forecast. See R.A.F. in Maritime War Vol. II chap. I (x).

C.I.D. Paper  
D.P.R. 327  
26.7.39

371st C.I.D.  
Meeting

(viii) Operational training in 1939 up to the end of July

The year started with a full dress Exercise KA held in the South Western Approaches. The Home Fleet was leaving on their Spring cruise and opportunity was taken to test the local defences against attack by surface forces and submarines. Four flying boat squadrons and one Anson squadron took part between 16 and 20 January. The exercise revealed serious control difficulties as there was not yet a No. 15 Group H.Q. in existence and the air operations had to be controlled from Lee-on-Solent which was out of close touch with the Naval control at Portland. Bad weather also hampered operations but valuable lessons were learnt.

See  
Appendix XI  
A.H.B.  
IK/47/4

February saw torpedo attack practices by Nos. 22 and 42 Sqdns. against H.M. ships and a series of night searches and screening exercises with the A/S School by flying boats and Ansons. An interesting search by No. 48 Anson Sqdn. resulted in the location and photographing in the channel of the German naval tanker Westerwald and U.36.

Squadron  
O.R.B.s  
and  
Appendix XI

During March the torpedo and A/S practices continued in the first fortnight followed by another full scale Exercise KC with the Home Fleet when returning to the Western Channel waters between 16 and 24 March. An Anson and four flying boat squadrons again took part and this time the air operations were adequately controlled by the new No. 15 Group installed in a temporary Combined Operations Room at Plymouth. Once again No. 48 Sqdn. in the course of a search exercise located and photographed German units, this time a squadron of warships in the southern part of the North Sea.

ibid

April and May provided fairly continuous exercises in screening patrols, co-operation with submarines, and searches culminating in torpedo and bombing attacks on various warship units. On 16 May No. 217 Sqdn.'s Ansons located and photographed four German submarines in the English Channel. The first four days of June saw eight Coastal Command aircraft engaged in the location of and subsequent co-operation with the efforts to salve the sunken submarine Thetis in Liverpool Bay. During the rest of the month and in July there were search and shadowing exercises with various single warships as well as the Home Fleet while torpedo attacks were also carried out together with the usual co-operation training by No. 217 Sqdn. with the A/S School. August was notable, not only for being the last month of peace, but as the last occasion of full scale combined exercises.

ibid

(ix) The last Combined Exercise

The situation in the Far East during the early summer of 1939 was tense. Japan had been and was pursuing a policy of calculated insults against British and French interests in Peking, Tientsin and Shanghai. The Government dare not threaten reprisals or economic sanctions for fear of precipitating a war with Japan for which we were utterly unprepared in the Far East and one in which both Germany and Italy would probably join. Ever since November 1937 the Chiefs of Staff had insisted that we could not hope to defend ourselves if all three nations attacked us simultaneously.

C.O.S.639  
and  
C.I.D.1366-B

When, therefore, in July 1939 it was arranged to hold negotiations with Japan at Tokyo to ameliorate the dangerous tension it was felt that nothing should be done to jeopardise them. At the same time it was proposed that naval reinforcement destined for the Far East should be quietly concentrated initially in the Eastern Mediterranean. Such reinforcement could only be found if every available British capital ship in Home Waters was fully operational with no repair or refit commitment due to take place in the near future. This could best be achieved unobtrusively by advancing the summer leave and refitting period of the Home Fleet to July and publicly announcing that this change of normal programme had been made to enable the Fleet to take part in combined exercises with the Royal Air Force during the month of August.

C.O.S.945  
17.7.39

ibid

This was in fact done and the exercise XKD took place from 15 to 21 August. The exercise covered the North Sea and its northern approaches and was designed to practise the whole of the Air and Navy organisation for the location and destruction of enemy surface units coming into, breaking out of, or operating in that area.

Red (British) naval forces were under the C.-in-C. Home Fleet and comprised four capital ships, one aircraft carrier, two cruiser squadrons, two destroyer flotillas and several submarines. The Red air forces consisted of the whole of Nos. 18 and 16 Groups totalling four flying boat squadrons, six G.R. Anson squadrons and one torpedo bomber squadron.(1) All these squadrons were at their war stations. The two Area Combined Headquarters at Rosyth and Chatham were fully manned as also was the Command Headquarters now established at its permanent site at Northwood, Middlesex.(2)

A.M.  
S.1691

(1) Disposition of squadrons

<u>No.18 Group</u>		<u>No. 16 Group</u>
<u>Shetlands</u>	No.201 F/B Sqn.	<u>Bircham Newton</u>
Depot ship	- S.S. Manela	No.206 Anson Sqn.
<u>Invergordon</u>	- Nos.209 and 210 F/B Sqns.	No. 42 Vildebeest Sqn.
<u>Woodhaven</u>	- No.210 F/B Sqn. - 3 A/C	<u>Detling</u>
<u>Montrose</u>	- No.269 Anson Sqn.	No. 48 Anson Sqn.
<u>Leuchars</u>	- No.224 and 233 Anson Sqns.	
<u>Thornaby</u>	- No.220 Anson Sqn.	

(2) Three officers from the Admiralty Operations Division had been appointed to Coastal Command Headquarters. They were Commanders G. C. Pelly, D. V. Peyton-Ward and C. W. L. Meynell.

Blue (enemy) naval forces were controlled by the Flag Officer 2nd Cruiser Squadron and consisted of naval units representing two battlecruisers, eight cruisers and numerous submarines. Certain Royal Fleet auxiliaries were used to represent armed merchant ship raiders. Powerful (imaginary) air forces were assumed to be operating from Blue bases (Germany).

Concurrently was held the subsidiary Exercise KE, designed to test the organisation for laying the Dover Mine Barrage. The forces allotted consisted of one minelayer, one destroyer flotilla and two minesweeping flotillas under the control of the C.-in-C. Nore. Air cover could be provided by the Anson squadron based at Detling, Kent. Enemy interference was represented by two Blue light cruisers.

The scheme of the air operations comprised the maintenance of the standard North Sea reconnaissance patrols, the reporting and shadowing of any Blue forces located so as to enable them to be brought to action by the Red naval forces and if within range to deliver squadron torpedo and bombing attacks on such Blue forces. There is, however, unfortunately no trace of any records of the air operations actually carried out either at Command or Squadron level. Neither is there any trace in the Admiralty or Air Ministry records of a report on the Exercises nor the lessons learnt. All that can be said is from the author's memory and rough notes taken at the time in the Coastal Command Headquarters Operations Room. This is to the effect that the Exercise XKD showed the weakness inherent in the air reconnaissance system by reason of its blank period during the dark hours, it revealed a continuance of navigational report errors, and some faulty ship recognition. But it did provide valuable practice in the exercise of Command and Group control, and in Operations Room procedure.

Ironically enough, it was during the last two days of the exercise that fourteen U-boats were doing just what it was designed to prevent and within a day or two of its termination these were followed by two German pocket battleships.

(x) The Outbreak of the Second World War

The exercises terminated on 21 August 1939 and this date coincided with the announcement of a Soviet-German Non-aggression Pact in conditions of serious international tension. Headquarters Coastal Command signalled the following instructions to the three operational groups:-

Units which had taken part in the exercises were to return to their parent stations to undertake inspections, after which Nos. 42, 201, 209, 220 and 240 Squadrons were to go back to their war stations. Nos. 48, 217 and 269 Squadrons were to remain at 12 hours notice to move to their war stations. The training of Nos. 224 and 233 Squadrons on the new Hudson aircraft was to be accelerated. The operations rooms of Nos. 16 and 18 Groups were to be manned with skeleton crews until further notice. All landlines used in the exercises were to be retained and the landlines from No. 15 Group H.Q. to units and higher formations were to be re-instated.

A.M.  
S.48245  
encl. 58A

C.O.S.960  
and  
C.O.S.962

On the 23 August the Soviet-German Pact was officially signed in Moscow and Europe now obviously stood on the brink of war. A precautionary stage was initiated and all Coastal Command squadrons were deployed to their war stations. On the 24 August a few North Sea reconnaissance patrols were begun again by No. 18 Group but the submarines did not resume their patrols in the air gap off southwest Norway until early on the 27th.

In retrospect, the maintenance of the scheduled date of the 15 August for the start of Exercise XKD seems unwise in view of the known rapidly worsening of international relations earlier in August. Although the objects of the Exercise were excellent it did mean that all the forces taking part would be out of action for some days afterwards while they replenished and regained operational readiness. Be that as it may, in the light of after events the timing of the Exercise was most unfortunate in that between 20 and 26 August a stream of U-boats plus two pocket battleships were traversing the southwest coasts of Norway unseen on their way out into the Atlantic, and the previous fears of the Admiralty were realised.

Fourteen ocean-going U-boats had left Wilhelmshaven and Kiel on 19 August bound for the Atlantic northabout Scotland and must have traversed the reconnaissance patrols during the 20th and 21st. The pocket battleship Graf Spee left Wilhelmshaven on 21 August and passed 30 to 40 miles off the southwest corner of Norway during daylight on the 22nd - less than a day after the end of Exercise XKD but nearly two days before the resumption of air patrols on the 24th. During this cessation of reconnaissance cover two more U-boats left Wilhelmshaven bound northabout for the Atlantic. The pocket battleship Deutschland sailed from Wilhelmshaven at 1500 hours on 24 August reaching Utsire Light (off S.W. Norway) at 0915/25th in five mile visibility. Thereafter the weather thickened and by dawn on the 26th it was dense fog under cover of which she altered across north of the Shetlands and thence to the north of Iceland. On 25 August a further fourteen smaller U-boats left Wilhelmshaven for patrol positions in the North Sea.(1) The foggy weather was widespread and cancelled all Coastal Command flying over the North Sea on both the 25 and 26 August. The air patrols were not resumed until daylight on 27 August and the five submarines were again sent to patrol in the 60 mile air gap off the southwest corner of Norway.

It may well be asked whether our Intelligence was aware of the sailing of two pocket battleships and 30 U-boats during this time of extreme political tension. Research into the German Archives establishes that all their naval movements had been carefully planned and were ready to be put in operation

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(1) The authority for U-boat sailings is the S.O. U-boats War Diary. For the precise U-boat identities see R.A.F. in Maritime War Vol. II Chap. II. The movements of the pocket battleships are recorded in their respective logs held in the Admiralty Foreign Document Section. Subsequently the Graf Spee together with her supply ship Altmark went to a waiting position to the northwest of the Azores and the Deutschland with the Westerwald to a position just east of Greenland.

by 15 August. The actual sailings were under sealed orders so that wireless silence was strictly observed. This gave no chance to our still rudimentary 'Y' service to detect movements or subsequent dispositions in the Atlantic. At this period our sources for intelligence in German ports were poor so that at no time did we secure reliable information on the location in harbour of German fleet units. Although the Director of Naval Intelligence reported at midnight on 23 August that there were unconfirmed indications that between six and ten U-boats were absent from German home waters and on 26 August that there was a possibility that two pocket battleships were at large, it was not till late on 31 August that the Admiralty signalled all Naval Commands that there was some indication that German large ships had left Wilhelmshaven and even then the date given for this departure was given as either p.m. on the 30th or a.m. on the 31 August.

Our Intelligence was not so much inefficient as totally inadequate. German intelligence, on the other hand, was very accurate. They knew about our Exercise XKD and carefully surveyed the proposed routes for the pocket battleships by previous air reconnaissance. Moreover they knew the exact whereabouts of all our units of cruiser size and above both in our home waters and in the Atlantic - this was undoubtedly due to the lax observance of signal security measures by our warships.

The reconnaissance air and submarine patrols continued unbroken from 27 August(1) but nothing of note was sighted during the ensuing week. The international crisis culminated with our ultimatum to Germany which expired at 1115 hours on 3 September 1939 and the Second World War commenced.

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(1) See Map No. 3 for the Standard Reconnaissance patrols, the Anti-submarine dispositions and the location of Coastal Command squadrons. The Order of Battle for this date is at Appendix V.

Admiralty  
Records

APPENDIX I

Allied Ships of 500 tons G.R.T. and above sunk by U-Boats - 1 Feb. 1917 to 31 Oct. 1918

Area	1917												1918									
	Feb.	Mch.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mch.	Apr.	May	June	July	Aug.	Sept.	Oct.	
North Sea and East Coast	12	27	23	19	15	13	20	11	17	14	12	6	8	11	3	9	21	12	10	4	1	
English Channel	25	31	16	29	12	20	17	17	23	28	37	23	20	26	23	4	9	3	8	8	6	
Irish Sea	7	19	1	3	-	2	-	-	6	4	8	8	16	16	15	9	2	-	4	10	7	
Bristol Channel	14	6	8	5	7	8	10	6	10	5	9	6	8	9	8	13	3	5	8	12	1	
West coast of Ireland	3	2	3	5	8	6	15	2	-	-	3	2	3	5	2	-	3	1	-	-	1	
N.W. Approaches	-	2	10	4	10	8	4	3	1	-	-	-	-	-	1	-	-	-	2	-	1	
S.W. Approaches	29	28	58	24	44	28	11	4	3	-	1	-	-	-	2	5	3	6	-	3	1	
Biscay area	14	19	15	21	19	13	17	7	4	4	5	8	1	-	-	1	-	3	3	2	3	
Corunna to Dakar	2	2	14	3	13	5	3	10	12	2	2	3	8	6	2	2	-	4	1	1	-	
W. of Bay and mid-Atlantic	-	-	1	1	6	9	5	2	6	6	1	-	3	5	1	6	3	4	9	5	3	
Total - Eastern Atlantic	106	136	149	114	134	112	102	62	82	63	78	56	67	73	57	49	44	38	45	45	24	
American Seaboard	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10	-	12	1	1	
Mediterranean	27	17	56	36	30	18	20	19	35	22	34	30	20	27	20	28	13	20	13	10	10	
Other Areas and unknown	5	11	21	6	9	8	14	6	4	1	-	1	1	3	-	1	-	-	1	-	-	
Grand Total	138	164	226	156	173	133	136	87	121	86	112	87	88	108	77	78	67	58	71	56	35	

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APPENDIX I

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## APPENDIX II

## Anti-U-Boat Flying effort in Home Waters and results - 1917 and 1918

Month	Seaplanes, Flying Boats and Landplanes							Airships						
	No. of Area Patrols	No. of Escorts	Total Sorties	Total Hours flown	U-Boats			No. of Area Patrols	No. of Escorts	Total Sorties	Total Hours flown	U-Boats		
					S.	A.	Prob. Sunk					S.	A.	Prob. Sunk
Jan. to Mch. 1917	NOT KNOWN				3	3		NOT KNOWN				-	-	-
Apr. and May	NOT KNOWN				32	19	UB.39 Sh. UC.36	NOT KNOWN				4	3	-
June	518	46	564	1,117	13	7	UB.36	318	46	364	1,808	-	-	-
July	651	53	704	1,451	11	9	UC. 1 UB.20	348	59	407	2,243	2	0	-
Aug.	333	77	410	820	12	6	UB.32	210	33	243	1,129	2	1	-
Sept.	611	92	703	1,480	28	18	UC.72 UC. 6	457	86	543	3,116	6	2	-
Oct.	514	75	589	1,149	14	10	-	240	44	284	1,479	4	2	-
Nov.	584	52	636	1,266	18	10	-	337	63	400	2,216	5	3	-
Dec.	747	68	815	1,592	9	7	-	302	59	361	1,934	5	5	-
Jan. 1918	433	34	467	847	6	2	-	127	47	174	832	1	1	-
Feb.	671	35	706	1,378	5	2	-	231	37	268	1,416	-	-	-
Mch.	1,209	80	1,289	2,718	19	14	-	470	132	602	4,055	3	1	-
Apr.	1,526	176	1,702	3,497	10	8	-	415	184	599	4,290	1	1	-
May	2,751	402	3,153	7,328	34	26	UC.49 Sh.	846	269	1,115	8,373	5	4	-
June	2,364	453	2,817	6,812	24	16	-	518	170	688	5,082	3	2	-
July	2,399	751	3,150	7,033	22	16	-	345	179	524	3,762	2	0	-
Aug.	4,485	1,340	5,825	12,583	32	24	UB.12 UC.70 Sh.	785	454	1,239	8,991	3	2	-
Sept.	2,989	820	3,809	7,408	5	3	-	351	144	495	2,760	2	1	UB.103 Sh. UB.115 Sh.
Oct.	4,100	921	5,021	9,531	5	4	-	549	204	753	6,215	3	1	-

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APPENDIX II

U-Boats probably Sunk or Shared Sunk by aircraft in the First-World WarAPPENDIX III

U-boat	Date	Position	Author	Duty
Unidentified	26 Aug. 1915	6 <sup>th</sup> N.N.W. of Ostend	Landplane - 65 lb bombs	Patrol
UB.39	24 Apr. 1917	18 <sup>th</sup> S. of Portland Bill	Shared (Flying boat - 100 lb bombs (H.M. destroyer - D.Cs	Patrol
UC.36	20 May 1917	10 <sup>th</sup> E. of N. Hinder L.V.	Flying boat - 230 lb bombs	Patrol
UB.36	28 June 1917	10 <sup>th</sup> W. of N. Hinder L.V.	Flying boat - 100 lb bombs	Convoy Escort
UC.1	24 July 1917	6 <sup>th</sup> S.S.W. of N. Hinder L.V.	Flying boats - 230 lb bombs	Patrol
UB.20	29 July 1917	7 <sup>th</sup> W.N.W. of N. Hinder L.V.	Flying boats - 100 lb bombs 230 lb bombs	Patrol
UB.32	18 Aug. 1917	25 <sup>th</sup> N.E. of Cherbourg	Seaplane - 100 lb bombs	Patrol
UC.72	22 Sept. 1917	Near W. Hinder L.V.	Flying boat - 230 lb bombs	Patrol
UC.6	28 Sept. 1917	25 <sup>th</sup> S. of Hinder L.V.	Flying boat - 230 lb bombs	Patrol
UC.49	30 May 1918	Off Sunderland	Shared (Landplane - 100 lb bombs (Subsequent air/sea hunt	Convoy escort
UB.12	12 Aug. 1918	N. of Ostend	Landplane - 230 lb bombs	Patrol
UC.70	28 Aug. 1918	Off Whitby	Shared (Landplane - 520 lb bombs (H.M. destroyer - D.Cs	Convoy Escort
UB.103	16 Sept. 1918	7 <sup>th</sup> S.E. of Folkestone	(Airship Z.1 (sighting) (H.M. Ships	Patrol
UB.115	29 Sept. 1918	Off Newbiggin Point	Shared (Airship R.29 - 230 lb bombs (H.M. destroyer - D.Cs	Convoy Escort
Total		9 probable Kills - plus 5 probable kills shared with H.M. Ships.		

R.A.F. STRENGTH SUMMARY - 1918 TO 1939The number of active R.A.F. Squadrons and Flights

Month Year	C L A S S I F I C A T I O N						TOTAL R.A.F.	
	Maritime Aircraft				Bomber, Fighter, A.C.			
	At Home		Overseas		At Home	Overseas		
	Shore based	Ship borne	Shore based	Ship borne				
Nov. 1918	37 + 7 Flts	6	15	-	18	117 + 8 Flts	193 + 15 Flts	
Oct. 1919	<u>Coastal Area</u>							
	2	6	5	-	14	21	48	
Mar. 1920	2	4 + 2 Flts	1 + 1 Flt	-	3	17	27 + 3 Flts	
Jan. 1922	2	3	1	1 Flt	7	20	33 + 1 Flt	
Apr. 1923	1	<u>F.A.A.</u> 4	1	<u>F.A.A.</u> 1 Flt	6	22	<u>R.A.F.</u> 30	<u>F.A.A.</u> 4+1Flt
Apr. 1924	1 Flt	12 Flts	1 Flt	3 Flts	18	18	36 + 2 Flts	15 Flts
Apr. 1926	1 Flt	12 Flts	1 Flt	6 Flts	32	18	50 + 2 Flts	18 Flts
Jan. 1929	3	11 Flts	1 + 1 Flt	12 Flts	39	17	60 + 1 Flt	23 Flts
May 1931	4	14 Flts	4	12 Flts	45	19	72	26 Flts
June 1933	5	7 + 4 Flts	4	5 + 2 Flts	47	19	75	12 + 6 Flts
June 1935	6	9 + 3 Flts	5	4 + 4 Flts	48	19	78	13 + 7 Flts
	<u>Coastal Command</u>							
Dec. 1936	11	7 + 4 Flts	6	6 + 7 Flts	72	21	110	13 + 11 Flts
Dec. 1937	13	8 + 4 Flts	8	5 + 7 Flts	108	21	150	13 + 11 Flts
Jan. 1939	18	-	6	-	106	24	154	-
Aug. 1939	18	-	7	-	106	25	156	-

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APPENDIX IV (contd.)

Some First Line Strengths of the R.A.F.

<u>October 1925</u>					
	<u>Fighters</u>	<u>Bombers</u>	<u>Maritime</u>	<u>Army Co-op</u>	<u>Total</u>
Regular R.A.F.	Home - 132 (10 Sqdns)	134 (11 Sqdns)	7 (one Flt)	48 (4 Sqdns)	- 321
	Overseas - 12 (1 Sqdn)	134 (11 Sqdns)	12 (one Flt)	60 (6 Sqdns)	- 218
F.A.A. Component	<u>Fighters</u> - 36 (6 Flts)	<u>Spotter/Recce</u> 51 (9 Flts)	<u>Torpedo</u> 18 (3 Flts)		- 105
			<u>Grand Total</u>		- 644

<u>July 1929</u>					
	<u>Fighters</u>	<u>Bombers</u>	<u>Maritime</u>	<u>Army Co-op</u>	<u>Total</u>
Regular R.A.F.	Home - 156 (13 Sqdns)	264 (22 Sqdns)	24 (3 Sqdns)	60 (5 Sqdns)	- 504
	Overseas - Nil	156 (13 Sqdns)	24 (3 Sqdns)	72 (6 Sqdns)	- 252
F.A.A. Component	<u>Fighters</u> - 42 (8 Flts)	<u>Spotter/Recce</u> 63 (11 Flts)	<u>Torpedo</u> 30 (5 Flts)		- 141
			<u>Grand Total</u>		- 897

<u>January 1934</u>					
	<u>Fighters</u>	<u>Bombers</u>	<u>Maritime</u>	<u>Army Co-op</u>	<u>Total</u>
Regular R.A.F.	Home - 168 (14 Sqdns)	336 (28 Sqdns)	30 (5 Sqdns)	50 (5 Sqdns)	- 584
	Overseas - Nil	150 (14 Sqdns)	32 (4 Sqdns)	50 (5 Sqdns)	- 232
F.A.A. Component	<u>Fighters</u> 57 (4 Sqdns) (3 Flts)	<u>Recce</u> 66 (5 Sqdns) (3 Flts)	<u>Torpedo</u> 36 (5 Sqdns)		- 159
			<u>Grand Total</u>		- 975

<u>August 1939</u>					
	<u>Fighters</u>	<u>Bombers</u>	<u>Maritime</u>	<u>Army Co-op</u>	<u>Total</u>
Regular R.A.F.	Home - 480 (40 Sqdns)	684 (57 Sqdns)	248 (18 Sqdns)	108 (9 Sqdns)	- 1,520
	Overseas - 36 (3 Sqdns)	216 (18 Sqdns)	72 (7 Sqdns)	48 (4 Sqdns)	- 372
			<u>Grand Total</u>		- 1,892
Separate Naval Air Service -	<u>Fighters</u> 39 (4 Sqdns)	<u>T.S.R.</u> 132 (11 Sqdns)	<u>Catapult Recce</u> 64 (11 Flts)		- 235

R.A.F. ORDERS OF BATTLE, LOCATIONS AND ESTABLISHMENTS  
AT VARIOUS DATES BETWEEN 1918 AND 1939

THE R.A.F. IN NOVEMBER 1918

<u>United Kingdom</u>	
Home Waters Anti-Submarine *	37 squadrons
Grand Fleet shipborne	5 squadrons
No. 29 Group shipborne and ashore	1 squadron plus 7 flights
Home Defence	18 squadrons
<u>France and Belgium</u>	
Western Front	86 squadrons
Dunkirk No. 5 Group	3 squadrons plus 1 flight
Independent Force	10 squadrons plus 6 flights
<u>Overseas</u>	
Italy	4 squadrons
Mediterranean Anti-Submarine	15 squadrons
Middle East	14 squadrons plus 1 flight
R.A.F. Total including shipborne	193 squadrons plus 15 flights

\* There were in addition 103 Naval Airships employed on this duty.

The Maritime Component was, therefore:-

Home Waters	43 squadrons plus 7 flights
Mediterranean Waters	15 squadrons

/DETAILS OF MARITIME COMPONENT  
NOVEMBER 1918

DETAILS OF MARITIME COMPONENT - NOVEMBER 1918Home Waters

Group	Location	Squadrons and Flights	Numbers
No. 4	Yarmouth to Kent	Nos. 212, 219, 228, 229, 230, 231, 232, 247, 259, 261 and 273	11
No. 9	Devon & Cornwall	Nos. 234, 235, 236, 237, 238, 239, 250, 254 and 260	9
No. 10	English Channel	Nos. 240, 241, 242, 243 and 253	5
No. 14	Wales	Nos. 244, 245 and 255	3
No. 18	Northumberland to Yorkshire	Nos. 246, 248, 251, 252 and 256	5
No. 22	Dundee area	Nos. 249, 257, 258, 272 and No. 400 Flight	4 plus 1 flight
No. 28	North Sootland	Nos. 306 and 430 Flights	2 flights
No. 29 and Fleet	North Sootland	Fleet Carriers - 48 aircraft approx. Other Warships - 50 aircraft approx. Nos. 300, 309, 310 and 311 Flights	6 plus 4 flights
Total - 43 Sqdns. plus 7 Flights			

Mediterranean Waters

Location	Squadrons	Numbers
Malta	Nos. 267 and 268	2
Otranto	Nos. 224, 225 and 263	3
Taranto	No. 271	1
Aegean	Nos. 144, 220, 221, 222, 223, 226, 264 and 266	8
Port Said	No. 269	1
Total - 15 Squadrons		

/DETAILS OF MARITIME COMPONENT -  
AUGUST 1919

DETAILS OF MARITIME COMPONENT - AUGUST 1919

Home Waters

Location	Squadrons and Flights	Active Numbers
Yarmouth to Kent	No. 212 and Nos. 406 and 442 Flights (plus Nos. 229, 230, 259 and 261 reduced to cadre)	1 sqdn. 2 flights
Plymouth	No. 238	1 sqdn.
English Channel	No. 186 stationed at Gosport	1 sqdn.
Yorkshire	No. 402 Flight (Plus No. 249 reduced to cadre)	1 flight
Home Fleet and No. 29 Group	Five Fleet Carriers - 48 aircraft approx. Other warships - 50 aircraft approx. Nos. 306 and 430 flights	6 sqdns. 2 flights
Total - 6 Shipborne sqdns and Active Shorebased - 3 sqdns and 5 flights. (plus 5 sqdns. reduced to cadre)		

Mediterranean Waters

Malta	Nos. 267 and 268	2
Taranto	Nos. 224 and 263	2
Aegean	Nos. 220, 221, 222, 223, 264, and 266	6
Port Said	No. 269	1
Alexandria	No. 270	1
Total - A few aircraft in 4 small carriers and 12 shorebased sqdns.		

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APPENDIX V (Contd.)

THE R.A.F. IN OCTOBER 1919

R.A.F. Coastal Area (Maritime) created in September 1919

A.H.Q. - 4 Thurloe Place - London - S.W.7

A.O.C. - Air Vice-Marshal A. V. Vyvyan, C.B., D.S.O.

No. 10 Group - H.Q. Warsash, Southampton

Gosport

No. 186 Sqdn. - Torpedo - Cuckoo I.s (12) (I.E.)  
Torpedo Development Base  
Special Experimental Flight (with R.N. Signal School)

Polegate, Sussex

Airship Station

Cattewater, Plymouth

Sea Rocce - No. 238 Sqdn. - F2A flying boats (9)

Calshot - Aerial Navigation School

Lee-on-Solent - Naval Co-operation School

No. 29 Group - H.Q. - 12 Great Stuart Street, Edinburgh

Units ashore

Fleet Aircraft Depot - Donibristle  
Fleet Training and Practice - Leuchars  
Fleet Practice Stations - Smoogroo and Turnhouse  
Seaplane stations - Dundee and Houton Bay

Units afloat

In Carriers Argus, Furious, Nairana, Pegasus and Vindictive -  
a total of 48 aircraft approx.  
In other warships - a total of 24 aircraft approx.

The R.A.F. in the Mediterranean (Maritime)

Malta

No. 267 Sqdn. - F.2A flying boats (3)  
No. 268 Sqdn. - Short 320s Seaplanes (6)

Aegean

No. 221 Sqdn. - D.H.9A (12)  
No. 266 Sqdn. - Short 184.s (6)

Alexandria and Port Said

No. 269 Sqdn. - D.H.9A and some Fairey IIIC floatplanes (6)  
A few aircraft in Carriers Ark Royal, Engadine and Empress

/R.A.F. Home Commands

R.A.F. Home Commands - October 1919

Southern Area - H.Q. Uxbridge

No. 1 Group

- Swingate - No. 212 Sqdn. - D.H.9
- Westgate - No. 219 Sqdn. - D.H.9
- Ford - No. 22 Sqdn. - Bristol fighters

Home Defence Wing

- Biggin Hill - No. 39 Sqdn. - Bristol fighters
- Detling - No. 143 Sqdn. - Sopwith Camels

Midland Area - H.Q. Leamington Spa

No. 3 Group

- Bircham Newton - No. 274. Sqdn. - Handley Page O/400.s

No. 12 Group

- Spittlegate - No. 43 Sqdn. - Snipes
- No. 70 Sqdn. - Camels
- Scopwick - No. 11 Sqdn. - Bristol fighters

Northern Area - H.Q. York

No. 16 Group

- South Carlton - No. 25 Sqdn. D.H.4

Ireland - H.Q. Dublin

No. 11 (Irish) Group

- Oranmore - No. 105 Sqdn. - Bristol fighters
- Fermoy - No. 106 Sqdn. - Avro, R.E.8 and D.H.9
- Gormanston - No. 117 Sqdn. D.H.9
- Tallaght - No. 141 Sqdn. - Bristol fighters.

R.A.F. Overseas Commands - October 1919

Rhine Command - H.Q. Cologne

- Heumar - No. 12 Sqdn. - Bristol fighters

France and Flanders

- St. Ingelvert - No. 100 Sqdn. - F.E.2b

Egypt

- Heliopolis - No. 58 Sqdn. - Handley Page O/400.s and Vickers Vimy
- H.Q. Training Brigade
- Helwan - No. 206 Sqdn. - D.H.9
- Aboukir - No. 80 Sqdn. - Snipes

/Turkey

R.A.F. Overseas Commands - October 1919 (contd.)

Turkey

Constantinople - No. 17 Sqn. - D.H.9

South Russia

Ekaterinodar - No. 47 Sqn. - D.H.9A

Palestine

Ramleh - No. 111 Sqn. - Snipes  
Ismailia - No. 113 Sqn. - R.E.8  
Abu Sueir - No. 214 Sqn. - Handley Page O/400.s  
Suez - No. 216 Sqn. - D.H.9  
Kantara - No. 216 Sqn. - Handley Page O/400.s

Mesopotamia

Basrah - No. 6 Sqn. - R.E.8  
Bagdad - No. 63 Sqn. - R.E.8  
- No. 72 Sqn. - Snipes

India

Parachinar - No. 20 Sqn. - Bristol fighters  
Ambala - No. 99 Sqn. - D.H.9A  
Allahabad - No. 97 Sqn. - Handley Page O/400.s and  
D.H.10A  
Risalpur - No. 31 Sqn. - Bristol fighters  
Quetta - No. 114 Sqn. - Bristol fighters  
- No. 48 Sqn. - Bristol fighters

/THE R.A.F. IN MARCH 1920

THE R.A.F. IN MARCH 1920R.A.F. Coastal Area (Maritime)

A.H.Q. - 4 Thurloe Place - London - S.W.7

A.O.C. - Air Vice-Marshal A. V. Vyvyan, C.B., D.S.O.

Units administered direct from London

Seaplane station at Killingholme

Airship stations at East Fortune, Howden and Pulham

Various Meteorological Stations

No. 10 Group - H.Q. Warsash, SouthamptonGosport

No. 210 Sqn. - Torpedo - Cuckoo I.s (I.E.) (12)

Torpedo Development Squadron - Cuckoo I.s (3)

Coastal Battery Co-op Flight

Cattewater, Plymouth

Sea Recce - No. 238 Sqn. - F.2A flying boats (9)

Polegate, Sussex - Airship stationCalshot - Aerial Navigation SchoolLee-on-Solent - Naval Co-operation SchoolNo. 29 Group - H.Q. North Queens ferryUnits Ashore

Fleet Aircraft Depot - Donibristle

Fleet Training and Practice Stations - Leuchars and Smoogroo

Seaplane Stations - Dundee and Houton Bay

No. 203 Sqn. - forming on Nightjar fighters } at Leuchars

No. 205 Sqn. - forming on Panther recce. duties }

Units Afloat

In Carriers Argus, Furious, and Pegasus - 30 aircraft approx.

In other warships - 24 aircraft approx.

The R.A.F. in the Mediterranean (Maritime)

Malta - one flight of No. 267 Sqn. - F.2A flying boats (3)

Alexandria - No. 202 Sqn. - Fairey III D float planes (12)

Aircraft in small carrier Engadine

R.A.F. Inland Area - March 1920No. 1 Group - H.Q. Kenley Common, SurreyKenley

No. 24 Sqn. - Communications

Hawkinge

No. 25 Sqn. - Forming on Snipe fighters

No. 3 Group - H.Q. Spittlegate, GranthamBircham Newton

No. 207 Sqn. - Bomber - D.H.9A

Ireland - H.Q. Dublin

No. 11 Group - H.Q. Baldonnell, Co. Dublin.

Oranmore - No. 2 Sqdn.-Army Co-op. Bristol fighters

Training Squadrons and Schools

- No. 4 Sqdn. - Shotwick, Norfolk
- No. 31 Sqdn. - Fowlmere, Norfolk
- No. 13 Sqdn. - Ternhill, Yorks.
- No. 46 Sqdn. - South Carlton, Yorks.
- No. 30 Sqdn. - Northolt, Middx.
- No. 1 Flying Training School - Netheravon
- School of Army Co-operation - Worthy Down

R.A.F. Overseas Commands - March 1920

Rhine Command - H.Q. Cologne

Heumar - No. 12 Sqdn. Bristol fighters

Egypt Command - H.Q. Cairo

Heliopolis

- No. 70 Sqdn. - Bomber - Handley Page O/400.s and Vickers Vimy
- No. 47 Sqdn. - Army Co-op - Bristol fighters

Aboukir - No. 56 Sqdn. - Fighter - Snipes

Ramleh - No. 14 Sqdn. - Army Co-op. - Bristol fighters

Ismailia - No. 208 Sqdn. - Army Co-op. - R.E.8.

Suez - No. 55 Sqdn. - Bomber - D.H.9A

Kantara - No. 216 Sqdn.-Bomber - Handley Page O/400.s

Mesopotamia Command - H.Q. Bagdad

- Bagdad - No. 6 Sqdn. - Army Co-op - R.E.8
- No. 30 Sqdn. - Bomber - D.H.9A
- No. 84 Sqdn. - forming on D.H.9A

India Command - H.Q. Delhi

Ambala - No. 28 Sqdn. - Army Co-op. - Bristol fighters

Bannu - No. 20 Sqdn. - Army Co-op. - Bristol fighters

Lahore - No. 60 Sqdn. - Bomber - D.H.10A

Mianwali - No. 27 Sqdn. - Army Co-op. - Bristol fighters

Risalpur - No. 31 Sqdn. - Army Co-op. - Bristol fighters

Quetta - No. 5 Sqdn.-Army Co-op. - Bristol fighters  
- Nos. 1 and 3 Sqdns. forming on Snipe fighters

THE R.A.F. IN JANUARY 1922R.A.F. Coastal Area (Maritime)

A.H.Q. - 33 to 34 Tavistock Place - London, W.C.1  
 A.O.C. - Air Vice-Marshal A. V. Vyvyan, C.B., D.S.O.

Units administered directFelixstowe

Sea Recce - No. 230 Sqdn. - F.2A flying boats (I.E.) (10)  
 Howden - Airship Station

No. 10 Group - H.Q. Gosport, HantsGosport

Shipborne - No. 210 Sqdn. - Torpedo - Cuckoo I.s (12)  
 Torpedo Development Sqdn. - Cuckoo I.s (3)  
 Observer and Signal Training - Westland Walrus (12)

Calshot

School of Aerial Navigation Training Flight (8)  
 School of Naval Co-operation Training Flight (5)

Lee-on-Solent

Seaplane Pilot training Flight - Fairey III D (Floatplanes) (6)

No. 29 Group \*- H.Q. North QueensferryLeuchars

Shipborne - No. 3 Sqdn. - Westland Walrus (12)  
 Shipborne - No. 203 Sqdn. - Nightjars (18)  
 Shipborne - No. 205 Sqdn. - Panthers (18)

Donibristle - Fleet Aircraft Depot

\* No. 29 Group ceased to exist in May 1922. Thereafter all units except No. 10 Group were administered direct from Tavistock Place

The R.A.F. in the Mediterranean (Maritime)Malta

No. 267 Sqdn. - F.5 flying boats (3)  
 Fairey III D float planes (8)  
 Aircraft in Carrier Pegasus - Fairey III D.(5)

R.A.F. Inland Area - January 1922No. 1 Group - H.Q. Kenley Common, Sussex.

Kenley - No. 24 Sqdn. - Communications  
Hawkinge - No. 25 Sqdn. - Fighter - Snipes  
Spittlegate - No. 39 Sqdn. - Bomber - D.H.9A  
Bircham Newton - No. 207 Sqdn. - Bomber - D.H.9A

No. 7 Group - H.Q. South Farnborough

South Farnborough - No. 4 Sqdn. - Army Co-op. - Bristol fighters  
/Ireland - H.Q. Dublin

Ireland - H.Q. Dublin

No. 11 Group - H.Q. Baldonnell, Co. Dublin

Baldonnell - No. 100 Sqn. - Army Co-op. - Bristol fighters

Fermoy - No. 2 Sqn. - Army Co-op. - Bristol fighters

Training Schools

No. 1 Flying Training School - Netheravon

No. 2 Flying Training School - Duxford

No. 3 Flying Training School - Digby

No. 5 Flying Training School - Shotwick

No. 6 Flying Training School - Manston

Central Flying School - Upavon

School of Army Co-operation - Old Sarum

R.A.F. Overseas Commands - January 1922

Rhine Command - H.Q. Cologne

Biickendorf - No. 12 Sqn. - Army Co-op. - Bristol fighters

Egypt and Palestine Command - H.Q. Cairo

Heliopolis

No. 70 Sqn. - Bomber - Vickers Vimy

No. 216 Sqn. - Bomber - D.H.10

Helwan - No. 47 Sqn. - Army Co-op. - Bristol fighters

Aboukir - No. 56 Sqn. - Fighter - Snipes

Almaza - No. 45 Sqn. - Bomber - Vickers Vimy

Ramleh - No. 14 Sqn. - Army Co-op. - Bristol fighters

Ismailia - No. 208 Sqn. - Army Co-op. - Bristol fighters

Abu Sueir - No. 4 Flying Training School.

Iraq Command - H.Q. Bagdad

Bagdad - No. 1 Sqn. - Fighter - Snipes

- No. 6 Sqn. - Army Co-op. - Bristol fighters

- No. 8 Sqn. - Army Co-op. - Bristol fighters

- No. 30 Sqn. - Bomber - D.H.9A

Mosul - No. 55 Sqn. - Bomber - D.H.9A

Shaibah - No. 84 Sqn. - Bomber - D.H.9A

India Command - H.Q. Delhi

Ambala - No. 20 Sqn. - Army Co-op. - Bristol fighter

Kohat - No. 28 Sqn. - Army Co-op. - Bristol fighters

Risalpur - No. 27 Sqn. Army Co-op. - Bristol fighters

No. 60 Sqn. - Bomber - D.H.9A

Peshawar - No. 31 Sqn. - Army Co-op. - Bristol fighters

Quetta - No. 5 Sqn. - Army Co-op. - Bristol fighters

THE R.A.F. IN APRIL 1923R.A.F. Coastal Area (Maritime)

- A.H.Q. - 33 to 34 Tavistock Place - London - W.C.1  
 A.O.C. - Air Vice-Marshal A. V. Vyvyan, C.B., D.S.O.  
 S.A.S.O. - Group Captain F. W. Bowhill, C.M.G., D.S.O.

Administered direct from London

- Leuchars Headquarters - C.O. Group Captain P. H. L. Playfair, M.C.  
 (I.E. I.R.)  
 F.A.A. No. 203 Sqn. - Nightjars (6 + 3)  
 F.A.A. No. 205 Sqn. - Panthers (12 + 6)

Novar - emergency airfield used during Fleet firing practices.

- No. 10 Group - H.Q. - Lee-on-Solent.  
 C.O. - Group Captain J. L. Forbes, O.B.E.

Gosport

- F.A.A. - No. 3 Sqn. - Westland Walrus (12 + 6)  
 F.A.A. - No. 210 Sqn. - Torpedo - Darts (12 + 6)

Calshot

- Sea Recce - No. 230 Sqn. - F.5 and F.2A flying boats (5 + 2)

Training and developmentLee-on-Solent

- Observer Training Flight - Fairey III D floatplanes (6 + 6)  
 School of Naval Co-operation

Calshot

- Flying boat pilot Training (F.2A flying boats (2 + 1)  
 (Fairey III D floatplanes (3 + 2)

Gosport - Torpedo Development Flight - Darts (3 + 1)

Isle of Grain - Flying Boat Development - various (6 + 0)

The R.A.F. in the Mediterranean (Maritime)Malta

- Sea Recce - No. 267 Sqn. (F.5 flying boats (5 + 5)  
 (Fairey III D floatplanes (6 + 6)

Pegasus Flight - Fairey III D float planes (4 + 4)

N.B. Starting from May 1923, "Squadrons" were abolished in favour of Flights of six aircraft so as to give more flexibility for naval requirements because it was usually six machines of a type that were embarked in the Carriers.

R.A.F. Inland Area - April 1923

A.H.Q. - Uxbridge.

No. 1 Group - H.Q. Kenley Common, Surrey

Kenley - No. 24 Sqn. - Communications

Hawkinge - No. 56 Sqn. - Fighter - Snipes (one flight at Constantinople)

Eastchurch - Armament and Gunnery School

/No. 11 Wing

No. 11 Wing - H.Q. Spittlegate.

Spittlegate - No. 39 Sqdn. - Bomber - D.H.9A  
 No. 100 Sqdn. - Bomber - Vickers Vimy and D.H.9A

No. 7 Group - H.Q. South Farnborough

South Farnborough - No. 2 Sqdn. - Army Co-op. - Bristol fighters

Andover - No. 11 Sqdn. - Bomber - D.H.9A

Training Schools

No. 1 Flying Training School - Netheravon  
 No. 2 Flying Training School - Duxford  
 No. 5 Flying Training School - Shotwick  
 Central Flying School - Upavon  
 School of Army Co-operation - Old Sarum  
 R.A.F. Staff College - Andover

R.A.F. Overseas Commands - April 1923Egypt and Palestine Command - H.Q. Cairo

Heliopolis - No. 216 Sqdn. - Bomber - Vickers Vimy

Helwan - No. 47 Sqdn. - Bomber - D.H.9A

Ramleh - No. 14 Sqdn. - Army Co-op. Bristol fighters

Abu Sueir - No. 4 Flying Training School

Constantinople Wing

No. 4 Sqdn. - Army Co-op. - Bristol fighters

No. 25 Sqdn. - Fighter - Snipes

No. 56 Sqdn. - Fighter - Snipes (one flight)

No. 207 Sqdn. - Bomber - D.H.9A

No. 208 Sqdn. - Army Co-op. - Bristol fighters

Iraq Command - H.Q. BagdadHinaiidi

No. 1 Sqdn. - Fighter - Snipes

No. 6 Sqdn. - Army Co-op. - Bristol fighters

No. 8 Sqdn. - Army Co-op. - Bristol fighters

No. 30 Sqdn. - Bomber - D.H. 9A

No. 45 Sqdn. - Bomber - Vernons

No. 70 Sqdn. - Bomber - Vickers Vimy

Mosul - No. 55 Sqdn. - Bomber - D.H.9A

Shaibah - No. 84 Sqdn. - Bomber - D.H.9A

R.A.F. India Command - H.Q. Delhi

Ambala - No. 5 Sqdn. - Army Co-op. - Bristol fighters

Kohat - No. 28 Sqdn. - Army Co-op. - Bristol fighters

Risalpur - No. 27 Sqdn. - Army Co-op. - Bristol fighters  
 - No. 60 Sqdn. - Bomber - D.H.9A

Peshawar - No. 31 Sqdn. - Army Co-op. - Bristol fighters

Quetta - No. 20 Sqdn. - Army Co-op. - Bristol fighters

THE R.A.F. IN APRIL 1924R.A.F. Coastal Area (Maritime)

A.H.Q. - 33 to 34 Tavistock Place - London- W.C.1  
 A.O.C. - Air Vice-Marshal Sir Vyell Vyvyan, K.C.B., D.S.O.  
 S.A.S.O. - Group Captain C. F. Kilner, D.S.O.

Leuchars Group - H.Q. at Leuchars

	(I.E. I.R.)	Allocated to
F.A.A. - No.401 Flight - Nightjar fighters	(6 + 3)	- <u>Argus and Hermes</u>
F.A.A. - No.403 Flight - Nightjar fighters	(6 + 3)	- <u>Hermes</u>
F.A.A. - No.404 Flight - Nightjar fighters	(6 + 3)	- <u>Furious</u>
F.A.A. - No.441 Flight - Panther recce.	(6 + 3)	- <u>Hermes</u>
F.A.A. - No.442 Flight - Panther recce.	(6 + 3)	- <u>Argus</u>
F.A.A. - No.443 Flight - Panther recce.	(6 + 3)	- <u>Furious</u>

No. 10 Group - H.Q. Lee-on-SolentGosport

F.A.A. - No. 420 Flight - Westland Walrus Spotters	(6 + 3)	- <u>Furious</u>
F.A.A. - No. 421 Flight - Westland Walrus Spotters	(6 + 3)	- <u>Furious</u>
F.A.A. - No. 423 Flight - Bison spotters	(6 + 3)	- <u>Argus</u>
F.A.A. - No. 460 Flight - Dart torpedo	(6 + 3)	- <u>Furious</u>
F.A.A. - No. 461 Flight - Dart torpedo	(6 + 3)	- <u>Furious</u>

Calshot

Sea Recce - No. 480 Flight - F.5 flying boats (5 + 2)

Training and Development

Lee-on-Solent - Observer Training - Fairey III D floatplanes (6 + 6)  
 School of Naval Co-operation

Calshot

Flying boat Pilot Training	(F.2A flying boats	(2 + 1)
	(Fairey III D floatplanes	(3 + 2)

Gosport

Torpedo Development Flight - Dart torpedo - (3 + 1)

Isle of Grain

Seaplane Development Flight - various - (6 + 0)

Cattewater, Plymouth

Pegasus Development Flight - Fairey III D floatplanes (4 + 4)

The R.A.F. in the Mediterranean (Maritime)A.H.Q. Malta

		Allocated to
F.A.A. - No. 402 Flight - Nightjar fighters	(6 + 6)	<u>Eagle</u>
F.A.A. - No. 422 Flight - Blackburn spotters	(6 + 6)	<u>Eagle</u>
F.A.A. - No. 440 Flight - Seagull III amphibians	(6 + 6)	<u>Eagle</u>
	Spotter Recce.	

Calafra

See Recce - No. 481 Flight - Fairey III D floatplanes (6 + 6)

/R.A.F. Inland Area - April 1924

R.A.F. Inland Area - April 1924

A.H.Q. Uxbridge

No. 1 Group - H.Q. Kenley Common, Surrey

Kenley

No. 24 Sqn. - Communications - Bristol fighters and other types  
No. 32 Sqn. - Fighter - Snipes - (two flights)

Northolt

No. 12 Sqn. - Bomber - D.H.9A (one flight)  
No. 41 Sqn. - Fighter - Siskins III (one flight)

Biggin Hill

No. 56 Sqn. - Fighter - Snipes  
Night Flying Flight

Hawkinge - No. 25 Sqn. - Fighter - Snipes and Grebes

Eastchurch

No. 207 Sqn. - Bomber - D.H.9A  
Armament and Gunnery School

No. 3 Group - H.Q. Spittlegate

Spittlegate

No. 39 Sqn. - Bomber - D.H.9A  
No. 100 Sqn. - Bomber - Fawns (two flights)

Duxford

No. 19 Sqn. - Fighter - Snipes (one flight)  
No. 29 Sqn. - Fighter - Snipes (one flight)  
No. 111 Sqn. - Fighter - Siskins III (one flight)

Martlesham

No. 15 Sqn. - Bomber - D.H.9A (one flight)  
No. 22 Sqn. - Bomber - Experimental types

Bircham Newton

No. 7 Sqn. - Bomber - Vickers Vimy  
No. 11 Sqn. - Bomber - D.H.9A (one flight)

No. 7 Group - H.Q. South Farnborough

South Farnborough - No. 4 Sqn. - Army Co-op. - Bristol fighters.

Andover - No. 2 Sqn. - Army Co-op. Bristol fighters.

Training Schools

No. 1 Flying Training School - Netheravon  
No. 2 Flying Training School - Duxford  
No. 5 Flying Training School - Shotwick  
Central Flying School - Upavon  
School of Army Co-operation - Old Sarum  
R.A.F. Staff College - Andover

/R.A.F. Overseas Commands

R.A.F. Overseas Commands - April 1924

R.A.F. Middle East

Egypt and Palestine Command - H.Q. Cairo

Heliopolis - No. 216 Sqn. - Bomber - Vickers Vimy  
Helwan - No. 47 Sqn. - Bomber - D.H.9A  
Ismailia - No. 208 Sqn. - Army Co-op. - Bristol fighters  
Abu Sueir - No. 4 Flying Training School  
Ramleh - No. 14 Sqn. - Bomber - D.H.9A

Iraq Command - H.Q. Bagdad

Hinaiidi

No. 1 Sqn. - Fighter - Snipes  
No. 6 Sqn. - Army Co-op. - Bristol fighters  
No. 8 Sqn. - Army Co-op. - Bristol fighters  
No. 30 Sqn. - Bomber - D.H.9A  
No. 45 Sqn. - Bomber Transport - Vernons  
No. 70 Sqn. - Bomber Transport - Vernons and Vickers Vimy

Mosul - No. 55 Sqn. - Bomber - D.H.9A

Shaibah - No. 84 Sqn. - Bomber - D.H.9A

R.A.F. India - H.Q. Delhi

Ambala - No. 5 Sqn. - Army Co-op. - Bristol fighters

Risalpur - No. 27 Sqn. - Army Co-op. - Bristol fighters  
No. 60 Sqn. - Bomber - D.H.9A

Dardoni - No. 31 Sqn. - Army Co-op. - Bristol fighters

Peshawar - No. 28 Sqn. - Army Co-op. - Bristol fighters

Quetta - No. 20 Sqn. - Army Co-op. - Bristol fighters

/THE R.A.F. IN APRIL 1926

THE R.A.F. IN APRIL 1926R.A.F. Coastal Area (Maritime)

A.H.Q. - 33-34 Tavistock Place, W.C.1  
 A.O.C. - Air Vice-Marshal F. R. Scarlett, C.B., D.S.O.  
 S.A.S.O. - Group Captain P. H. L. Playfair, M.C.

Leuchars Group - H.Q. at LeucharsLeuchars

	(I.E.)	
F.A.A. - No. 404 Flight - Flycatchers	(6)	
F.A.A. - No. 442 Flight - Fairey III D	(6)	R.A.F. complement
F.A.A. - No. 443 Flight - Fairey III D	(6)	

Donibristle

in

F.A.A. - No. 401 Flight - Flycatchers	(6)	
F.A.A. - No. 405 Flight - Flycatchers	(6)	H.M. Carrier <u>Furious</u>
F.A.A. - No. 406 Flight - Flycatchers	(6)	

No. 10 Group - H.Q. at Lee-on-SolentGosport

F.A.A. - No. 420 Flight - Blackburns	(6)
F.A.A. - No. 421 Flight - Bisons	(6)
F.A.A. - No. 423 Flight - Bisons	(6)
F.A.A. - No. 461 Flight - Darts	(6)
F.A.A. - No. 426 Flight - Darts	(6)

Calshot

Coastal Recce. - No. 480 Flight - Southampton flying boats (4 I.E.)

Training and DevelopmentLee-on-Solent

F.A.A. No. 444 Flight - Fairey III D (6)  
 School of Naval Co-operation

Calshot

Seaplane Training and Air Pilotage Flights

Gosport

Torpedo Development Flight

Felixstowe

Flying Boat Development Flight

R.A.F. in Mediterranean (Maritime)Malta - Calafra

Coastal Recce. - No. 481 Flight - Fairey III D floatplanes	(6 I.E.)	
F.A.A. - No. 402 Flight - Flycatchers	(6)	R.A.F. complements in
F.A.A. - No. 403 Flight - Flycatchers	(6)	
F.A.A. - No. 422 Flight - Blackburns	(6)	H.M. Carrier <u>Eagle</u>
F.A.A. - No. 440 Flight - Fairey III D	(6)	
F.A.A. - No. 441 Flight - Fairey III D	(6)	
F.A.A. - No. 460 Flight - Darts	(6)	and <u>Hermes</u>

/R.A.F. Inland Area - April 1926(1)

R.A.F. Inland Area - April 1926<sup>(1)</sup>

A.H.Q. - Uxbridge

A.O.C. - Air Marshal Sir John M. Salmond, K.C.B., C.M.G., C.V.O., D.S.O.

No. 1 Group - H.Q. Kidbrooke

Manston

No. 2 Sqdn. - Army Co-op. - Bristol fighters

No. 9 Sqdn. - Bomber - Virginias and some Vickers Vimy

Eastchurch

No. 207 Sqdn. - Bomber - D.H.9A

Armament and Gunnery School

No. 3 Group - H.Q. Spittlegate

Spittlegate

No. 39 Sqdn. - Bomber - D.H.9A

No. 100 Sqdn. - Bomber - Fawns

Martlesham

No. 15 Sqdn. - Bomber - D.H.9A

No. 22 Sqdn. - Experimental and New types

Aeroplane and Armament Experimental Establishment

Bircham Newton

No. 7 Sqdn. - Bomber - Virginias

No. 99 Sqdn. - Bomber - Aldershots

No. 6 Group - H.Q. Kenley

Kenley

No. 24 Sqdn. - Communications - Bristol fighters and other types

No. 32 Sqdn. - Fighter - Grebes

Biggin Hill

No. 56 Sqdn. - Fighter - Grebes

Night Flying Flight

/Northolt

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(1) In May 1926 the bulk of the Inland Area was renamed "The Air Defence of Great Britain" with a Wessex Bombing Area and a Fighter Area.

No. 6 Group - H.Q. Kenley (contd.)

Northolt

No. 41 Sqn. - Fighter - Siskins III

Hawkinge

No. 17 Sqn. - Fighter - Snipes

No. 25 Sqn. - Fighter - Grebes

Duxford

No. 19 Sqn. - Fighter - Snipes

No. 29 Sqn. - Fighter - Grebes

No. 111 Sqn. - Fighter - Siskins III

Henlow

No. 23 Sqn. - Fighter - Gamecocks

No. 43 Sqn. - Fighter - Snipes

No. 7 Group - H.Q. Andover

South Farnborough - No. 4 Sqn. - Army Co-op. - Bristol fighters

Netheravon - No. 11 Sqn. - Bomber - Fawns

Old Sarum - No. 16 Sqn. - Army Co-op. - Bristol fighters

Upavon - No. 3 Sqn. - Fighter - Woodcocks

Worthy Down - No. 58 Sqn. - Bomber - Virginias

Andover - No. 12 Sqn. - Bomber - Fawns  
- No. 13 Sqn. - Army Co-op. - Bristol fighters

Auxiliary Air Force

Aldeergrove - No. 502 (Ulster) Sqn. - Bomber - Vickers Vimy

Northolt - No. 600 (London) Sqn. - Bomber - D.H.9A  
- No. 600 (London) Sqn. - Bomber - D.H.9A

Renfrew - No. 602 (Glasgow) Sqn. - Bomber - D.H.9A

Turnhouse - No. 603 (Edinburgh) Sqn. - Bomber - D.H.9A

Training Schools

No. 1 Flying Training School - Netheravon  
No. 2 Flying Training School - Digby  
No. 5 Flying Training School - Sealand  
Central Flying School - Upavon  
School of Army Co-operation - Old Sarum  
R.A.F. Staff College - Andover

Overseas Commands - April 1926

R.A.F. Middle East - H.Q. Cairo

Egyptian Group

- Heliopolis - No. 216 Sqn. - Bomber Transport - Victorias
- Moascar - No. 208 Sqn. - Army Co-op. - Bristol fighters
- Helwan - No. 47 Sqn. - Bomber - D.H.9A
- Abu Sueir - No. 4 Flying Training School

Palestine Command

- Ramleh - No. 14 Sqn. - Bomber - D.H.9A

Iraq Command - H.Q. Bagdad

Hinaidi

- No. 1 Sqn. - Fighter - Snipes
- No. 8 Sqn. - Bomber - D.H.9A
- No. 30 Sqn. - Bomber - D.H.9A
- No. 45 Sqn. - Bomber Transport - Vernons and D.H.9A
- No. 55 Sqn. - Bomber - D.H.9A
- No. 70 Sqn. - Bomber Transport - Vernons and Vickers Vimy

- Mosul - No. 6 Sqn. - Army Co-op. - Bristol fighters

- Shaibah - No. 84 Sqn. - Bomber - D.H.9A

R.A.F. India - H.Q. Delhi

- Ambala - No. 31 Sqn. - Army Co-op. - Bristol fighters

- Kohat - No. 60 Sqn. - Bomber - D.H.9A

- Peshawar - No. 20 Sqn. - Army Co-op. - Bristol fighters

- Quetta - No. 28 Sqn. - Army Co-op. - Bristol fighters

- Risalpur - No. 5 Sqn. - Army Co-op. - Bristol fighters
- No. 27 Sqn. - Bomber - D.H.9A

/THE R.A.F. IN JANUARY 1929

THE R.A.F. IN JANUARY 1929

R.A.F. Coastal Area (Maritime)

- A.H.Q. - 33-34 Tavistock Place - London, W.C.1.
- A.O.C. - Air Vice-Marshal C. L. Lambe, C.B., C.M.G., D.S.O.
- S.A.S.O. - Group Captain A. W. Bigsworth, C.M.G., D.S.O., A.F.C.

Leuchars - H.Q. and Training Base

Donibristle

- Coastal - No. 36 Sqn. - Torpedo Bombers - Horsleys - (12 I.E.)
- F.A.A. - No. 406 Flight - Flycatchers (6)

Plymouth - Cattewater

- Coastal Recce. - No. 203 Sqn. - Southampton flying boats (4 I.E.)

Flights in Home based Carriers

- |                                 |     |   |                          |
|---------------------------------|-----|---|--------------------------|
| F.A.A. - No. 401 - Flycatchers  | (6) | } | H.M.S. <u>Argus</u>      |
| F.A.A. - No. 422 - Blackburns   | (6) |   |                          |
| F.A.A. - No. 441 - Fairey III D | (6) |   |                          |
| F.A.A. - No. 405 - Flycatchers  | (6) | } | H.M.S. <u>Furious</u>    |
| F.A.A. - No. 420 - Blackburns   | (6) |   |                          |
| F.A.A. - No. 421 - Bisons       | (6) |   |                          |
| F.A.A. - No. 443 - Fairey III F | (6) |   |                          |
| F.A.A. - No. 461 - Darts        | (6) |   |                          |
| F.A.A. - No. 462 - Darts        | (6) |   |                          |
| F.A.A. - No. 444 - Fairey III D | (6) | ) | H.M.S. <u>Vindictive</u> |

No. 10 Group - H.Q. Lee-on-Solent

Calshot

- Coastal Recce. - No. 201 Sqn. - Southampton flying boats (4 I.E.)

Training and Development

Lee-on-Solent - School of Naval Co-operation

Calshot

- Seaplane Training Flight
- H.Q. Training Squadron
- Navigation School

Gosport - Torpedo Development Section

Felixstowe - Flying boat Development Flight

R.A.F. in Mediterranean (Maritime)

- A.H.Q. - Malta
- A.O.C. - Air Commodore R. H. Clark-Hall, C.M.G., D.S.O.

Calafrena

- Coastal Recce. - No. 202 Sqn. - Fairey III D floatplanes (12 I.E.)

Flights in Mediterranean

Flights in Mediterranean Fleet Carriers

F.A.A. - No. 404 - Flycatchers	(6)	}	H.M.S. <u>Courageous</u>
F.A.A. - No. 407 - Flycatchers	(6)		
F.A.A. - No. 445 - Fairey III F	(6)		
F.A.A. - No. 446 - Fairey III F	(6)		
F.A.A. - No. 463 - Darts	(6)		
F.A.A. - No. 464 - Darts	(6)	}	H.M.S. <u>Eagle</u>
F.A.A. - No. 402 - Flycatchers	(6)		
F.A.A. - No. 423 - Bisons	(6)		
F.A.A. - No. 460 - Darts	(6)		

R.A.F. in China (Maritime)Hong Kong

F.A.A. - No. 442 Flight - Fairey III D	(6)	}	H.M.S. <u>Hermes</u>
F.A.A. - No. 403 Flight - Flycatchers	(6)		
F.A.A. - No. 440 Flight - Fairey III F	(6)		

R.A.F. in Malay (Maritime)

Singapore - Far East Recce Flight - Southampton flying boats (4)

Air Defence of Great Britain (ADGB) - January 1929

A.H.Q. - Hillingdon House - Uxbridge

A.O.C. - Air Marshal Sir John M. Salmond K.C.B., C.M.G., C.V.O., D.S.O.

Wessex Bombing Area - H.Q. - Andover

Andover

No. 12 Sqn. - Bomber - Foxes  
R.A.F. Staff College

Bicester

No. 100 Sqn. - Bomber - Horsleys

Worthy Down

No. 7 Sqn. - Bomber - Virginias  
No. 58 Sqn. - Bomber - Virginias

Netheravon

No. 11 Sqn. - Bomber - Horsleys - en route to India

Bircham Newton

No. 39 Sqn. - Bomber - D.H.9A - en route to India  
No. 101 Sqn. - Bomber - Sidestrands

Manston

No. 9 Sqn. - Bomber - Virginias

Upper Heyford

No. 10 Sqn. - Bomber - Hyderabad  
No. 99 Sqn. - Bomber - Hyderabad

Eastchurch

No. 207 Sqn. - Bomber - Fairey III F

Fighter Area -

Fighter Area - H.Q. Uxbridge

Kenley

- No. 23 Sqn. - Fighter - Gamecocks
- No. 32 Sqn. - Fighter - Siskins III

Northolt

- No. 24 Sqn. - Communications - Avro, Moth and Bristol fighters
- No. 41 Sqn. - Fighters - Siskins III

Hawkinge

- No. 25 Sqn. - Fighter - Siskins III

Upavon

- No. 3 Sqn. - Fighter - Woodcocks
- No. 17 Sqn. - Fighter - Woodcocks

Duxford

- No. 19 Sqn. - Fighter - Siskins III

North Weald

- No. 29 Sqn. - Fighter - Siskins III
- No. 56 Sqn. - Fighter - Siskins III

Tangmere

- No. 1 Sqn. - Fighter - Siskins III
- No. 43 Sqn. - Fighter - Siskins III

Biggin Hill

- Night Flying Flight - Horsleys and Bristol fighters

Hornchurch

- No. 111 Sqn. - Fighter - Siskins III

No. 1 Air Defence Group - H.Q. - Sloane Square - London - S.W.1.

Aldergrove - No. 502 (Ulster) Sqn. - Bomber - Hyderabad

Waddington - No. 503 (Lincoln) Sqn. - Bomber - Fawns

Hucknall - No. 504 (Nottingham) Sqn. - Bomber - No aircraft yet

Hendon - No. 600 (London) Sqn. - Bomber - D.H.9A  
No. 601 (London) Sqn. - Bomber - D.H.9A

Turnhouse - No. 603 (Edinburgh) Sqn. - Bomber - D.H.9A

Renfrew - No. 602 (Glasgow) Sqn. - Bomber - Fawns

Castle Bromwich - No. 605 (Warwick) Sqn. - Bomber - D.H.9A

/Inland Area -

Inland Area - January 1929

A.H.Q. - Bentley Priory - Stanmore - Middx.

A.O.C. - Air Vice-Marshal C.A.H. Longcroft, C.B., C.M.G., D.S.O., A.F.C.

No. 21 Group - H.Q. West Drayton

Martlesham

No. 15 Sqn. - Bomber - Horsleys  
No. 22 Sqn. - Bomber - Experimental and new types  
Aeroplane and Armament Experimental Establishment

No. 22 Group - H.Q. South Farnborough

South Farnborough

No. 4 Sqn. - Army Co-op - Bristol fighters

Andover

No. 13 Sqn. - Army Co-op - Atlas

Catterick

No. 26 Sqn. - Army Co-op - Atlas

Manston

No. 2 Sqn. - Army Co-op - Bristol fighters

Old Sarum

No. 16 Sqn. - Army Co-op - Bristol fighters

School of Army Co-operation

No. 23 Group - H.Q. "St. Vincents", Grantham

No. 1 Flying Training School - Netheravon

No. 2 Flying Training School - Digby

No. 3 Flying Training School - Grantham

No. 5 Flying Training School - Sealand

Central Flying School - Wittering

Armament and Gunnery School - Eastchurch

/Overseas Commands -

Overseas Commands - January 1929

R.A.F. Middle East - H.Q. Villa Victoria, Cairo

Egyptian Group

Heliopolis - No. 208 Sqn. - Army Co-op - Bristol fighters

No. 216 Sqn. - Bomber Transport - Victorias

Helwan - No. 45 Sqn. - Bomber - D.H.9A

Khartoum - No. 47 Sqn. - Bomber - Fairey III F

Amnan - No. 14 Sqn. - Bomber - D.H.9A

Abu Sueir - No. 4 Flying Training School

Aden, Khormaksar - No. 8 Sqn. - Bombers - Fairey III F

Iraq Command - H.Q. Bagdad

Hinaidi - No. 30 Sqn. - Bomber - D.H.9A

No. 55 Sqn. - Bomber - D.H.9A

No. 70 Sqn. - Bomber Transport - Victorias

Shaibah - No. 84 Sqn. - Bomber - Wapiti

Mosul - No. 6 Sqn. - Army Co-op - Bristol fighters

R.A.F. India - H.Q. - New Delhi

Ambala

No. 28 Sqn. - Army Co-op - Bristol fighters

Kohat

No. 27 Sqn. - Bomber - D.H.9A

No. 60 Sqn. - Bomber - D.H.9A

Risalpur

No. 11 Sqn. }  
No. 39 Sqn. } en route from U.K.

Quetta

No. 5 Sqn. - Army Co-op - Bristol fighters

No. 31 Sqn. - Army Co-op - Bristol fighters

Peshawar

No. 20 Sqn. - Army Co-op - Bristol fighters

THE R.A.F. IN MAY 1931R.A.F. Coastal Area (Maritime)

A.H.Q. - 33-34 Tavistock Place - London - W.C.1  
 A.O.C. - Air Vice-Marshal C. L. Lambe, C.B., C.M.G., D.S.O.  
 S.A.S.O. - Group Captain G. R. Bromet, D.S.O., O.B.E.

Leuchars - H.Q. and Training Base.

Donibristle - Coastal - No. 100 Sqdn. - Torpedo Bombers - Horsleys  
 (12 I.E.)

Felixstowe - Coastal Recce. - No. 210 Sqdn. - no flying boats as yet

Mount Batten, Plymouth

Coastal Recce. - No. 204 Sqdn. - Southampton flying boats (4 I.E.)

Coastal Recce. - No. 209 Sqdn. - Iris III flying boats (4 I.E.)

Flights in H.M.S. Courageous

F.A.A. - No. 401 - Flycatchers	(6)
F.A.A. - No. 404 - Flycatchers	(6)
* F.A.A. - No. 407 - Flycatchers	(6)
F.A.A. - No. 445 - Fairey III F	(6)
F.A.A. - No. 446 - Fairey III F	(6)
F.A.A. - No. 449 - Fairey III F	(6)
F.A.A. - No. 450 - Fairey III F	(6)
F.A.A. - No. 463 - Darts	(6)
F.A.A. - No. 464 - Darts	(6)

\* Catapult flights. The use of catapult launching from Capital ships and cruisers started in 1930.

No. 10 Group - H.Q. Lee-on-SolentLee-on-Solent

\* F.A.A. - No. 444 Flight - Fairey III D (6)  
 \* F.A.A. - No. 443 Flight - Fairey III F (6)

Gosport

F.A.A. - No. 442 Flight - Fairey III F (6)  
 F.A.A. - No. 465 Flight - Ripons (6)  
 F.A.A. - No. 466 Flight - Ripons (6)

Calshot

Coastal Recce. - No. 201 Sqdn. - Southampton flying boats (4 I.E.)

Training and Development

Lee-on-Solent - School of Naval Co-operation

Calshot - H.Q. Training Squadron and Seaplane Training Flight  
 - Navigation School

Gosport - Torpedo Development Section

Felixstowe - Flying Boat Development Flight

R.A.F. in Mediterranean (Maritime) - May 1931

A.H.Q. - Malta

A.O.C. - Air Commodore J. L. Forbes, O.B.E.

Calafra

Coastal Recce. - No. 202 Sqdn. - Fairey III D and III F floatplanes (12 I.E.)

Flights in Mediterranean Fleet Carriers

- |                                   |     |                          |
|-----------------------------------|-----|--------------------------|
| * F.A.A. - No. 405 - Flycatchers  | (6) | } H.M.S. <u>Glorious</u> |
| * F.A.A. - No. 406 - Flycatchers  | (6) |                          |
| F.A.A. - No. 408 - Flycatchers    | (6) |                          |
| F.A.A. - No. 441 - Fairey III F   | (6) |                          |
| * F.A.A. - No. 447 - Fairey III F | (6) |                          |
| F.A.A. - No. 461 - Ripons         | (6) |                          |
| F.A.A. - No. 462 - Ripons         | (6) |                          |
|                                   |     |                          |
| F.A.A. - No. 402 - Flycatchers    | (6) | } H.M.S. <u>Eagle</u>    |
| F.A.A. - No. 448 - Fairey III F   | (6) |                          |
| F.A.A. p No. 460 - Ripons         | (6) |                          |

\* Catapult Flights.

R.A.F. Iraq Command (Maritime Section)

Basrah - No. 203 Sqdn. - Rangoon flying boats (4 I.E.)

R.A.F. Far East (Maritime)

Singapore

No. 205 Sqdn. - Southampton flying boats (4 I.E.)

No. 36 Sqdn. - Torpedo Bombers - Horsleys (12 I.E.)

- |  |     |                        |
|--|-----|------------------------|
| F.A.A. - No. 403 Flight - Flycatchers  | (6) | } H.M.S. <u>Hermes</u> |
| F.A.A. - No. 440 Flight - Fairey III F | (6) |                        |

Air Defence of Great Britain (ADGB) - May 1931

A.H.Q. - Hillingdon House, Uxbridge

A.O.C. - Air Marshal Sir Edward L. Ellington, K.C.B., C.M.G., C.B.E.

Wessex Bombing Area - H.Q. Andover

Andover

- No. 12 Sqdn. - Bombers - Harts
- No. 101 Sqdn. - Bombers - Sidestrands
- R.A.F. Staff College

Bicester

No. 33 Sqdn. - Bombers - Harts

Bircham Newton

No. 35 Sqn. - Bombers - Fairey III F  
No. 207 Sqn. - Bombers - Fairey III F

Boscombe Down

No. 9 Sqn. - Bombers - Virginias  
No. 10 Sqn. - Bombers - Hinaidis

Upper Heyford

No. 40 Sqn. - Bombers - Gordons  
No. 99 Sqn. - Bombers - Hinaidis

Worthy Down

No. 7 Sqn. - Bombers - Virginias  
No. 58 Sqn. - Bombers - Virginias

Fighter Area - H.Q. Uxbridge

Duxford

No. 19 Sqn. - Fighters - Siskins III

Hawkinge

No. 25 Sqn. - Fighters - Siskins III

Hornchurch

No. 54 Sqn. - Fighters - Bulldogs  
No. 111 Sqn. - Fighters - Bulldogs

Kenley

\* No. 23 Sqn. - Fighters - Gamecocks  
No. 32 Sqn. - Fighters - Bulldogs

Northolt

No. 24 Sqn. - Communications - Avros, Moth and  
Fairey III F  
No. 41 Sqn. - Fighters - Siskins III

North Weald

No. 29 Sqn. - Fighters - Siskins III  
No. 56 Sqn. - Fighters - Siskins III

Tangmere

No. 1 Sqn. - Fighters - Siskins III  
No. 43 Sqn. - Fighters - Siskins III

Upavon

No. 3 Sqn. - Fighters - Bulldogs  
No. 17 Sqn. - Fighters - Bulldogs

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\* Douglas Bader joined this squadron and lost both of his legs in a flying accident on 14.12.31 at Woodley aerodrome, near Reading.

May 1951

No. 1 Air Defence Group - H.Q. - Sloane Square - London - S.W.1

Manston - No. 500 (Kent) Sqdn. - Bombers - Virginias

Filton - No. 501 (Bristol) Sqdn. - Bombers - Wapiti

Aldergrove - No. 502 (Ulster) Sqdn. - Bombers - Hyderabad

Waddington - No. 503 (Lincoln) Sqdn. - Bombers - Hyderabad

Hucknall - No. 504 (Nottingham) Sqdn. - Bombers - Horsleys

Hendon - No. 600 (London) Sqdn. - Bombers - Wapiti  
No. 601 (London) Sqdn. - Bombers - Wapiti

Renfrew - No. 602 (Glasgow) Sqdn. - Bombers - Wapiti

Turnhouse - No. 603 (Edinburgh) Sqdn. - Bombers - Wapiti

Hendon - No. 604 (Middlesex) Sqdn. - Bombers - Wapiti

Castle Bromwich - No. 605 (Warwick) Sqdn. - Bombers - Wapiti

Usworth - No. 605 (Durham) Sqdn. - Bombers - Avros only as yet

Thornaby - No. 608 (North Riding) Sqdn. - Bombers - Wapiti

Inland Area

A.H.Q. - Bentley Priory, Stanmore, Middlesex

A.O.C. - Air Vice-Marshal A. E. Bolton, C.B., C.M.G., D.S.O., A.F.C.

No. 21 Group - H.Q. West Drayton

Martlesham

No. 15 Sqdn. - Bomber - Experimental types

No. 22 Sqdn. - Bomber - Experimental types

Aeroplane and Armament Experimental Establishment

No. 22 Group - H.Q. South Farnborough

Manston - No. 2 Sqdn. - Army Co-op. - Atlas

South Farnborough - No. 4 Sqdn. - Army Co-op. - Atlas

Netheravon - No. 13 Sqdn. - Army Co-op. - Atlas

Catterick - No. 26 Sqdn. - Army Co-op. - Atlas

Old Sarum - No. 16 Sqdn. - Army Co-op. - Atlas  
- School of Army Co-operation

No. 23 Group - H.Q. "St. Vincents", Grantham

No. 2 Flying Training School - Digby  
No. 3 Flying Training School - Grantham  
No. 5 Flying Training School - Sealand  
Central Flying School - Wittering  
Armament and Gunnery School - Eastchurch  
R.A.F. Practice Camps at Catfoss, Sutton Bridge and North Coates  
Fitties

Overseas Commands - May 1931

R.A.F. Middle East - H.Q. Villa Victoria, Cairo

Heliopolis

No. 208 Sqdn. - Army Co-op. - Atlas

No. 216 Sqdn. - Bomber Transport - Victorias

Helwan - No. 45 Sqdn. - Bombers - Fairey III F

Ismailia - No. 6 Sqdn. - Army Co-op. - Bristol fighters

Khartoum - No. 47 Sqdn. - Bombers - Fairey III F

Amman - No. 14 Sqdn. - Bombers - Fairey III F

Abu Sueir - No. 4 Flying Training School

Aden - No. 8 Sqdn. - Bombers - Fairey III F

Iraq Command - H.Q. - Hinaidi

Hinaidi

No. 55 Sqdn. - Bombers - Wapiti

No. 70 Sqdn. - Bomber Transport - Victorias

Mosul - No. 30 Sqdn. - Bombers - Wapiti

Shaibah - No. 84 Sqdn. - Bombers - Wapiti

R.A.F. India - H.Q. Simla

Ambala - No. 28 Sqdn. - Army Co-op - Bristol fighters

Kohat - No. 27 Sqdn. - Bombers - Wapiti

No. 60 Sqdn. - Bombers - Wapiti

Risalpur - No. 11 Sqdn. - Bombers - Wapiti

- No. 39 Sqdn. - Bombers - Wapiti

Peshawar - No. 20 Sqdn. - Army Co-op - Wapiti

Quetta - No. 5 Sqdn. - Army Co-op - Wapiti

- No. 31 Sqdn. - Army Co-op - Bristol fighters

THE R.A.F. IN JUNE 1933

R.A.F. Coastal Area (Maritime)

A.H.Q. - Lee-on-Solent, Hants (1)

A.O.C. - Air Vice-Marshal R. H. Clark-Hall, C.M.G., D.S.O.

S.A.S.O. - Air Commodore N. J. Gill, C.B.E., M.C.

Leuchars - H.Q. and Training Base

Donibristle - Coastal - No. 100 Sqn. - Torpedo Bombers -  
Vildebeest (12 I.E.)

Calshot - Coastal Recce. - No. 201 Sqn. - Southampton flying  
boats (4 I.E.)

Mount Batten - Coastal Recce. - No. 204 Sqn. - Southampton  
flying boats (4 I.E.)  
Coastal Recce. - No. 209 Sqn. - Iris V flying  
boats (4 I.E.)

Pembroke Dock - Coastal Recce. - No. 210 Sqn. - Southampton  
flying boats (4 I.E.)

Fleet Air Arm Squadrons\* and Flights in Home based Carriers

H.M.S. Courageous

- No. 800 Sqn. - Nimrods and Ospreys (12)
- No. 810 Sqn. - Darts (12)
- No. 820 Sqn. - Fairey III F (12)
- No. 821 Sqn. - Seals (12)

H.M.S. Furious

- No. 801 Sqn. - Flycatchers and Nimrods (12)
- No. 811 Sqn. - Ripons (12)
- No. 822 Sqn. - Fairey III F (12)

\* In June 1933, Squadrons were formed of two Flights each.

Catapult Flights in capital ships and cruisers

- No. 406 - Flycatchers (6) - for 4th Cruiser Squadron in East Indies
- No. 407 - Ospreys (6) - for 2nd Cruiser Squadron in Home Fleet
- No. 443 - Fairey III F (6) - for 6th and 8th Cruiser Squadrons in  
America and West Indies, and South Africa stations
- No. 444 - Fairey III F (6) for 2nd Battle Squadron in Home Fleet

Training and Development

Lee-on-Solent - School of Naval Co-operation  
Training and Co-operation Flights

Calshot - Navigation School  
Training Squadron

Gosport - Torpedo Section Base  
Torpedo Training Squadron  
Coast Defence Training Flight

(1) The transfer of the A.H.Q. from London to Lee-on-Solent took place on 18 January 1932 and involved the disappearance of No. 10 Group.

R.A.F. Mediterranean (Maritime)

A.H.Q. Valetta, Malta.

A.O.C. Air Commodore C.E.H. Rathborne, D.S.O.

Calafrana

Coastal Recce. - No. 202 Sqdn. - Fairey III F floatplanes  
(12 I.E.)

Fleet Air Arm Squadrons in Carrier H.M.S. Glorious

No. 802 Sqdn. - Nimrods and Ospreys (12)

No. 812 Sqdn. - Ripons (12)

No. 823 Sqdn. - Fairey III F (12)

Catapult Flight No. 447 - Fairey III F (6) in 1st Cruiser Squadron

R.A.F. Iraq Command (Maritime Section)

Basrah - No. 203 Sqdn. - Rangoon flying boats (4 I.E.)

R.A.F. Far East (Maritime)

Singapore

No. 205 Sqdn. - Southampton flying boats (4 I.E.)

No. 36 Sqdn. - Torpedo Bombers - Horsleys (12 I.E.)

F.A.A. - No. 803 Sqdn. - Ospreys (12)

F.A.A. - No. 824 Sqdn. - Fairey III F (12)

} H.M.S. Eagle

F.A.A. Catapult Flight No. 403 - Flycatchers (6) in 5th Cruiser Squadron.

Air Defence of Great Britain (ADGB) - June 1933

A.H.Q. - Hillingdon House, Uxbridge

A.O.C.-in-C. Air Marshal Sir Robert Brooke-Popham, K.C.B., C.M.G.,  
D.S.O., A.F.C.

S.A.S.O. - Air Commodore E. L. Gossage D.S.O.

Wessex Bombing Area - H.Q. Andover

Abingdon - No. 40 Sqdn. - Bomber - Gordons

Andover - No. 12 Sqdn. - Bomber - Harts

No. 101 Sqdn. - Bomber - Sidestrands

R.A.F. Staff College

Bicester - No. 33 Sqdn. - Bomber - Harts

Bircham Newton - No. 35 Sqn. - Bomber - Gordons  
- No. 207 Sqn. - Bomber - Gordons

Boscombe Down - No. 9 Sqn. - Bomber - Virginias  
- No. 10 Sqn. - Bomber - Virginias

Upper Heyford - No. 18 Sqn. - Bomber - Harts  
- No. 57 Sqn. - Bomber - Harts  
- No. 99 Sqn. - Bomber - Hinaidis

Worthy Down - No. 7 Sqn. - Bomber - Virginias  
No. 58 Sqn. - Bomber - Virginias

Fighter Area - H.Q. Uxbridge

Biggin Hill - No. 23 Sqn. - Fighter - Demons  
- No. 32 Sqn. - Fighter - Bulldogs

Duxford - No. 19 Sqn. - Fighter - Bulldogs

Hawkinge - No. 25 Sqn. - Fighter - Furies

Hornchurch - No. 54 Sqn. - Fighter - Bulldogs  
- No. 111 Sqn. - Fighter - Bulldogs

Northolt - No. 24 Sqn. - Communications - Avros, Moth and  
Fairey III F  
- No. 41 Sqn. - Fighter - Bulldogs

North Weald - No. 29 Sqn. - Fighter - Bulldogs  
No. 56 Sqn. - Fighter - Bulldogs

Tangmere - No. 1 Sqn. - Fighter - Furies  
No. 43 Sqn. - Fighter - Furies

Upavon - No. 3 Sqn. - Fighter - Bulldogs  
- No. 17 Sqn. - Fighter - Bulldogs

No. 1 Air Defence Group - June 1933

A.H.Q. - 33-34 Tavistock Place - London - W.C.1.

Manston - No. 500 (Kent) Sqn. - Bomber - Virginias

Filton - No. 501 (Bristol) Sqn. - Bomber - Wallaces

Aldergrove - No. 502 (Ulster) Sqn. - Bomber - Virginias

Waddington - No. 503 (Lincoln) Sqn. - Bomber - Hyderabadas

Hucknall - No. 504 (Nottingham) Sqdn. - Bomber - Horsleys  
Hendon - No. 600 (London) Sqdn. - Bomber - Harts  
 No. 601 (London) Sqdn. - Bomber - Harts  
 No. 604 (Middlesex) Sqdn. - Bomber - Wapiti  
Abbotsinch - No. 602 (Glasgow) Sqdn. - Bomber - Wapiti  
Turnhouse - No. 603 (Edinburgh) Sqdn. - Bomber - Wapiti  
Castle Bromwich - No. 605 (Warwick) Sqdn. - Bomber - Wapiti  
Usworth - No. 607 (Durham) Sqdn. - Bomber - Wapiti  
Thornaby - No. 608 (North Riding) Sqdn. - Bomber - Wapiti

Inland Area

A.H.Q. - Bentley Priory, Stanmore, Middx.

A.O.C. - Air Vice-Marshal A. M. Longmore, C.B., D.S.O.

No. 21 Group - H.Q. West Drayton

Martlesham - No. 15 Sqdn. - Bombers - Experimental types

No. 22 Sqdn. - Bombers - Experimental types

Aeroplane and Armament Experimental Establishment

No. 22 Group - H.Q. - South Farnborough

Manston - No. 2 Sqdn. - Army Co-op. - Atlas

South Farnborough - No. 4 Sqdn. - Army Co-op. - Audax

Netheravon - No. 13 Sqdn. - Army Co-op. - Audax

Catterick - No. 26 Sqdn. - Army Co-op. - Atlas

Old Sarum - No. 16 Sqdn. - Army Co-op. - Atlas

School of Army Co-operation

No. 23 Group - H.Q. Grantham

No. 2 Flying Training School - Digby

No. 3 Flying Training School - Grantham

No. 5 Flying Training School - Sealand

Central Flying School - Wittering

Air Armament School - H.Q. Eastchurch

No. 1 Armament Training Camp - Catfoss

No. 2 Armament Training Camp - North Coates

No. 3 Armament Training Camp - Sutton Bridge

Overseas Commands - June 1933

R.A.F. Middle East - H.Q. - Villa Victoria, Cairo

Heliopolis

No. 208 Sqn. - Army Co-op. - Atlas

No. 216 Sqn. - Bomber Transport - Victorias

Helwan - No. 45 Sqn. - Bomber - Fairey III F (G.P.)

Khartoum - No. 47 Sqn. - Bomber - Gordons

Amman - No. 14 Sqn. - Bomber - Gordons

Ismailia - No. 6 Sqn. - Bomber - Gordons

Abu Sueir - No. 4 Flying Training School

Aden - No. 8 Sqn. - Bomber - Fairey III F (G.P.)

Iraq Command - H.Q. Hinaidi

Hinaidi - No. 55 Sqn. - Bomber - Wapiti

- No. 70 Sqn. - Bomber Transport - Victorias

Mosul - No. 30 Sqn. - Bomber - Wapiti

Shaibah - No. 84 Sqn. - Bomber - Wapiti

R.A.F. India - H.Q. Simla

Ambala - No. 28 Sqn. - Army Co-op. - Wapiti

Kohat - No. 27 Sqn. - Bomber - Wapiti

- No. 60 Sqn. - Bomber - Wapiti

Risalpur - No. 11 Sqn. - Bomber - Harts

- No. 39 Sqn. - Bomber - Harts

Quetta - No. 5 Sqn. - Army Co-op. - Wapiti

- No. 31 Sqn. - Army Co-op. - Wapiti

Peshawar - No. 20 Sqn. - Army Co-op. - Wapiti

/THE R.A.F. IN JUNE 1935

THE R.A.F. IN JUNE 1935

R.A.F. Coastal Area (Maritime)

- A.H.Q. - Lee-on-Solent, Hants.
- A.O.C. - Air Marshal A. M. Longmore, C.B., D.S.O.
- S.A.S.O. - Air Commodore N. J. Gill, C.B.E., M.C.

Donibristle

Coastal - No. 22 Sqn. - Torpedo Bomber - Vildebeest (12 I.E.)

Felixstowe

Coastal Recce. - No. 209 Sqn. - Short, London and Southampton flying boats (6 I.E.)

Calshot

Coastal Recce. - No. 201 Sqn. - Southampton flying boats (6 I.E.)

Mount Batten

Coastal Recce. - No. 204 Sqn. - Southampton flying boats (6 I.E.)

Pembroke Dock

Coastal Recce. - No. 210 Sqn. - Singapore III flying boats (6 I.E.)

Coastal Recce. - No. 230 Sqn. - Singapore III flying boats (6 I.E.)

Fleet Air Arm Squadrons and Flights in Home Waters

H.M.S. Courageous

H.M.S. Furious

- |   |   |
|---|---|
| No. 800 Sqn. - (Nimrods (12)<br>(Ospreys) | No. 801 Sqn. - (Flycatchers (12)<br>(Nimrods) |
| No. 810 Sqn. - Baffins (12)               | No. 811 Sqn. - Baffins (12)                   |
| No. 820 Sqn. - Sharks (12)                | No. 822 Sqn. - Fairey III F (12)              |
| No. 821 Sqn. - Seals (12)                 |   |

H.M.S. Glorious

- No. 802 Sqn. - (Nimrods (12)  
                  (Ospreys)
- No. 823 Sqn. - Seals (12)

Catapult Flight No. 407 - Ospreys (6) for 2nd Cruiser Squadron at Home

Catapult Flight No. 443 - (Fairey III F)  
                                  (Ospreys) } (6) for 6th and 8th Cruiser Squadrons in America, West Indies and South Africa stations.

Catapult Flight No. 444 - Fairey III F (6) for Home Fleet Battleships

/Training and Development

Training and Development

Lee-on-Solent - School of Naval Co-operation

Calshot - Navigation School  
Training Squadron

Eosport - Torpedo Training Squadron  
Coast Defence Development Unit

Leuchars - No. 1 Flying Training School

The R.A.F. Mediterranean (Maritime) - June 1935

A.H.Q. - Valetta, Malta

A.O.C. - Air Commodore C. E. H. Rathbone, C.B., D.S.O.

Calafrana

Coastal Recce. - No. 202 Sqdn. - Fairey III F floatplanes (12 I.E.)

Fleet Air Arm Squadrons and Flights on the Station

No. 812 Sqdn. - Baffins (12)

No. 825 Sqdn. - Fairey III F (12)

Catapult Flight No. 445 - Ospreys (6)

Catapult Flight No. 447 - Ospreys (6)

The R.A.F. Iraq Command (Maritime Section)

Basrah - No. 203 Sqdn. - Rangoon flying boats. (6 I.E.)

The R.A.F. in Far East (Maritime)

Singapore

No. 205 Sqdn. - Singapore III flying boats (6 I.E.)

No. 36 Sqdn. - Torpedo Bomber - Horsleys (12 I.E.)

No. 100 Sqdn. - Torpedo Bomber - Vildebeest (12 I.E.)

F.A.A. - No. 803 Sqdn. - Ospreys (12) )  
F.A.A. - No. 824 Sqdn. - Seals (12) )

H.M.S. Hermes

Catapult Flight No. 403 - Ospreys (6) for 5th Cruiser Squadron

Catapult Flight No. 406 - Ospreys (6) for 4th Cruiser Squadron

Air Defence of Great Britain (ADGB) - June 1935

A.H.Q. Hillingdon House, Uxbridge

A.O.C.-in-C. - Air Chief Marshal Sir Robert Brooke-Popham, K.C.B., C.M.G.,  
D.S.O., A.F.C.

S.A.S.O. - Air Commodore A. D. Cunningham, C.B.E.

Western Area - H.Q. Andover

Aldergrove - No. 502 (Ulster) Sqdn. - Bomber - Virginias

/Andover

Western Area (Contd.)

Andover - No. 12 Sqn. - Bomber - Harts  
 No. 142 Sqn. - Bomber - Harts  
 R.A.F. Staff College and Air Navigation School

Boscombe Down - No. 9 Sqn. - Bomber - Virginias  
 No. 10 Sqn. - Bomber - Heyfords

Manston - No. 500 (Kent) Sqn. - Bomber - Virginias

Mildenhall - No. 99 Sqn. - Bomber - Heyfords

Waddington - No. 503 (Lincoln) Sqn. - Bomber - Hinaidis

Worthy Down - No. 7 Sqn. - Bomber - Virginias  
 No. 58 Sqn. - Bomber - Virginias

Central Area - H.Q. Abingdon

Abingdon - No. 15 Sqn. - Bomber - Harts  
 No. 40 Sqn. - Bomber - Gordons

Bicester - No. 101 Sqn. - Bomber - Sidestrands

Bircham Newton - No. 35 Sqn. - Bomber - Gordons  
 No. 207 Sqn. - Bomber - Gordons

Filton - No. 501 (Bristol) Sqn. - Bomber - Wallaces

Hucknall - No. 504 (Nottingham) Sqn. - Bomber - Wallaces

Upper Heyford - No. 18 Sqn. - Bomber - Harts  
 - No. 33 Sqn. - Bomber - Harts  
 No. 57 Sqn. - Bomber - Harts

Fighter Area - H.Q. Uxbridge

Biggin Hill - No. 23 Sqn. - Fighter - Demons  
 No. 32 Sqn. - Fighter - Bulldogs

Duxford - No. 19 Sqn. - Fighter - Bulldogs

Hawkinge - No. 25 Sqn. - Fighter - Furies

Hornchurch - No. 54 Sqn. - Fighter - Bulldogs  
 No. 65 Sqn. - Fighter - Demons

Kenley - No. 3 Sqn. - Fighter - Bulldogs  
 No. 17 Sqn. - Fighter - Bulldogs

Northolt - No. 41 Sqn. - Fighter - Demons  
 No. 111 Sqn. - Fighter - Bulldogs

Fighter Area (Contd.)

North Weald - No. 29 Sqn. - Fighter - Demons  
 No. 56 Sqn. - Fighter - Bulldogs

Tangmere - No. 1 Sqn. - Fighter - Furies  
 No. 43 Sqn. - Fighter - Furies

No. 1 Air Defence Group - H.Q. 33 to 34 Tavistock Place, W.C.1

Hendon - No. 24 Sqn. - Communications - Various types  
 No. 600 (London) Sqn. - Fighter - still on Harts  
 No. 601 (London) Sqn. - Fighter - still on Harts  
 No. 604 (Middlesex) Sqn. - Fighter - Demons

Abbotsinch - No. 602 (Glasgow) Sqn. - Bomber - Harts

Turnhouse - No. 603 (Edinburgh) Sqn. - Bomber - Harts

Castle Bromwich - No. 605 (Warwick) Sqn. - Bomber - Harts

Usworth - No. 607 (Durham) Sqn. - Bomber - Wapiti

Thornaby - No. 608 (North Riding) Sqn. - Bomber - Wapiti

Inland Area - June 1935

A.H.Q. - Bentley Priory, Stanmore, Middx.

A.O.C. - Air Vice-Marshal C. S. Burnett, C.B., C.B.E., D.S.O.

No. 22 Group - H.Q. South Farnborough

South Farnborough - No. 4 Sqn. - Army Co-op. - Audax

Manston - No. 2 Sqn. - Army Co-op. - Audax

Catterick - No. 26 Sqn. - Army Co-op. - Audax

Old Sarum - No. 13 Sqn. - Army Co-op. - Audax  
 No. 16 Sqn. - Army Co-op. - Audax  
 School of Army Co-operation

No. 23 Group - H.Q. Grantham

No. 2 Flying Training School - Digby

No. 3 Flying Training School - Grantham

No. 5 Flying Training School - Sealand

No. 6 Flying Training School - Netheravon

Central Flying School - Wittering

Armament Group - H.Q. Eastchurch

- No. 1 Armament Training Camp - Catfoss
- No. 2 Armament Training Camp - North Coates
- No. 3 Armament Training Camp - Sutton Bridge
- Air Armament School - Eastchurch
- Aeroplane and Armament Experimental Establishment - Martlesham

Overseas Commands - June 1935

R.A.F. Middle East - H.Q. Villa Victoria, Cairo

- Helionolis - No. 208 Sqdn. - Army Co-op. - Audax and "D" Flight on Demons
- No. 216 Sqdn. - Bomber Transport - Valentias
- Helwan - No. 45 Sqdn. - Bomber - Fairey III F (G.P.)
- Khartoum - No. 47 Sqdn. - Bomber - Gordons
- Amman - No. 14 Sqdn. - Bomber - Gordons
- Ismailia - No. 6 Sqdn. - Bomber - Gordons
- Abu Sueir - No. 4 Flying Training School
- Aden - No. 8 Sqdn. - Bomber - Vincents

Iraq Command - H.Q. Hinaidi

- Hinaidi - No. 55 Sqdn. - Bomber - Wapiti
- No. 70 Sqdn. - Bomber Transport - Valentias
- Mosul - No. 30 Sqdn. - Bomber - Hardy
- Shaibah - No. 84 Sqdn. - Bomber - Vincents

R.A.F. India - H.Q. Simla

- Ambala - No. 28 Sqdn. - Army Co-op. - Wapiti
- Kohat - No. 27 Sqdn. - Bomber - Wapiti
- No. 60 Sqdn. - Bomber - Wapiti
- Risalpur - No. 11 Sqdn. - Bomber - Harts
- No. 39 Sqdn. - Bomber - Harts
- Quetta - No. 5 Sqdn. - Army Co-op. - Wapiti
- No. 31 Sqdn. - Army Co-op. - Wapiti
- Peshawar - No. 20 Sqdn. - Army Co-op. - Wapiti

THE R.A.F. IN DECEMBER 1936R.A.F. Coastal Command (Maritime)

A.H.Q. - Lee-on-Solent, Hants

A.O.C.-in-C.-Air Marshal P. B. Joubert de la Ferte, C.B., C.M.G.,  
D.S.O.

S.A.S.O. - Air Commodore G. R. Bromet, D.S.O., O.B.E.

No. 16 (Reconnaissance) Group - H.Q. Lee-on-Solent

- Donibristle - No. 22 Sqdn. - Torpedo Bomber -  
Vildebeest III (12 I.E.)  
No. 42 Sqdn. - Torpedo Bomber -  
Vildebeest III - one flight (4)
- Bircham Newton - No. 206 (G.R.) Sqdn. - Ansons (12 I.E.)  
No. 220 (G.R.) Sqdn. - Ansons (12 I.E.)  
No. 269 (G.R.) Sqdn. - Ansons (12 I.E.)
- Felixstowe - No. 209 Sqdn. - Singapore III and Southampton  
flying boats (6 I.E.)
- Calshot - No. 201 Sqdn. - London flying boats (6 I.E.)
- Mount Batten - No. 204 Sqdn. - Scapa, Perth and London  
flying boats (6 I.E.)
- Pembroke Dock - No. 210 Sqdn. - Singapore III flying boats  
(6 I.E.)  
No. 228 Sqdn. - Stranraer, Scapa, London and  
Singapore III s (6 I.E.)

No. 17 (Training) Group - H.Q. Lee-on-Solent

- Lee-on-Solent - School of Naval Co-operation  
No. 1 Gunnery Co-operation Flight
- Calshot - Training Squadron
- Gosport - Torpedo Section  
Coast Defence Development Unit

Fleet Air Arm Squadrons and Flights

- | <u>H.M.S. Courageous</u>     | <u>H.M.S. Furious</u>          |
|------------------------------|--------------------------------|
| No. 800 Sqdn. - Nimrods (12) | No. 801 Sqdn. - Nimrods (12)   |
| No. 810 Sqdn. - Sharks (12)  | No. 811 Sqdn. - Swordfish (12) |
| No. 820 Sqdn. - Sharks (12)  | No. 822 Sqdn. - Seals (12)     |
| No. 824 Sqdn. - Sharks (12)  |                                |

Catapult Flight No. 702 - Seals and Walrus I (6) for 2nd Battle Squadron

Catapult Flight No. 712 - Walrus I (6) for 2nd Cruiser Squadron

Catapult Flight No. 716 - Ospreys (6) for 6th Cruiser Squadron (S. Africa)

Catapult Flight No. 718 - Walrus I (6) for 8th Cruiser Squadron  
(West Indies)

THE R.A.F. Mediterranean (Maritime) - December 1936

A.H.Q. - Valetta, Malta

A.O.C. - Air Commodore P. C. Maltby, D.S.O., A.F.C.

Calafrana - No. 202 Sqdn. - Scapa Flying boats (6 I.E.)

No. 2 Gunnery Co-operation Flights

Fleet Air Arm Squadrons and Flights on the StationH.M.S. Glorious

No. 802 Sqdn. - Nimrods (12)

No. 812 Sqdn. - Swordfish (12)

No. 823 Sqdn. - Swordfish (12)

No. 825 Sqdn. - Swordfish (12)

Catapult Flight No. 701 - Ospreys (6) - 1st Battle Squadron

Catapult Flight No. 705 - Ospreys (6) - Battlecruiser Squadron

Catapult Flight No. 711 - Walrus (6) - 1st Cruiser Squadron

Catapult Flight No. 713 - Ospreys (6) - 3rd Cruiser Squadron

The R.A.F. Iraq Command (Maritime Section)Basrah - No. 203 Sqdn. - Singapore III flying boats (6 I.E.)The R.A.F. in Far East (Maritime)Seletar, Singapore

No. 205 Sqdn. - Singapore III flying boats (6 I.E.)

No. 230 Sqdn. - Singapore III flying boats (6 I.E.)

No. 36 Sqdn. - Torpedo Bomber - Vildebeest III (12 I.E.)

No. 100 Sqdn. - Torpedo Bomber - Vildebeest III (12 I.E.)

Fleet Air Arm Squadrons and Flights on the China Station

No. 803 Sqdn. - Ospreys (12) )

No. 824 Sqdn. - Seals (12) )

H.M.S. Hermes

Catapult Flight No. 714 - Walrus I (6) - 4th Cruiser Squadron

Catapult Flight No. 715 - Walrus I (6) - 5th Cruiser Squadron

Catapult Flight No. 720 - Walrus I (6) - New Zealand Division

R.A.F. Bomber Command - December 1936

A.H.Q. - Uxbridge, Middx.

A.O.C.-in-C. - Air Chief Marshal Sir John Steel, K.C.B., K.B.E., C.M.G.

S.A.S.O. - Air Commodore D. C. S. Evill, D.S.C., A.F.C.

No. 1 Group - H.Q. Abingdon, BerksAbingdon

No. 15 Sqdn. - Hinds

No. 40 Sqdn. - Hinds

Lympne

No. 21 Sqdn. - Hinds

No. 34 Sqdn. - Hinds

Bicester

No. 101 Sqn. - Overstrands

Upper Heyford

No. 18 Sqn. - Hinds

No. 57 Sqn. - Harts

No. 218 Sqn. - Hinds

No. 2 Group - H.Q. Andover, Hants

Andover

No. 12 Sqn. - Hinds

No. 103 Sqn. - Hinds

No. 107 Sqn. - Hinds

R.A.F. Staff College

Hucknall

No. 98 Sqn. - Hinds

No. 104 Sqn. - Hinds

Turnhouse

No. 83 Sqn. - Hinds

Worthy Down

No. 49 Sqn. - Hinds

No. 35 Sqn. - Gordons

No. 207 Sqn. - Gordons

No. 3 Group - H.Q. Mildenhall, Suffolk

Boscombe Down

No. 10 Sqn. - Heyfords

No. 78 Sqn. - Heyfords

No. 97 Sqn. - Heyfords

No. 166 Sqn. - Heyfords

Driffield

No. 58 Sqn. - Virginias

No. 215 Sqn. - Virginias

Mildenhall

No. 38 Sqn. - Hendons

No. 99 Sqn. - Heyfords

Finningley

No. 7 Sqn. - Heyfords

No. 102 Sqn. - Heyfords

Wyton

No. 114 Sqn. - Hinds

No. 139 Sqn. - Hinds

Scampton

No. 9 Sqn. - Heyfords

No. 214 Sqn. - Virginias

No. 6 (Auxiliary) Group - H.Q. 33 to 34 Tavistock Place, W.C.1

Aldergrove - No. 502 (Ulster) - Wallaces

Castle Bromwich - No. 605 (Warwick) - Harts

Manston - No. 500 (Kent) - Harts

Usworth - No. 607 (Durham) - Demons

Filton - No. 501 (Bristol) - Wallaces

Thornaby - No. 608 (North Riding) - Wapiti

Waddington - No. 503 (Lincoln) - Wallaces

Yeadon - No. 609 (West Riding) - Harts

Hucknall - No. 504 (Nottingham) - Wallaces

Hooton Park - No. 610 (Cheshire) - Harts

Abbotsinch - No. 602 (Glasgow) - Harts

Speke - No. 611 (W. Lancs.) - Harts

Turnhouse - No. 603 (Edinburgh) - Harts

R.A.F. Fighter Command - December 1936

A.H.Q. - Stanmore, Middx.

A.O.C.-in-C. - Air Marshal Sir Hugh C. T. Dowding, K.C.B., C.M.G.

S.A.S.O. - Air Commodore A. D. Cunningham, C.B.E.

No. 11 Group - H.Q. UxbridgeBiggin HillNo. 23 Sqn. - Demons  
No. 32 Sqn. - GauntletsDuxfordNo. 19 Sqn. - Gauntlets  
No. 66 Sqn. - GauntletsKenleyNo. 3 Sqn. - Bulldogs  
No. 17 Sqn. - Gauntlets  
No. 46 Sqn. - GauntletsNorth WealdNo. 29 Sqn. - Demons  
No. 56 Sqn. - Gauntlets  
No. 151 Sqn. - GauntletsNortholt

No. 111 Sqn. - Gauntlets

HendonNo. 24 Sqn. Communications -  
Various  
No. 600 Sqn. (London) - still on  
Harts  
No. 601 (London) - still on Harts  
No. 604 (Middlesex) - DemonsCatterick - No. 41 Sqn. - DemonsHawkinge - No. 25 Sqn. - FuriesHornchurchNo. 54 Sqn. - Gauntlets  
No. 65 Sqn. - Gauntlets  
No. 74 Sqn. - DemonsMartlesham - No. 64 Sqn. - DemonsTangmere - No. 1 Sqn. - Furies  
No. 43 Sqn. - FuriesNo. 22 (Army Co-operation) Group - H.Q. South FarnboroughFarnborough - No. 4 (A.C.) Sqn. - Audax  
Hawkinge - No. 2 (A.C.) Sqn. - Audax  
Catterick - No. 26 (A.C.) Sqn. - Audax  
Old Sarum - No. 13 (A.C.) Sqn. - Audax  
No. 16 (A.C.) Sqn. - Audax  
School of Army Co-operationR.A.F. Training Command - December 1936

A.H.Q. - Market Drayton, Shropshire

A.O.C.-in-C.-Air Marshal Sir Charles S. Burnett, K.C.B., C.B.E., D.S.O.

No. 23 (Training) Group - H.Q. St. Vincents, GranthamNo. 1 Flying Training School - Leuchars  
No. 2 Flying Training School - Digby  
No. 3 Flying Training School - Grantham  
No. 5 Flying Training School - Sealand  
No. 6 Flying Training School - Netheravon  
No. 7 Flying Training School - Peterborough  
No. 8 Flying Training School - Montrose  
No. 9 Flying Training School - Thornaby/No. 10 Flying Training

SECRET

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APPENDIX V (Contd.)

No. 10 Flying Training School - Tern Hill

No. 11 Flying Training School - Wittering

Central Flying School - Upavon

School of Air Navigation }  
No. 48 (G.R.) Sqn. - Ansons ) Manston

No. 24 (Training) Group - H.Q. Halton Camp, Aylesbury

Martlesham - Aeroplane and Armament Experimental Establishment  
and many other Depots and Establishments at various places

Armament Group - H.Q. Eastchurch

Air Armament School - Eastchurch

No. 1 Armament Training Camp - Catfoss

No. 2 Armament Training Camp - Aldergrove

No. 3 Armament Training Camp - Sutton Bridge

Temporary Armament Training Camps at Leuchars and North Coates

Overseas Commands - December 1936

R.A.F. Middle East - H.Q. Villa Victoria, Cairo

Heliopolis - No. 208 Sqn. - Army Co-op. - Audax  
No. 216 Sqn. - Bomber Transport - Valentias

Helwan - No. 45 Sqn. - Bomber - Vincents

Khartoum - No. 47 Sqn. - Bomber - Vincents and Gordons

Amman - No. 14 Sqn. - Bomber - Gordons

Gaza - No. 33 Sqn. - Bomber - Harts

Ismailia - No. 6 Sqn. - Bomber - Harts with one flight on Demons  
No. 142 Sqn. - Bomber - Hinds

Abu Sueir - No. 4 Flying Training School

Aden - No. 8 Sqn. - Bomber - Vincents

Iraq Command - H.Q. Hinaidi

Hinaidi - No. 55 Sqn. - Bomber - Wapiti  
No. 70 Sqn. - Bomber Transport - Valentias

Dhibban - No. 30 Sqn. - Bomber - Hardy

Shaibah - No. 34 Sqn. - Bomber - Vincents

R.A.F. India Command - H.Q. New Delhi

Ambala - No. 28 Sqn. - Army Co-op. - Audax

Karachi - No. 31 Sqn. - Army Co-op. - Wapiti

Kohat - No. 27 Sqn. - Bomber - Wapiti  
No. 60 Sqn. - Bomber - Wapiti

Risalpur - No. 11 Sqn. - Bomber - Harts  
No. 39 Sqn. - Bomber - Harts

Chaklala - No. 5 Sqn. - Army Co-op. - Wapiti

Peshawar - No. 20 Sqn. - Army Co-op. - Wapiti

THE R.A.F. IN DECEMBER 1937R.A.F. Coastal Command (Maritime)

- A.H.Q. - Lee-on-Solent, Hants.  
 A.O.C.-in-C. - Air Marshal Sir Frederick W. Bowhill, K.C.B., C.M.G.,  
 D.S.O.  
 S.A.S.O. - Air Commodore G. R. Bromet, D.S.O., O.B.E.

No. 16 (Reconnaissance) Group - H.Q. Lee-on-Solent

- A.O.C. - Air Vice-Marshal H. M. Cave-Brown-Cave, C.B., D.S.O., D.F.C.  
Donibristle - No. 22 Sqdn. - Torpedo Bomber - Vildebeest III  
 (12 I.E.)  
 No. 42 Sqdn. - Torpedo Bomber - Vildebeest IV  
 (12 I.E.)  
Abbotsinch - No. 269 (G.R.) Sqdn. - Ansons (18 I.E.)  
Thornaby - No. 224 (G.R.) Sqdn. - Ansons (18 I.E.)  
 No. 233 (G.R.) Sqdn. - Ansons (18 I.E.)  
Bircham Newton - No. 206 (G.R.) Sqdn. - Ansons (18 I.E.)  
 No. 220 (G.R.) Sqdn. - Ansons (18 I.E.)  
Felixstowe - No. 209 (G.R.) Sqdn.\* See R.A.F. Mediterranean  
Tangmere - No. 217 (G.R.) Sqdn. - Ansons (18 I.E.)  
Calshot - No. 201 (G.R.) Sqdn.\* London flying boats (6 I.E.)  
Mount Batten - No. 204 (G.R.) Sqdn.\* London flying boats (6 I.E.)  
Pembroke Dock - No. 210 (G.R.) Sqdn.\* see R.A.F. Mediterranean  
 No. 228 (G.R.) Sqdn.\* Stranraer, Scapa and London  
 flying boats (6 I.E.)

\* The Flying Boat squadrons were rated as G.R. from September 1937.

No. 17 (Training) Group - H.Q. Lee-on-Solent

A.O.C. - Air Commodore C. D. Breese, C.B., A.F.C.

- Lee-on-Solent - School of Naval Co-operation  
 No. 2 A/A Co-operation Unit  
Gosport - Torpedo Section and Training Squadron  
Calshot - Training Squadron with No. 240 (G.R.) Sqdn.\*  
 Scapa flying boats (6 I.E.)

Fleet Air Arm Squadrons and Flights at HomeH.M.S. Courageous

- No. 800 Sqdn. - Nimrods (12)  
 No. 810 Sqdn. - Sharks (12)  
 No. 820 Sqdn. - Sharks (12)  
 No. 821 Sqdn. - Sharks (12)

H.M.S. Furious

- No. 801 Sqdn. - Nimrods (12)  
 No. 811 Sqdn. - Swordfish (12)  
 No. 822 Sqdn. - Seals (12)

/At Abingdon

At Abingdon

No. 802 Sqdn. Nimrods (12) while Glorious was refitting.

Catapult Flight No. 702 - Walrus I (6) - for 2nd Battle Squadron

Catapult Flight No. 712 - Walrus I (6) - for 2nd Cruiser Squadron

Catapult Flight No. 716 - Ospreys (6) - for 6th Cruiser Squadron  
(S. Africa)

Catapult Flight No. 718 - Walrus I (6) - for 8th Cruiser Squadron  
(West Indies)

The R.A.F. Mediterranean (Maritime) - December 1937

A.H.Q. - Valetta, Malta

A.O.C. - Air Commodore P. C. Maltby, D.S.O., A.F.C.

Calafrana

No. 202 (G.R.) Sqdn. - London II flying boats (6 I.E.)

No. 3 A/A Co-operation Unit

No. 1 (G.R.) Wing in Cyclops

No. 209 (G.R.) Sqdn. - Singapore III flying boats (6 I.E.)

No. 210 (G.R.) Sqdn. - 4 Singapore IIIs - flying boats (6 I.E.)  
2 Sunderlands Is.

Fleet Air Arm Squadrons and Flights

No. 812 Sqdn. - Swordfish (12)

No. 823 Sqdn. - Swordfish (12)

No. 825 Sqdn. - Swordfish (12)

} At Malta while Glorious  
was refitting.

Catapult Flight No. 701 - Ospreys (6) - for 1st Battle Squadron

Catapult Flight No. 705 - Ospreys (6) - for Battlecruiser Squadron

Catapult Flight No. 711 - Walrus I (6) - for 1st Cruiser Squadron

Catapult Flight No. 713 - Seafoxes (6) - for 3rd Cruiser Squadron

R.A.F. Iraq (Maritime Section)

Basrah - No. 203 (G.R.) - Singapore III flying boats (6 I.E.)

R.A.F. Far East (Maritime) - H.Q. Singapore

Seletar

No. 205 (G.R.) Sqdn. - Singapore III flying boats (6 I.E.)

No. 230 (G.R.) Sqdn. - Singapore III flying boats (6 I.E.)

No. 36 Sqdn. - Torpedo Bomber - Vildebeest III (12 I.E.)

No. 100 Sqdn. - Torpedo Bomber - Vildebeest III (12 I.E.)

/Fleet Air Arm ...

Fleet Air Arm Squadrons and Flights on the China Station

No. 813 Sqdn. - Swordfish (12) }  
 No. 824 Sqdn. - Swordfish (12) } H.M.S. Eagle

Catapult Flight No. 714 - Walrus I (6) - 4th Cruiser Squadron  
 Catapult Flight No. 715 - Walrus I (6) - 5th Cruiser Squadron  
 Catapult Flight No. 720 - Walrus I (6) - New Zealand Division

R.A.F. Bomber Command - December 1937

A.H.Q. - Uxbridge, Middx.

A.O.C.-in-C. - Air Chief Marshal Sir Edgar R. Ludlow-Hewitt, K.C.B.,  
 C.M.G., D.S.O., M.C.

S.A.S.O. - Air Commodore D.C.S. Evill, D.S.C., A.F.C.

No. 1 Group - H.Q. Abingdon, BerksAbingdon

No. 15 Sqdn. - Hinds  
 No. 140 Sqdn. - Hinds

Bicester

No. 90 Sqdn. - Blenheim I  
 No. 101 Sqdn. - Overstrands

Cranfield

No. 62 Sqdn. - Hinds  
 No. 82 Sqdn. - Hinds  
 No. 108 Sqdn. - Hinds

Usworth - No. 103 Sqdn. - Hinds

No. 2 Group - H.Q. Andover, HantsAndover

No. 12 Sqdn. - Hinds  
 No. 142 Sqdn. - Hinds

Abbotsinch

No. 602 (Glasgow) - Harts

Castle Bromwich

No. 605 (Warwick) - Harts

Turnhouse

No. 83 Sqdn. - Hinds

Lympne

No. 21 Sqdn. - Hinds  
 No. 34 Sqdn. - Hinds

Upper Heyford

No. 18 Sqdn. - Hinds  
 No. 57 Sqdn. - Hinds  
 No. 218 Sqdn. - Hinds

Harwell

No. 105 Sqdn. - Battles I  
 No. 107 Sqdn. - Hinds  
 No. 226 Sqdn. - Battles I

Worthy Down

No. 49 Sqdn. - Hinds  
 No. 35 Sqdn. - Wellesley II  
 No. 207 Sqdn. - Wellesley II

Upwood

No. 52 Sqdn. - Battles I  
 No. 63 Sqdn. - Battles I

Wyton

No. 114 Sqdn. - Blenheim I  
 No. 139 Sqdn. - Blenheim I

Hucknall

No. 98 Sqdn. - Hinds  
 No. 104 Sqdn. - Hinds

No. 3 Group - H.Q. Mildenhall, SuffolkFeltwell

No. 37 Sqn. - Harrows  
No. 214 Sqn. - Harrows

Marham

No. 38 Sqn. - Hendons  
No. 115 Sqn. - Harrows

Honington

No. 77 Sqn. - Wellesley II  
No. 102 Sqn. - Heyfords

Mildenhall

No. 99 Sqn. - Heyfords  
No. 149 Sqn. - Heyfords

Grantham

No. 113 Sqn. - Hinds

Scampton

No. 9 Sqn. - Heyfords  
No. 148 Sqn. - Wellesley II

No. 4 Group - H.Q. Linton-upon-Ouse, Yorks.Boscombe Down

No. 51 Sqn. - Whitley I  
No. 58 Sqn. - Virginias  
No. 88 Sqn. - Battles I

Driffield

No. 75 Sqn. - Harrows  
No. 215 Sqn. - Harrows

Finningley

No. 7 Sqn. - Heyfords  
No. 76 Sqn. - Wellesley II

Dishforth

No. 10 Sqn. - Whitley I  
No. 78 Sqn. - Whitley I

Leconfield

No. 97 Sqn. - Whitley I  
No. 166 Sqn. - Heyfords

No. 5 Group - H.Q. St. Vincents, Grantham, Lincs.Grantham

No. 211 Sqn. - Hinds

Waddington

No. 44 Sqn. - Blenheim I  
No. 50 Sqn. - Hinds  
No. 110 Sqn. - Blenheim I

Hemswell

No. 61 Sqn. - Ansons  
No. 144 Sqn. - Blenheims I

No. 6 (Auxiliary) Group - H.Q. 33 to 34 Tavistock Place, W.C.1

Aldergrove - No. 502 (Ulster) - Hinds  
Manston - No. 500 (Kent) - Hinds  
Filton - No. 501 (Bristol) - Harts  
Waddington - No. 503 (Lincoln) - Hinds  
Hucknall - No. 504 (Nottingham) - Wallaces  
Turnhouse - No. 603 (Edinburgh) - Harts  
Yeadon - No. 609 (West Riding) - Harts  
Hooton Park - No. 610 (Cheshire) - Hinds  
Speke - No. 611 (W. Lancs.) - Harts  
Aberdeen - No. 612 (Aberdeen) - Hectors  
Cardiff - No. 614 (Glamorgan) - Hectors  
Kenley - No. 615 (Surrey) - Audax

R.A.F. Fighter Command - December 1957

A.H.Q. - Stanmore, Middx.

A.O.C.-in-C. - Air Chief Marshal Sir Hugh C. T. Dowding, G.C.V.O., K.C.B.,

S.A.S.O. - Air Commodore A. D. Cunningham, C.B.E., ~~XXXXXXXXXX~~

C.M.G.

No. 11 Group - H.Q. Uxbridge, Middx.

Biggin Hill

No. 32 Sqn. - Gauntlets  
No. 79 Sqn. - Gauntlets  
No. 1 A/A Co-op. Unit

Kenley

No. 3 Sqn. - Gladiator I  
No. 17 Sqn. - Gauntlets

Debden

No. 20 Sqn. - Demons  
No. 80 Sqn. - Gladiator I  
No. 87 Sqn. - Gladiator I

Northolt

No. 23 Sqn. - Demons  
No. 111 Sqn. - Gauntlets

Hendon

No. 24 Sqn. - Communications  
No. 600 (London) - Demons  
No. 601 (London) - Demons  
No. 604 (Middx.) - Demons

North Weald

No. 56 Sqn. - Gauntlets  
No. 151 Sqn. - Gauntlets

Hornchurch

No. 54 Sqn. - Gauntlets  
No. 65 Sqn. - Gauntlets  
No. 74 Sqn. - Demons

Tangmere

No. 1 Sqn. - Furies  
No. 43 Sqn. - Furies

Hawkinge

No. 25 Sqn. - Demons

No. 12 Group - H.Q. Hucknall, Notts.

Church Fenton

No. 72 Sqn. - Gladiator I  
No. 213 Sqn. - Gauntlets

Digby

No. 46 Sqn. - Gauntlets  
No. 73 Sqn. - Gladiator I

Duxford

No. 19 Sqn. - Gauntlets  
No. 66 Sqn. - Gauntlets

Martlesham

No. 64 Sqn. - Demons

Usworth

No. 607 (Durham) - Demons

Catterick

No. 41 Sqn. - Furies

Thornaby

No. 608 (North Riding) - Demons

/No. 22 (Army Co-op.)

No. 22 (Army Co-op.) Group - H.Q. South FarnboroughOdiham

No. 4 (A.C.) Sqdn. - Hectors  
 No. 13 (A.C.) Sqdn. - Hectors

Old Sarum

No. 16 (A.C.) Sqdn. - Audax  
 No. 59 (A.C.) Sqdn. - Hectors  
 School of Army Co-operation

Farnborough

No. 53 (A.C.) Sqdn. - Hectors

Catterick

No. 26 (A.C.) Sqdn. - Hectors

Hawkinge

No. 2 (A.C.) Sqdn. - Hectors

R.A.F. Training Command - December 1937

A.H.Q. - Market Drayton, Shropshire

A.O.C.-in-C. - Air Marshal Sir Charles S. Burnett, K.C.B., C.B.E.,  
 D.S.O.

No. 23 (Training) Group - H.Q. Grantham

No. 1 F.T.S. - Leuchars	No. 7 F.T.S. - Peterborough
No. 2 F.T.S. - Brize Norton	No. 8 F.T.S. - Montrose
No. 3 F.T.S. - South Cerney	No. 9 F.T.S. - Hullavington
No. 5 F.T.S. - Sealand	No. 10 F.T.S. - Tern Hill
No. 6 F.T.S. - Netheravon	No. 11 F.T.S. - Wittering

Central Flying School - Upavon  
 School of Air Navigation  
 No. 43 (G.R.) Sqdn. - Ansons } Manston

No. 24 (Training) Group - H.Q. Halton Camp, Aylesbury

Martlesham - Aeroplane and Armament Experimental Establishment  
 and many other Depots and Establishments at various  
 places

No. 25 (Armament) Group - H.Q. Eastchurch

Eastchurch - No. 1 Air Armament School

North Coates - No. 2 Air Armament School

Nos. 1 to 8 Armament Training Camps at various places.

Overseas Commands - December 1937R.A.F. Middle East - H.Q. Villa Victoria, CairoHeliopolis

No. 203 (A.C.) Sqdn. - Audax

No. 216 Sqdn. - Bomber Transport - Valentias

Helwan

No. 45 Sqdn. - Bomber - Wellesley II

/Khartoum

Khartoum - No. 47 Sqdn. - Bomber - Vincents and Gordons  
Ismailia - No. 33 Sqdn. - Bomber - Harts  
No. 6 Sqdn. - Bomber - Harts with one flight on  
Demons  
Amman - No. 14 Sqdn. - Bomber - Gordons  
Abu Sueir - No. 4 Flying Training School  
Aden - No. 8 Sqdn. - Bomber - Vincents  
Nairobi - No. 223 Sqdn. - Bomber - Vincents

R.A.F. Iraq - H.Q. Hinaidi

Dhibban

No. 30 Sqdn. - Bomber - Hardy  
No. 55 Sqdn. - Bomber - Vincents  
No. 70 Sqdn. - Bomber Transport - Valentias

Shaibah

No. 84 Sqdn. - Bomber - Vincents

R.A.F. India - H.Q. New Delhi

Ambala - No. 28 (A.C.) Sqdn. - Audax  
Karachi - No. 31 (A.C.) Sqdn. - Wapiti  
Kohat - No. 27 Sqdn. - Bomber - Wapiti  
- No. 60 Sqdn. - Bomber - Wapiti  
Risalpur - No. 11 Sqdn. - Bomber - Harts  
No. 39 Sqdn. - Bomber - Harts  
Chaklala - No. 5 (A.C.) Sqdn. - Wapiti  
Peshawar - No. 20 (A.C.) Sqdn. - Wapiti

THE R.A.F. IN JANUARY 1939

R.A.F. Coastal Command (Maritime)

A.H.Q. - Lee-on-Solent, Hants

A.O.C.-in-C. - Air Marshal Sir Frederick W. Bowhill, K.C.B., C.M.G.,  
D.S.O.

S.A.S.O. - Air Commodore F.G.D. Hards, D.S.C., D.F.C.

No. 16 (Reconnaissance Group) - H.Q. Chatham,  
S.O. - Group Captain R. L. G. Marix, D.S.O.

Bircham Newton

(I.E. I.R.)

No. 206 (G.R.) Sqdn. - Ansons (18 + 6)

No. 220 (G.R.) Sqdn. - Ansons (18 + 6)

Calshot

No. 201 (G.R.) Sqdn. - London II (6 + 2)

No. 240 (G.R.) Sqdn. - Singapore III (6 + 2)

Eastchurch

No. 48 (G.R.) Sqdn. - Ansons (18 + 6)

Felixstowe

No. 209 (G.R.) Sqdn. - Singapore III and Stranraer (6 + 2)

Detling

No. 500 (Kent) (G.R.) - Hinds (18)

Mount Batten

No. 204 (G.R.) Sqdn. - London II (6 + 2)

Tangmere

No. 217 (G.R.) Sqdn. - Ansons (18 + 6)

Pembroke Dock

No. 210 (G.R.) Sqdn. - Sunderland I (6 + 2)

No. 228 (G.R.) Sqdn. - Sunderland I and Stranraer (6 + 2)

Thorney Island

No. 22 (T.B.) Sqdn. - Vildebeest III (12 + 4)

No. 42 (T.B.) Sqdn. - Vildebeest IV (12 + 4)

No. 18 (Reconnaissance) Group - H.Q. Donibristle  
A.O.C. - Air Commodore C. D. Breese, C.B.,  
A.F.C.

Leuchars

No. 224 (G.R.) Sqdn. - Ansons (18 + 6)

No. 233 (G.R.) Sqdn. - Ansons (18 + 6)

/Aldergrove

Aldergrove

No. 502 (Ulster)(G.R.) - Hinds (18)

Abbotsinch

No. 269 (G.R.) Sqdn. - Ansons (18 + 6)

Dyce

No. 612 (Aberdeen) - Hectors (12)

No. 17 (Training) Group - H.Q. Lee-on-Solent

A.O.C. - Air Commodore T. E. B. Howe, C.B.E.,  
A.F.C.

Lee-on-Solent - No. 2 A/A Co-op. Unit

Ford - School of Naval Co-operation

Thorney Island - School of General Reconnaissance

Gosport - Torpedo Section and Training Squadron

Calshot - Training Squadron

R.A.F. Mediterranean (Maritime)

A.H.Q. - Valetta, Malta

A.O.C. - Air Commodore R. Leckie, D.S.O., D.S.C., D.F.C.

Calafra

No. 202 (G.R.) Sqdn. - London II (6 + 2)

Halfar

No. 3 A/A Co-op. Unit

R.A.F. Iraq (Maritime Section)

Basrah

No. 203 (G.R.) Sqdn. - Singapore III (6 + 2)

R.A.F. Far East (Maritime - H.Q. Singapore)

Seletar

No. 205 (G.R.) Sqdn. - Singapore III (6 + 2)

No. 230 (G.R.) Sqdn. - Sunderland I (6 + 2)

No. 36 (T.B.) Sqdn. - Vildebeest III (12 + 4)

No. 100 (T.B.) Sqdn. - Vildebeest III (12 + 4)

No. 4 A/A Co-op. Unit

/R.A.F. Bomber Command - January 1939

R.A.F. Bomber Command - January 1939

A.H.Q. Uxbridge, Middx.

A.O.C.-in-C. Air Chief Marshal Sir Edgar R. Ludlow-Hewitt, K.C.B.,  
C.M.G., D.S.O., M.C.

No. 1 Group - H.Q. Abingdon

Abingdon

No. 15 Sqn. - Battles I  
No. 40 Sqn. - Battles I  
No. 103 Sqn. - Battles I

Boscombe Down

No. 88 Sqn. - Battles I  
No. 150 Sqn. - Battles I  
No. 218 Sqn. - Battles I

Andover

No. 12 Sqn. - Battles I  
No. 142 Sqn. - Battles I  
R.A.F. Staff College

Harwell

No. 105 Sqn. - Battles I  
No. 107 Sqn. - Blenheim I  
No. 226 Sqn. - Battles I

Bicester

No. 90 Sqn. - Blenheim I  
No. 101 Sqn. - Blenheim I

Upper Heyford

No. 18 Sqn. - Blenheim I  
No. 34 Sqn. - Blenheim I  
No. 57 Sqn. - Blenheim I

Eastchurch - No. 21 Sqn. - Blenheim I

No. 2 Group - H.Q. Wyton, Hunts.

Bassingbourn

No. 104 Sqn. - Blenheim I  
No. 108 Sqn. - Blenheim I

Cottesmore

No. 35 Sqn. - Battles I  
No. 207 Sqn. - Battles I

Cranfield

No. 62 Sqn. - Blenheim I  
No. 82 Sqn. - Blenheim I

Upwood

No. 52 Sqn. - Battles I  
No. 63 Sqn. - Battles I

Wyton

No. 114 Sqn. - Blenheim I  
No. 139 Sqn. - Blenheim I

Hucknall

No. 98 Sqn. - Battles I

Castle Bromwich

No. 605 (Warwick) - Harts

No. 3 Group - H.Q. Mildenhall, Suffolk

Mildenhall

No. 99 Sqn. - Wellington Ic  
No. 149 Sqn. - Wellington Ic

Feltwell

No. 37 Sqn. - Wellington Ic  
No. 214 Sqn. - Harrows

Stradishall

No. 9 Sqn. - Wellington Ic  
No. 148 Sqn. - Wellington Ic

Honington

No. 75 Sqn. - Harrows  
No. 215 Sqn. - Harrows

Marham

No. 38 Sqn. - Wellington Ic  
No. 115 Sqn. - Harrows

/No. 4 Group -...

No. 4 Group - H.Q. Linton-on-Ouse, Yorks

Linton-on-Ouse

No. 51 Sqn. - Whitley I  
No. 58 Sqn. - Whitley I

Driffield

No. 7 Sqn. - Whitley I  
No. 102 Sqn. - Heyfords

Leconfield

No. 97 Sqn. - Whitley I  
No. 166 Sqn. - Heyfords

Finningley

No. 7 Sqn. - Whitley I  
No. 76 Sqn. - Wellesley II

Dishforth

No. 10 Sqn. - Whitley I  
No. 78 Sqn. - Whitley I

No. 5 Group - H.Q. St. Vincents, Grantham, Lincs.

Hemswell

No. 61 Sqn. - Blenheim I  
No. 144 Sqn. - Blenheim I

Waddington

No. 44 Sqn. - Blenheim I  
No. 50 Sqn. - Hampden I  
No. 110 Sqn. - Blenheim I

Thornaby

No. 106 Battles I  
No. 185 Sqn. - Battles I

Scampton

No. 49 Sqn. - Hampden I  
No. 83 Sqn. - Hampden I

No. 6 (Auxiliary) H.Q. - 11 Tavistock Place, W.C.1

Hooton Park - No. 610 (Cheshire) - Hinds  
No. 611 (W. Lancs.) - Harts

R.A.F. Fighter Command - January 1939

A.H.Q. - Stanmore, Middx.

A.O.C.-in-C. - Air Chief Marshal Sir Hugh C. T. Dowding, G.C.V.O.,  
K.C.B., C.M.G.

S.A.S.O. - Air Commodore K. R. Park, M.C., D.F.C.

No. 11 Group - H.Q. Uxbridge, Middx.

Biggin Hill

No. 32 Sqn. - Hurricane I  
No. 79 Sqn. - Hurricane I

Hendon

No. 24 (Comm.) Sqn. - Various types  
No. 600 (London) - Demons  
No. 601 (London) - Gauntlets  
No. 604 (Middx.) - Demons

Debden

No. 29 Sqn. - Blenheim F.  
No. 85 Sqn. - Hurricane I  
No. 87 Sqn. - Hurricane I

Hornchurch

No. 54 Sqn. - Gladiator I  
No. 65 Sqn. - Gladiator I  
No. 74 Sqn. - Gauntlets

Filton

No. 501 (Bristol) - Gauntlets

Hawkinge

No. 25 Sqn. - Gladiator I

/North Weald

North Weald

No. 56 Sqn. - Hurricane I  
No. 151 Sqn. - Gauntlets

Tangmere

No. 1 Sqn. - Hurricane I  
No. 43 Sqn. - Hurricane I

No. 12 Group - H.Q. Hucknall, NottsChurch Fenton

No. 72 Sqn. - Gladiator I  
No. 64 Sqn. - Blenheim F.

Duxford

No. 19 Sqn. - Spitfire IA  
No. 66 Sqn. - Spitfire IA

Catterick

No. 41 Sqn. - Spitfire IA

Doncaster (S. Yorks) Gauntlets

No. 616 (S. Yorks) Gauntlets

Thornaby

No. 608 (N. Riding) - Demons

Usworth (Durham) Gladiator INo. 22 (Army Co-op.) Group - H.Q. South FarnboroughOdiham

No. 4 (A.C.) Sqn. -  
Lysander II  
No. 13 (A.C.) Sqn. - Hectors  
No. 53 (A.C.) Sqn. - Hectors

Abbotsinch - No. 602 (Glasgow) (A.C.) - Hectors

Cardiff - No. 614 (Glamorgan) (A.C.) - Hectors

Hawkinge - No. 2 (A.C.) Sqn. - Hectors

Catterick - No. 26 (A.C.) Sqn. - Hectors

Farnborough - No. 1 A/A Co-op. Unit

Kenley

No. 3 Sqn. - Gladiator I  
No. 17 Sqn. - Gauntlets  
No. 615 (Surrey) - Gauntlets

Northolt

No. 111 Sqn. - Hurricane I

Digby

No. 46 Sqn. - Gauntlets  
No. 73 Sqn. - Hurricane I

Wittering

No. 23 Sqn. - Blenheim F.  
No. 213 Sqn. - Gauntlets

Hucknall

No. 504 (Notts) still on Hinds

Yeadon

No. 609 (W. Riding) still on  
Hinds

Turnhouse

No. 603 (Edinburgh) still on  
Hinds

R.A.F. Training Command - January 1939

A.H.Q. - Market Drayton, Shropshire

A.O.C.-in-C. - Air Marshal Sir Charles S. Burnett, K.C.B., C.B.E., D.S.O.

No. 23 (Training) Group - H.Q. Grantham, Lincs.

No. 1 F.T.S. - Netheravon                      No. 7 F.T.S. - Peterborough

No. 2 F.T.S. - Brize Norton                      No. 8 F.T.S. - Montrose

No. 3 F.T.S. - South Cerney                      No. 9 F.T.S. - Hullavington

No. 5 F.T.S. - Sealand                      No. 10 F.T.S. - Ternhill

No. 6 F.T.S. - Little Rissington                      No. 11 F.T.S. - Shawbury

Central Flying School - Upavon

School of Air Navigation - Manston

No. 24 (Training) Group - H.Q. Halton Camp - AylesburyMartlesham - Aeroplane and Armament Experimental Establishment and many other Depots and Establishments at various placesNo. 25 (Armament) Group - H.Q. EastchurchManby - No. 1 Air Armament SchoolEastchurch - No. 2 Air Armament School

Nos. 1 to 3 Armament Training Stations at various places.

No. 26 (Training) Group - H.Q. Hendon

Nos. 1 to 29 Elementary and Reserve Training Schools at various places

Overseas Commands - January 1939R.A.F. Middle East - H.Q. Victoria, CairoHeliopolisNo. 113 Sqn. - Bomber - Hinds  
No. 208 (A.C.) Sqn. - Lysander I  
No. 216 Sqn. - Bomber Transport -  
ValentiasIsmailiaNo. 33 Sqn. - Fighter -  
Gladiator I  
No. 80 Sqn. - Fighter -  
Gladiator I  
No. 211 Sqn. - Bomber - HindsHelwanNo. 45 Sqn. - Bomber -  
Wellesley IIRamlehNo. 6 Sqn. - Bomber - Hardy  
with one flight on Gauntlets

/Khartoum

Khartoum

No. 47 Sqdn. - Bomber -  
Vincent and Gordons

Amman

No. 14 Sqdn. - Bomber -  
Wellesley II

Abu Sueir

No. 4 Flying Training School

Aden

No. 8 Sqdn. - Bomber - Vincent

Nairobi

No. 223 Sqdn. - Bomber - Wellesley II

R.A.F. Iraq - H.Q. Habbaniya

Habbaniya

No. 30 Sqdn. - Bomber - Blenheim I

No. 55 Sqdn. - Bomber - Vincent

No. 70 Sqdn. - Bomber Transport - Valentias

Shaibah

No. 84 Sqdn. - Bomber - Vincent

R.A.F. India - H.Q. New Delhi

Ambala

No. 28 (A.C.) Sqdn. - Audax

Lahore

No. 31 (A.C.) Sqdn. - Wapiti

Kohat

No. 27 Sqdn. - Bomber - Wapiti

No. 60 Sqdn. - Bomber - Wapiti

Risalpur

No. 5 (A.C.) Sqdn. - Wapiti

No. 11 Sqdn. - Bomber - Harts

No. 39 Sqdn. - Bomber - Harts

Peshawar

No. 20 (A.C.) Sqdn. - Wapiti

/THE R.A.F. ON 27 AUGUST 1939

THE R.A.F. ON 27 AUGUST 1939R.A.F. Coastal Command (Maritime)

A.H.Q. - Eastbury Park, Northwood, Middx.

A.O.C.-in-C. - Air Marshal Sir Frederick W. Bowhill, K.C.B., C.M.G.,  
D.S.O.

S.A.S.O. - Air Commodore F. G. D. Hards, D.S.C., D.F.C.

No. 15 Group - A.H.Q. Mountwise, Plymouth

A.O.C. - Air Commodore R. G. Parry, D.S.O.

AldergroveNo. 502 (Ulster) - Ansons  
(I.E. I.R.)  
(14 + 5)WarmwellNo. 217 Sqdn. - Ansons  
(18 + 6)Carew Cheriton

No. 217 Sqdn. - one flight

No. 16 Group - A.H.Q. Chatham

S.O. - Group Captain R. L. G. Marix, D.S.O.

Bircham NewtonNo. 42 (T.B.) Sqdn. -  
Vildebeest IV (12 + 4)  
No. 206 Sqdn. - Ansons (18 + 6)Detling

No. 500 (Kent) - Ansons (14 + 5)

No. 18 Group - A.H.Q. - Pitreavie Castle, Rosyth

A.O.C. - Air Commodore C. D. Breeze, C.B., A.F.C.

LerwickNo. 100 Wing in S.S. Manela  
No. 201 Sqdn. - London II (6 + 2)InvergordonNo. 209 Sqdn. - Stranraers (6 + 2)  
No. 240 Sqdn. - London II (6 + 2)Woodhaven

No. 210 Sqdn. - 3 Sunderlands

Mount BattenNo. 204 Sqdn. - Sunderland I  
(I.E. I.R.)  
(6 + 2)Pembroke DockNo. 210 Sqdn. - Sunderland I  
(6 + 2)  
(less detachment at Woodhaven)  
No. 228 Sqdn. - Detached to  
MaltaThorney IslandNo. 22 (T.B.) Sqdn. -  
Vildebeest III (12 + 4)  
(in reserve testing Beauforts)  
No. 48 Sqdn. - Ansons (18 + 6)LeucharsNo. 224 Sqdn. - Hudson I  
(18 + 6)  
No. 233 Sqdn. - Ansons  
(18 + 6)Montrose

No. 269 Sqdn. - Ansons (18 + 6)

DyceNo. 612 (Aberdeen) - Ansons  
(14 + 5)ThornabyNo. 220 Sqdn. - Ansons (18 + 6)  
No. 608 (N. Riding) - Ansons  
(14 + 5)

/No. 17 (Training Group)...

SECRET

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APPENDIX V (Contd.)

No. 17 (Training Group) - A.H.Q. - Lee-on-Solent  
A.O.C. - Air Commodore T. E. B. Howe, C.B.E.,  
A.F.C.

Lee-on-Solent - No. 2 A/A Co-op. Unit

Ford - School of Naval Co-operation

Thorney Island - School of General Reconnaissance

Gosport - Torpedo Section and Training Squadron

Calshot - Training Squadron

R.A.F. Mediterranean (Maritime) - 27 August 1939

A.H.Q. - Valetta, Malta.

A.O.C. - Air Commodore R. Leckie, D.S.O., D.S.C., D.F.C.

Calafra

No. 86 Wing

No. 202 Sqn. - London II (6 + 2)

No. 228 Sqn. - Sunderland I (6 + 2)

Halfar

No. 3 A/A Co-op. Unit - Swordfish (3)

R.A.F. Iraq (Maritime Section)

Basrah - No. 203 Sqn. - Singapore III (6 + 2)

R.A.F. Far East (Maritime) - H.Q. Singapore

Seletar

No. 205 Sqn. - Singapore III (6 + 2)

No. 230 Sqn. - Sunderland I (6 + 2)

No. 36 (T.B.) Sqn. - Vildebeest III (12 + 4)

No. 100 (T.B.) Sqn. - Vildebeest III (12 + 4)

No. 4 A/A Co-op. Unit

R.A.F. Bomber Command - 27 August 1939

A.H.Q. - Uxbridge, Middx.

A.O.C.-in-C. - Air Chief Marshal Sir Edgar R. Ludlow-Hewitt, K.C.B., C.M.G.,  
D.S.O., M.C.

S.A.S.O. - Air Commodore N. H. Bottomley, C.I.E., D.S.O., A.F.C.

No. 1 Group - H.Q. Abingdon, Berks

Abingdon

No. 15 Sqn. - Battles I

No. 40 Sqn. - Battles I

Bicester

No. 12 Sqn. - Battles I

No. 142 Sqn. - Battles I

/Benson

Benson

No. 103 Sqn. - Battles I  
No. 150 Sqn. - Battles I

Harwell

No. 105 Sqn. - Battles I  
No. 226 Sqn. - Battles I

Boscombe Down

No. 88 Sqn. - Battles I  
No. 218 Sqn. - Battles I

Andover

R.A.F. Staff College

No. 2 Group - H.Q. Wyton, Hunts.

Bassingbourn

No. 104 Sqn. - Blenheim I  
No. 108 Sqn. - Blenheim I

Wyton

No. 114 Sqn. - Blenheim I  
No. 139 Sqn. - Blenheim I

Cranfield

No. 62 Sqn. - Blenheim I  
No. 82 Sqn. - Blenheim I

Cottesmore

No. 35 Sqn. - Battles I  
No. 207 Sqn. - Battles I

Upper Heyford

No. 18 Sqn. - Blenheim I  
No. 57 Sqn. - Blenheim I

Upwood

No. 52 Sqn. - Battles I  
No. 63 Sqn. - Battles I

Hucknall - No. 98 Sqn. - Battles I

No. 3 Group - H.Q. Mildenhall

Mildenhall

No. 99 Sqn. - Wellington Ic  
No. 149 Sqn. - Wellington Ic

Feltwell

No. 37 Sqn. - Wellington Ic  
No. 214 Sqn. - Wellington Ic

Stradishall

No. 9 Sqn. - Wellington Ic  
No. 148 Sqn. - Wellington Ic

Honington

No. 75 Sqn. - Wellington Ic  
No. 215 Sqn. - Wellington Ic

Marham

No. 38 Sqn. - Wellington Ic  
No. 115 Sqn. - Wellington Ic

No. 4 Group - H.Q. Linton-on-Ouse, Yorks

Linton-on-Ouse

No. 51 Sqn. - Whitley I  
No. 58 Sqn. - Whitley I

Driffield

No. 77 Sqn. - Whitley I  
No. 102 Sqn. - Whitley I

Leconfield

No. 97 Sqn. - Whitley I  
No. 166 Sqn. - Whitley I

Dishforth

No. 10 Sqn. - Whitley I  
No. 78 Sqn. - Whitley I

/No. 5 Group -

No. 5 Group - H.Q. St. Vincents, Grantham, Lincs.

Finningley

No. 7 Sqn. - Hampden I  
No. 76 Sqn. - Hampden I

Scampton

No. 49 Sqn. - Hampden I  
No. 83 Sqn. - Hampden I

Hemswell

No. 61 Sqn. - Hampden I  
No. 144 Sqn. - Hampden I

Thornaby

No. 106 Sqn. - Hampden I  
No. 185 Sqn. - Hampden I

Waddington

No. 44 Sqn. - Hampden I  
No. 50 Sqn. - Hampden I

No. 6 Group - H.Q. Norwich

Wattisham

No. 107 Sqn. - Blenheim I  
No. 110 Sqn. - Blenheim I

Watton

No. 21 Sqn. - Blenheim I  
No. 34 Sqn. - Blenheim I

West Raynham

No. 90 Sqn. - Blenheim I  
No. 101 Sqn. - Blenheim I

R.A.F. Fighter Command - 27 August 1939

A.H.Q. - Stanmore, Middx.

A.O.C.-in-C. - Air Chief Marshal Sir Hugh C. T. Dowding, G.C.V.O.,  
K.C.B., C.M.G.

S.A.S.O. - Air Commodore K. R. Park, M.C., D.F.C.

No. 11 Group - H.Q. Uxbridge, Middx.

Biggin Hill

No. 3 Sqn. - Hurricane I  
No. 32 Sqn. - Hurricane I  
No. 79 Sqn. - Hurricane I

North Weald

No. 17 Sqn. - Hurricane I  
No. 56 Sqn. - Hurricane I  
No. 151 Sqn. - Hurricane I

Hendon

No. 24 Sqn. (Comm.) various types  
No. 600 (London) - Blenheim F.  
No. 601 (London) - Blenheim F.  
No. 604 (Middx.) - Blenheim F.

Debden

No. 29 Sqn. - Blenheim F.  
No. 85 Sqn. - Hurricane I  
No. 87 Sqn. - Hurricane I

Tangmere

No. 1 Sqn. - Hurricane I  
No. 43 Sqn. - Hurricane I

Hornchurch

No. 54 Sqn. - Spitfire IA  
No. 65 Sqn. - Spitfire IA  
No. 74 Sqn. - Spitfire IA

Kenley

No. 615 (Surrey) - Gladiator I

Hawkinge

No. 25 Sqn. - Blenheim F.

Castle Bromwich

No. 605 (Warwick) -  
 Gladiator I }  
 Hurricane I }

Northolt

No. 111 Sqn. - Hurricane I

Filton

No. 501 (Bristol) - Hurricane I

No. 12 Group - H.Q. Hucknall, Notts.Wittering

No. 23 Sqn. - Blenheim F.  
 No. 213 Sqn. - Gauntlets

Abbotsinch

No. 602 (Glasgow) - Spitfire IA

Church Fenton

No. 64 Sqn. - Blenheim F.  
 No. 72 Sqn. - Spitfire IA

Hooton Park

No. 610 (Cheshire) - still on  
 Hinds

Duxford

No. 19 Sqn. - Spitfire IA  
 No. 66 Sqn. - Spitfire IA

Speke

No. 611 (W. Lancs.) - Spitfire IA

Digby

No. 46 Sqn. - Hurricane I  
 No. 73 Sqn. - Hurricane I

Usworth

No. 607 (Durham) - Gladiator I

Turnhouse

No. 605 (Edinburgh) -  
 Gladiator I

Doncaster

No. 616 (S. Yorks) - Gauntlets

Hucknall

No. 504 (Notts.) - Hurricane I

Yeadon

No. 609 (W. Riding) - (Hinds  
 Spitfire IA)

Catterick

No. 41 Sqn. - Spitfire IA

No. 22 (A.C.) Group - H.Q. South FarnboroughOdiham

No. 4 (A.C.) Sqn. -  
 Lysander II  
 No. 13 (A.C.) Sqn. - Hectors  
 No. 53 (A.C.) Sqn. -  
 Blenheim B

Hawkinge

II No. 2 (A.C.) Sqn. - Hectors  
 No. 613 (Manchester) -  
 Lysander II

Andover

No. 59 (A.C.) Sqn. -  
 (Hectors  
 Blenheim B)

Old Sarum

No. 16 (A.C.) Sqn. - Lysander II  
 School of Army Co-operation

/Catterick

Catterick

No. 26 (A.C.) Sqdn. - Lysander

Cardiff

No. 614 (Glamorgan) - Lysander

Farnborough

No. 1 A/A Co-op. Unit

R.A.F. Training Command - 27 August 1939

A.H.Q. - Market Drayton, Shropshire

A.O.C.-in-C. - Air Marshal Sir Arthur M. Longmore, K.C.B., D.S.O.

No. 21 (Training) Group - H.Q. Cranwell, Lincs.

No. 13 F.T.S. - Drem

No. 15 F.T.S. - Lossiemouth

No. 14 F.T.S. - Kinloss

No. 8 F.T.S. - Montrose

R.A.F. College - Cranwell

No. 23 (Training) Group - H.Q. Grantham, Lincs.

No. 1 F.T.S. - Netheravon

No. 7 F.T.S. - Peterborough

No. 2 F.T.S. - Brize Norton

No. 9 F.T.S. - Hullavington

No. 3 F.T.S. - South Cerney

No. 10 F.T.S. - Tern Hill

No. 5 F.T.S. - Sealand

No. 11 F.T.S. - Shawbury

No. 6 F.T.S. - Little Rissington

No. 12 F.T.S. - Grantham

Central Flying School - Upavon

School of Navigation - Manston

No. 24 (Training) Group - H.Q. Halton Camp, Aylesbury

Martlesham - Aeroplane and Armament Experimental Establishment and many other Depots and Establishments at various places

No. 25 (Armament) Group - H.Q. Brize Norton, Oxfordshire

Manby - No. 1 Air Armament School

Eastchurch - No. 2 Air Armament School

Nos. 1 to 8 Armament Training Stations at various places.

No. 50 (Training) Group - H.Q. 11 Tavistock Place, W.C.1.

Nos. 1 to 34 Elementary and Reserve Flying Training Schools at various places in England

/Overseas Commands

Overseas Commands - 27 August 1939

R.A.F. Middle East - H.Q. Villa Victoria, Cairo

Heliopolis

No.113 Sqn. - Bomber - Blenheims  
No.208 (A.C.) Sqn. - Lysander I  
No.216 Sqn. - Bomber - Transport - Valentias

Helwan

No. 80 Sqn. - Fighter - Gladiator I

Khartoum

No. 47 Sqn. - Bomber - Wellesley II

Abu Sueir

No. 4 Flying Training School

Nairobi

No.223 Sqn. - Bomber - Wellesley II

Ismailia

No.33 Sqn. - Fighter - Gladiator I  
No.45 Sqn. - Bomber - Blenheims  
No.211 Sqn. - Bomber - Blenheims

Ramleh

No. 6 Sqn. - Bomber - Hardy with one flight on Gauntlets

Amman

No.14 Sqn. - Bomber - Wellesley II

Aden

No. 8 Sqn. - Bomber - Blenheims  
No.94 Sqn. - Fighter - Gladiator I

R.A.F. Iraq - H.Q. Habbaniya

Habbaniya

No.30 Sqn. - Bomber - Blenheims  
No.55 Sqn. - Bomber - Blenheims  
No.70 Sqn. - Bomber - Transport - Valentias

Shaibah - No. 34 Sqn. - Bomber - Blenheims

R.A.F. India - H.Q. Simla

Ambala

No.60 Sqn. - Bomber - Blenheims

Kohat

No.28 (A.C.) Sqn. - Audax  
No.27 Sqn. - Bomber - Blenheims

Risalpur

No. 5 (A.C.) Sqn. - Wapiti  
No.39 Sqn. - Bomber - Blenheims

Peshawar

No.20 (A.C.) Sqn. - Wapiti

Lahore - No. 31 Sqn. - Bomber Transport - Valentias

R.A.F. Far East - H.Q. Singapore

Tengah - No.11 Sqn. - Bomber - Blenheim I

AIRCRAFT TYPES AND PERFORMANCES - 1919 to 1939

APPENDIX VI

ROYAL AIR FORCE - FLEET AIR ARM TYPES (CARRIER BORNE)

Introduced	Type	Name	No. of crew	Speed at 5,000 ft	Radius of action at cruising speed	Armament
pre 1923	S.E. Fighter	Nightjar	1	Max - 97 kts Cruising - 85 kts	100 n. miles	Two front fire Vickers guns.
1924	S.E. Fighter	Flycatcher I	1	Max - 120 kts Cruising - 100 kts	140 n. miles	Two front fire Vickers guns - 4 x 20 lb. bombs below wings.
1931	S.E. Fighter Recce Land or floatplane	Osprey IV	2	Max - 154 kts Cruising - 98 kts	180 n. miles	One Vickers forward and one Lewis gun aft.
1932	S.E. Fighter	Nimrod I and II	1	Max - 162 kts Cruising - 130 kts	150 n. miles	Two front fire Vickers guns.
1938	S.E. Fighter and Dive bomber	Skua II	2	Max - 200 kts Cruising - 135 kts	330 n. miles	Four front fire Browning and one Lewis gun aft. One 500 lb. bomb and eight light bombs below wings.
pre 1923	S.E. Spotter <del>land or float plane</del>	Westland Walrus	3	Max - 95 kts Cruising - 75 kts	120 n. miles	1 front Vickers and one Lewis gun aft.
1924	S.E. Spotter land or floatplane	Bison II	3 or 4	Max - 99 kts Cruising - 80 kts	160 n. miles	One Lewis gun amidships.
1924	S.E. Spotter	Blackburn II	3 or 4	Max - 90 kts Cruising - 78 kts	95 n. miles	One Lewis gun aft.

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APPENDIX VI

FLEET AIR ARM TYPES - (contd.)

APPENDIX VI (contd.)

Introduced	Type	Name	No. of crew	Speed at 5,000 ft	Radius of action at cruising speed	Armament
pre 1923	S.E. Recce	Panther	2	Max - 97 kts Cruising - 80 kts	180 n. miles	One Lewis gun aft.
1924	S.E. Recce Land or floatplane	Fairey IIID	3	Max - 95 kts Cruising - 80 kts	240 n. miles	One 230 lb. bomb - one Vickers front and one Lewis gun aft.
1924	S.E. Spotter/ Recce	Seagull III Amphibian	3	Max - 97 kts Cruising - 80 kts	160 n. miles	One Lewis gun amidships.
1928	S.E. Spotter/ Recce	Fairey IIIF Mk.IIIB	3	Max - 98 kts Cruising - 85 kts	260 n. miles	500 lb. of bombs - one front Vickers and one Lewis gun aft.
1933	S.E. Spotter/ Recce	Seal	3	Max - 110 kts Cruising - 90 kts	280 n. miles	One front Vickers and one Lewis gun aft.
1936	S.E. Catapult Recce	Walrus I amphibian	3	Max - 110 kts Cruising - 85 kts	260 n. miles	500 lb. of bombs - two or three Vickers guns.
1937	S.E. Catapult	Seafox floatplane	2	Max - 110 kts Cruising - 95 kts	200 n. miles	Light bombs below wings - one Lewis gun aft.
pre 1923	S.E. Torpedo	Cuckoo I	1	Max - 92 kts Cruising - 75 kts	150 n. miles	One 18 inch Mk.IX Torpedo (1,100 lb.) - two guns.
pre 1923	S.E. Torpedo	Dart II	1	Max - 99 kts Cruising - 85 kts	115 n. miles	One 18 inch Mk.VIII Torpedo (1,420 lb.) or 1,000 lb. of bombs. Two guns.

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## FLEET AIR ARM TYPES - (contd.)

## APPENDIX VI (Contd.)

Introduced	Type	Name	No. of crew	Speed at 5,000 ft	Radius of action at cruising speed	Armament
1929	S.E. Torpedo	Ripon IIA	2	Max - 108 kts Cruising - 95 kts	147 n. miles	One 18 inch Mk.VIII or X Torpedo or 1,600 lb. of bombs. One Vickers front and one Lewis gun aft.
1934	S.E. Torpedo	Baffin	2	Max - 117 kts Cruising - 96 kts	180 n. miles	One 18 inch Mk.VIII or X Torpedo or 1,600 lb. of bombs. One Vickers front and one Lewis gun aft.
1935	S.E. Torpedo/ Spotter/Recce	Shark II	3 for recce 2 for torpedo	Max - 130 kts Cruising - 98 kts	280 n. miles	One 1,500 lb. torpedo or the equivalent in bombs. One Vickers front and one Lewis gun aft.
1936	S.E. Torpedo/ Spotter/Recce	Swordfish I	3 for recce 2 for torpedo	Max - 120 kts Cruising - 94 kts	245 n. miles	One 1,500 lb. torpedo or the equivalent in bombs. One Vickers front and one Lewis gun aft.
ROYAL AIR FORCE - MARITIME COASTAL TYPES						
pre 1923	T.E. Flying boat	F.2A	4	Cruising - 80 kts	270 n. miles	460 lb. of bombs - Four to seven Lewis guns.
pre 1923	T.E. Flying boat	F.5	4	Cruising - 75 kts	260 n. miles	920 lb. of bombs - Four Lewis guns.

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APPENDIX VI (Contd.)

## ROYAL AIR FORCE - MARITIME COASTAL TYPES - (contd.)

APPENDIX VI (Contd.)

Introduced	Type	Name	No. of crew	Speed at 5,000 ft	Radius of action at cruising speed	Armament
pre 1923	S.E. Floatplane	Fairey IIID	3	Cruising - 80 kts	176 n. miles	One 230 lb. bomb - One Vickers front and one Lewis gun aft.
1926	T.E. Flying boat	Southampton II	5	Cruising - 75 kts	345 n. miles	1,100 lb. of bombs - Three Lewis guns (bows and amidships).
1928	S.E. Torpedo landplane	Horsley	2	Cruising - 104 kts	245 n. miles	One Mk.VIII Torpedo - (1,420 lb.) One Vickers front and one Lewis gun aft.
1930	Three-engined Flying boat	Iris III	5	Cruising - 87 kts	211 n. miles	2,000 lb. of bombs - Three .303" guns (Bow, waist and tail).
1931	Three-engined Flying boat	Rangoon	5	Cruising - 83 kts	290 n. miles	1,000 lb. of bombs - One Lewis gun in bows and two amidships.
1934	Three-engined Flying boat	Perth	5	Cruising - 100 kts	350 n. miles	2,000 lb. of bombs - One 37 mm automatic and one .303" in bows, one .303" amidships and one in tail.
1935	T.E. Flying boat	Scapa	5	Cruising 105 kts	475 n. miles	1,000 lb. of bombs - One Lewis gun in bows and two amidships.

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APPENDIX VI (Contd.)

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## MARITIME COASTAL TYPES - (contd.)

APPENDIX VI (Contd.)

Introduced	Type	Name	No. of crew	Speed at 5,000 ft	Radius of action at cruising speed	Armament
1935	S.E. Torpedo landplane	Vildebeest III	3	Cruising - 90 kts	200 n. miles	One Mk.VIII Torpedo or 1,000 lb. of bombs. One Vickers front and one Lewis gun aft.
1935	Four engined Flying boat Twin Tandem	Singapore III	6	Cruising - 90 kts	425 n. miles	2,000 lb. of bombs - Three Lewis guns (bow, waist and tail).
1936	T.E. Flying boat	London II	6	Cruising - 93 kts	400 n. miles	2,000 lb. of bombs - One Lewis gun in bows and two amidships.
1936	T.E. Flying boat	Stranraer II	6	Cruising - 100 kts	475 n. miles	1,000 lb. of bombs - Three Lewis guns (bow, waist and tail).
1936	T.E. Amphibian Trainer	Cloud	2 plus 8 passengers	Cruising - 85 kts	170 n. miles	Four 50 lb. bombs - One gun in bow and one gun aft.
1936	T.E. G.R. landplane	Anson I	3	Cruising - 120 kts	280 n. miles	360 lb. of bombs - One .303" front and one .303" in turret.
1938	Four-engined Flying boat	Sunderland	10 to 13	Cruising - 137 kts	850 n. miles	2,000 lb. of bombs - One .303" front turret, two .303" waist guns and four .303" tail turret.
1939	T.E. G.R. landplane	Hudson I	5	Cruising - 165 kts	495 n. miles	1,000 lb. of bombs - Twin .303" front, twin .303" in dorsal turret and one .303" ventral position.

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APPENDIX VI (Contd.)

Introduced	Type	Name	No. of crew	Max. Speed	Height Feet	Radius of action at economic speed Land miles	Armament
Pre 1923	T.E. Bomber	Vimy IV	3	96 m.p.h.	10,000	450	2,476 lb. of bombs - Twin Lewis guns in nose and amidships.
Pre 1923	S.E. Bomber	DH.9A	2	114 m.p.h.	10,000	254	460 lb. of bombs - One Vickers front and one Lewis aft.
1924	S.E. Bomber	Aldershot I	3	110 m.p.h.	2,000	325	2,000 lb. of bombs - One Lewis gun aft.
1924	S.E. Bomber	Fawn III	2	112 m.p.h.	10,000	325	460 lb. of bombs - One Vickers front and one Lewis aft.
1924	T.E. Bomber	Virginia IV	4	93 m.p.h.	8,000	275 510	with 2,900 lb. of bombs - One Lewis gun in nose. with 1,000 lb. of bombs - Twin Lewis guns in tail.
1926	S.E. Bomber	Horsley II	2	126 m.p.h.	10,000	270 315	520 lb. of bombs - One Vickers front and one Lewis aft. 336 lb. of bombs.
1926	S.E. Bomber	Fox I	2	150 m.p.h.	10,000	250	460 lb. of bombs - One Vickers front and one Lewis aft.

## BOMBER, FIGHTER AND ARMY CO-OP TYPES (contd.)

APPENDIX VI (Contd.)

Introduced	Type	Name	No. of crew	Max Speed	Height Feet	Radius of action at economic speed Land miles	Armament
1926	T.E. Bomber	Hyderabad I	4	110 m.p.h.	8,000	245 395	with 2,000 lb. of bombs - Three Lewis guns (nose, dorsal and ventral). with 1,000 lb. of bombs.
1927	S.E. Bomber General Purposes	Fairey IIIIF	2	120 m.p.h.	10,000	200 760	with 500 lb. of bombs - One Vickers front and one Lewis aft. with no bombs and extra petrol.
1928	T.E. Bomber	Sidestrand III	3 or 4	140 m.p.h.	10,000	250	1,050 lb. of bombs - Three Lewis guns (nose, dorsal and ventral).
1928	S.E. Bomber General Purpose	Wapiti IIA	2	135 m.p.h.	5,000	360	500 lb. of bombs - One Vickers front and one Lewis aft.
1929	T.E. Bomber	Hinaidi II	4	115 m.p.h.	10,000	425	1,448 lb. of bombs - Three Lewis guns (nose, dorsal and ventral).
1930	S.E. Bomber	Hart	2	172 m.p.h.	10,000	235	500 lb. of bombs - One Vickers front and one Lewis aft.
1930	S.E. Bomber	Gordon I	2	145 m.p.h.	3,000	300	460 lb. of bombs - One Vickers front and one Lewis aft.

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APPENDIX VI (Contd.)

## BOMBER, FIGHTER AND ARMY CO-OP TYPES - (contd.)

APPENDIX VI (Contd.)

Introduced	Type	Name	No. of crew	Max. Speed	Height Feet	Radius of action at economic speed Land miles	Armament
1934	T.E. Bomber	Heyford 1A	4	142 m.p.h.	13,000	460	2,800 lb. of bombs - Three Lewis guns (nose, dorsal and ventral).
1934	S.E. Bomber General Purpose	Wallace II	2	158 m.p.h.	15,000	290	580 lb. of bombs - One Vickers front and one Lewis aft.
1934	S.E. Bomber General Purpose	Vincent	3	140 m.p.h.	5,000	310	1,000 lb. of bombs - one Vickers front and one Lewis aft.
1935	S.E. Bomber	Hind I	2	186 m.p.h.	16,000	215	500 lb. of bombs - One Vickers front and one Lewis aft.
1935	T.E. Bomber	Overstrand I	5	153 m.p.h.	6,500	275	1,600 lb. of bombs - Three Lewis guns (nose, dorsal and ventral).
1935	S.E. Bomber General Purpose	Hardy I	2	164 m.p.h.	5,000	225	Two 112 lb. bombs - One Vickers front and one Lewis aft.
1936	T.E. Bomber	Hendon II	5	155 m.p.h.	15,000	680	1,660 lb. of bombs - Three Lewis guns (nose, dorsal and tail).
1937	T.E. Bomber	Blenheim I	3	260 m.p.h.	8,000	560	1,000 lb. of bombs - One Browning front and one Vickers dorsal turret.

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APPENDIX VI (contd.)

## BOMBER, FIGHTER AND ARMY CO-OP TYPES - (contd.)

APPENDIX VI (Contd.)

Introduced	Type	Name	No. of crew	Max. Speed	Height Feet	Radius of action at economic speed Land miles	Armament
1937	T.E. Bomber	Whitley I	5	192 m.p.h.	7,000	625	3,000 lb. of bombs - One .303" in nose turret - Four .303" in tail turret
1937	T.E. Bomber	Harrow II	5	200 m.p.h.	10,000	625	3,000 lb. of bombs - Four .303" in turrets (nose, dorsal and tail).
1937	S.E. Bomber General Purpose	Wellesley II	2	228 m.p.h.	19,000	550	2,000 lb. of bombs - One Vickers front and one Vickers aft.
1937	S.E. Bomber	Battle I	3	240 m.p.h.	13,000	500	1,000 lb. of bombs - One Browning front and one Vickers aft.
1938	T.E. Bomber	Wellington IC	6	235 m.p.h.	15,000	600 1,200	with 4,500 lb. of bombs - Twin .303" in nose and tail turrets. with 1,000 lb. of bombs - Two .303" in beam positions
1938	T.E. Bomber	Hampden I	4	254 m.p.h.	13,000	600 940	with 4,000 lb. of bombs - Twin .303" in nose, dorsal and ventral turrets. with 2,000 lb. of bombs.
pre 1923	S.E. Fighter	Snipe	1	120 m.p.h.	10,000	142	Four 20 lb. bombs - Two Vickers front guns.
1924	S.E. Fighter	Grebe II	1	145 m.p.h.	10,000	150	Two Vickers front guns.

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APPENDIX VI (Contd.)

## BOMBER, FIGHTER AND ARMY CO-OP TYPES - (contd.)

APPENDIX VI (Contd.)

Introduced	Type	Name	No. of crew	Max. speed	Height Feet	Radius of action at economic speed Land miles	Armament
1924	S.E. Fighter	Siskin III	1	131 m.p.h.	10,000	124	Two Vickers front guns.
1925	S.E. Fighter	Gamecock I	1	145 m.p.h.	10,000	150	Two Vickers front guns.
1925	S.E. Fighter	Woodcock II	1	135 m.p.h.	10,000	200	Two Vickers front guns.
1929	S.E. Fighter	Bulldog II	1	174 m.p.h.	10,000	200	Four 20 lb. bombs- Two Vickers front guns.
1932	S.E. Fighter	Fury I	1	207 m.p.h.	14,000	150	Two Vickers front guns.
1933	S.E. Fighter	Demon	2	182 m.p.h.	16,000	200	Light bombs under wings - Two Vickers front and one Lewis gun aft.
1935	S.E. Fighter	Gauntlet I	1	230 m.p.h.	15,000	230	Two Vickers front guns
1937	S.E. Fighter	Gladiator I	1	253 m.p.h.	14,000	220	Four Browning front guns.
1938	S.E. Fighter	Hurricane I	1	322 m.p.h.	17,000	230 480 with aux. tanks	Eight .303" front guns.
1938	S.E. Fighter	Spitfire IA	1	355 m.p.h.	19,000	250	Eight .303" front guns.
pre 1923	Army Co-op S.E.	Bristol Fighter II	2	105 m.p.h.	10,000	150	448 lb. of bombs. One Vickers front and one Lewis aft.
1924	T.E. Troop Carrier and bomber	Vernon	3	100 m.p.h.	5,000	135 370	with 10 troops. with 3 troops.

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APPENDIX VI (Contd.)

## BOMBER, FIGHTER AND ARMY CO-OP TYPES - (contd.)

APPENDIX VI (Contd.)

Introduced	Type	Name	No. of crew	Max. Speed	Height Feet	Radius of action at economic speed Land miles	Armament
1926	T.E. Troop Carrier and bomber	Victoria V	2	93 m.p.h.	5,000	154 320	with 22 troops. with 11 troops.
1927	S.E. Army Co-op	Atlas I	2	135 m.p.h.	10,000	240	Four 112 lb.bombs. One Vickers front and one Lewis aft.
1932	S.E. Army Co-op	Audax I	2	170 m.p.h.	3,000	260	Two 112 lb bombs. One Vickers front and one Lewis aft.
1934	T.E. Troop Carrier and bomber	Valentia	2	130 m.p.h.	5,000	400	2,200 lb. of bombs or up to 22 troops.
1937	S.E. Army Co-op	Hector I	2	187 m.p.h.	6,000	200	Two 112 lb. of bombs -One Vickers front and one Lewis aft.
1938	S.E. Army Co-op	Lysander I	2	229 m.p.h.	10,000	300	Six light bombs - Two .303" front Two .303" aft.

References for figures:- A.H.B./IIA/156 encl.6 and ID2/133 encl. 29  
 British Naval Aircraft - 1912 to 1958)  
 Aircraft of the R.A.F. - 1918 to 1958) by Owen Thetford

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APPENDIX VI (Contd.)

THE COMMITTEE OF IMPERIAL DEFENCE

History, Functions and Authority

Reference: A.H.B./ID2/68(A) - pages 6 to 12  
and ID2/68(B) - pages 31 to 42  
and C.I.D. 696B

The genesis of the Committee was the old Defence Committee of the Cabinet which was set up in 1899 under the chairmanship of the Duke of Devonshire on the formation of the first Lord Salisbury's third Administration. After the South African War it was remodelled in 1902 to include both the political and professional heads of the Army and Navy. Early in 1904, in view of the current reform of the War Office, a further reconstitution of the existing Defence Committee was urged and stress was laid on the necessity of the Prime Minister himself being its invariable President. The recommendations were accepted by the Government and the Committee of Imperial Defence came into being. It was formally created by a Treasury Minute dated 4 May 1904. It was constituted as an advisory committee to be summoned by the Prime Minister instead of organising it as a permanent body. In practice, the Ministers responsible for the Treasury, Foreign, Colonial, India, Admiralty and War Offices were always summoned. The Ministers in charge of other Departments were also summoned when any subject concerning their Departments was under discussion. In addition, other Ministers, Officers or experts on particular questions could be summoned to the meetings of the Committee. Apart from the appointment of the Prime Minister as Chairman, the principal change made in 1904 was the creation of a Permanent Secretariat.

The duties of the Secretariat were as follows:-

- (1) To preserve a record of the deliberations and discussions of the Committee.
- (2) To collect and co-ordinate, for the use of the Committee, information bearing on the wide problem of Imperial Defence, and to prepare or arrange with Departments for the preparation of any memoranda required for the Committee.
- (3) To make possible a continuity of method in the treatment of the questions which from time to time might come before the Committee.

During the 1914/18 War, the Committee developed first into a War Council, then through stages into a War Committee, a War Cabinet, an Imperial War Cabinet, the Supreme War Council and finally extended after the War into the Peace Conference and the subsequent International and Imperial Conferences. The Prime Minister (Mr. Lloyd George) was so preoccupied with first the Peace Conference and later with pressure of reconstruction arising out of the war that he was unable to hold regular meetings of the Committee and on 29 June 1920 it was decided to set up a Sub-Committee composed of the following:-

The Prime Minister (ex officio) in the Chair  
The First Lord of the Admiralty  
The First Sea Lord  
The Secretary of State for War  
The Chief of the Imperial Staff  
The Under Secretary of State for Air  
The Chief of the Air Staff

for the discussion of such questions as might from time to time be referred to it by the Committee of Imperial Defence.

However, the pressure of work on the Prime Minister continued to be as great as, if not greater than ever and nearly a year elapsed without any further meetings taking place either of the main or the sub committee. In April 1921, therefore, the Prime Minister asked the Lord President of the Council (Mr. A. J. Balfour) to take the Chair on his behalf at the new Sub-Committee, which was now termed the Standing Defence Sub-Committee and to which the Prime Minister decided to refer the current work of the Committee of Imperial Defence.

It was soon discovered that the original membership of this Standing Sub-Committee was inadequate for the problems raised were found to involve many other Departments. The practice grew up, therefore, of inviting representatives of the other Departments to attend according as the nature of the business required and the tendency was for the procedure of the Standing Defence Sub-Committee to approximate more and more closely to that of the Committee of Imperial Defence. When Mr. Bonar Law's Government came into office in October 1922, he asked the new Lord President of the Council (the Marquess of Salisbury) to take the Chair at the Standing Defence Sub-Committee. Occasionally it was found necessary to reserve large questions of principle for the full Committee of Imperial Defence. But up to 31 March 1924 such meetings amounted to only seven as against thirty-one meetings by the Standing Defence Sub-Committee.

While these two Committees provided the medium for discussing the larger questions of Defence Policy, there were a number of Standing Sub-Committees for discussion of inter-departmental defence questions of detail. These included Overseas Defence, Home Defence, Imperial communications, Co-ordination on permanent armaments and Co-ordination of Action Sub-Committees. In addition, many of the detailed investigations of the Main Committee were carried out by sub-committees appointed ad hoc.

Neither the Committee of Imperial Defence nor any of the Sub-Committees mentioned above had power of initiative or executive. All were advisory only and any conclusions reached which required executive action were carried out under the directions and on the responsibility of the Minister in charge of the Department concerned. But by reason of its Cabinet content the conclusions of the Main Committee were invariably endorsed by the Government.

When the suggestion of creating a Defence Ministry to replace the Committee of Imperial Defence as a co-ordinating authority came up before Lord Salisbury's Sub-Committee in the summer of 1923, careful consideration led to the conclusion that a Defence Ministry was undesirable and impracticable, and that an alternative plan for the amalgamation of the three Service Departments was equally unworkable. On the other hand it was recommended that the membership of the Main Committee of Imperial Defence should be increased to include the Chiefs of Staff of the three Fighting Services and henceforth should consist of the following:-

- The Prime Minister - President
- The Chairman - (deputy to the Prime Minister)
- The Secretary of State for War
- The Secretary of State for Air
- The First Lord of the Admiralty
- The Chancellor of the Exchequer or the Financial Secretary

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The Secretary of State for Foreign Affairs  
The Secretary of State for the Colonies  
The Secretary of State for India  
The three Chiefs of Staff of the Fighting Services  
The Permanent Secretary of the Treasury (as head of the Civil Service)

In addition to these, other British or Dominion Ministers of the Crown and other officials or persons having special qualifications would be summoned as members by the President according to the nature of the business. The functions of the Chairman would be:-

- (i) to preside in the absence of the Prime Minister
- (ii) To report to the Prime Minister and to the Cabinet the recommendations of the Committee.
- (iii) In matters of detail to interpret the decisions of the Prime Minister and the Cabinet.
- (iv) Assisted by the three Chiefs of Staff to keep the defence situation as a whole constantly under review and ensure that defence plans and preparations were co-ordinated, and that full information as to the changing naval, military and air situation might always be available to the Committee, and to submit resolutions as to the requisite action considered desirable.

The functions of the Chiefs of Staff would include individual and collective responsibility for advising on Defence Policy as a whole, constituting in effect a Super-Chief of a War Staff. In carrying out this function they will meet together in a Chiefs of Staff Committee for the discussion of questions which affected their joint responsibilities. The Standing Defence Sub-Committee should be suppressed and its past proceedings merged into those of the Committee of Imperial Defence.

All these conclusions and recommendations were adopted by the Government and presented to Parliament in August 1923 (Cmd. 1938).

Later, in 1926, the question of emphasising the individual and collective responsibility of the Chiefs of Staff for advising on defence policy as a whole was settled by issuing a warrant, signed by the Prime Minister, formally laying down their responsibilities in this respect. This was done on 16 June 1926. At the same time the Chiefs of Staff started issuing periodic reviews of our defensive situation as a whole, for consideration by the Committee of Imperial Defence and the Cabinet. Such a conspectus proved of great value in enabling the Committee to decide what questions required investigation, in settling questions of priority, and in providing a background for comparing estimates, effecting economies and considering questions of detail.

By June 1926, the number of Standing Committees had increased and included those on Man-Power, Service Supplies, Disarmament, Blockade, Censorship, Oil fuel, Air Raid Precautions, Anti-Aircraft Research, War Emergency Legislation and Insurance.

TYPES OF BOMBS IN THE R.A.F. - 1922 to 1939

After the 1914-1918 War the R.A.F. was left with large stocks of aircraft bombs which were a mixed collection of shapes and sizes with many different methods of construction and fuzing. Between 1921 and 1922 considerable discussion took place between the Air Staff and the various departments connected with armament research and development as to the formulation of policy regarding bombs and the trend of future developments.

The General Purpose Bomb

Included in the development programme approved in April 1922 was the General Purpose (G.P.) series. In these early deliberations there was no mention of performance requirements, matters being confined to policy of types and weights, and size in relation to the contemporary aircraft. After investigations lasting until October 1923 the shape of the new G.P. bombs (50 lb., 250 lb., and 500 lb.) was settled and in December the Design Department, Woolwich was asked to prepare designs. Early in January 1924 an Air Staff requirement was stated for a 120 lb. bomb, so as to give a greater variety of bomb load. There were thus four bomb sizes required, the Ordnance Committee being so informed in January 1924. By May 1924 the designs had been completed and trial bombs of each size were being manufactured at Woolwich Arsenal for experiments.

A number of difficulties were encountered in the early production and it was not till 1925 that sufficient inert filled bombs of 250 and 500 lb. were ready for ballistic trials. Although much research remained to be done, there was anxiety about the low state of bomb stocks and in July 1925 the C.A.S. decided that the 120 lb, 250 lb. and 500 lb. bombs should go into quantity production so as to bring bomb stocks up to six months war reserve - the 50 lb. bomb was to be redesigned. Thus the first G.P. bombs Mark I series came into service towards the end of 1925. In the G.P. type bomb the charge/weight ratio averaged 23 per cent and the filling was 80/20 Amatol.

Meanwhile, as a result of suggestions by the D.C.A.S. in November 1924, it was decided to go ahead with designs of larger G.P. bombs (1,000 to 4,000 lb) in anticipation of the production of aircraft capable of carrying them. By July 1927 the design for a 1,000 lb bomb had been approved for experimental production and by the end of 1927 the Air Staff decided that only the 1,000 lb. and a 2,000 lb. size were for the time being to be developed, the latter in any case having to await successful trials of the former. By May 1928 some experimental 1,000 lb bombs were successfully tried out at the Shoeburyness testing range. The next three years were taken up in comparative trials with different fillings and improvements in the construction of the bomb at which point, after discussions lasting from June 1931 till July 1932, the Air Staff decided that current aircraft design was unlikely in the near future to be able to carry the bomb and only three sizes of G.P. bombs were required (the 120 lb, the 250 lb. and the 500 lb). Thus after seven years of careful and thorough work, when the design had passed all tests except that of live dropping, the production of the larger bombs was shelved.

It was not revived until June 1938 when the re-introduction of bombs of 1,000 lb. and over was recommended by the Air Staff for air attack on such targets as dams, aqueducts and canals. This requirement was enthusiastically supported by the A.O.C.-in-C. Bomber Command and

in December 1938 it was agreed that the 1,000 lb G.P. bomb should be produced as soon as possible but neither this bomb nor the 2,000 pounder came into service until 1940.

The Armour Piercing Bomb

Following the First World War, investigations into the results of gun bombardment of enemy ships and armoured land targets with armour piercing projectiles showed the need in future conflicts for an aerial missile capable of piercing deck armour and exploding after penetration. It was with this in mind that the Design Department produced in 1921 a proposed design of an armour piercing bomb 11 inches in diameter and weighing approximately 750 lb. The design was based on an assumed release from 6,000 to 8,000 feet from which height it was calculated that it would penetrate a 3 inch hardened steel plate. Copies of the design were sent to armament firms inviting specifications and quotations for an A.P. bomb on these lines. Four designs were submitted and discussed by the Ordnance Committee on 13 March 1922. It was decided to limit the maximum weight to 500 lb, so the designs of the 11 inch bomb were proportionately reduced to weigh about 435 lb and orders were given for trial bombs. These were made with varying explosive capacities - 6%, 13% and 19%. Fragmentation trials established the superiority of the 13% filling and in the subsequent plating trials this bomb achieved penetration of a 3 inch nickel-chrome plate on 7 May 1923. For the next year there were experiments in different kinds of explosive for the filling and during July/August 1924 trials were carried out with T.N.T. filling against a target representing a ship's upper deck with a 4 inch armour deck beneath it. The bomb achieved penetration but only with a much increased striking velocity which corresponded to a free release at 20,000 feet. However, the major phase in development, power of penetration and fragmentation, was complete and it remained only to discover the best ballistic shape, perfect a reliable fuze and settle the method of carriage and release in an aircraft. These were satisfactorily completed in November 1925 and the Mark I 450 lb A.P. bomb was accepted. It was not until August 1928 that the bomb specification actually appeared. Small orders had been given to various private firms and the bombs thus produced were subjected to further examinations and tests. The Mark I bomb made its final appearance in Naval trials between September and November 1930 to test the efficiency of new strengthened deck armour and fragmentation effectiveness when detonated between-decks. Meanwhile the Mark II had just been approved. This Mark was a modified Mark I evolved in order to overcome certain weaknesses inherent in the tail portion. Manufacture of it started in September 1930 but only on a low priority. After rather inconclusive trials against the target ship Marlborough,<sup>(1)</sup> the design and filling was approved in March 1932. Heavier deck armour was by now being fitted in existing capital ships and even heavier protection was projected in future battleship design. The bomb was plainly unequal to the new task and in July 1932 the Air Staff agreed that the requirement had ceased to exist and the whole 450 lb A.P. series was abandoned.

The need for a much heavier bomb had been foreseen and as early as 1924 models of a 1,500 lb A.P. bomb were constructed. Early in 1927, trials with two inert bomb bodies were held at Shoeburyness. These were unsatisfactory and the design was changed to a longer bomb of only 12 inches in diameter instead of 15 inches. At a meeting held in the Admiralty on 18 January 1928 it was decided to re-design the bomb to

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(1) Admiralty fears due to the possibility of the bomb sinking the ship prevented a 'live drop' and the bomb was only detonated at rest in a position between decks.

weigh 2,000 lb. but to continue with the 1,500 lb bomb for trials data which would be of great value for the development of the heavier missile. Trials during 1928 established adequate penetration standards by the 1,500 pounder but the years 1929, 1930 and most of 1931 were taken up with further plate trials and many minor modifications. By November 1931, only the method and type of filling was still outstanding and in this condition the 'empty' Mark I 1,500 lb. A.P. bomb was approved. However, there was no subsequent Air Staff requirement for it and nothing further was heard of this bomb until June 1941 when the Admiralty requested that twenty should be manufactured for trial purposes. In October 1942 the Naval Staff stated that their requirement would be met by either the 2,000 lb. A.P. or the American 1,600 lb. A.P. and the 1,500 lb. development item was deleted from the programme.

As mentioned above, the 2,000 lb A.P. bomb was first designed in 1928. During the next four years many types were made and numerous trials conducted so that it was May 1932 before the complete designs of the empty 2,000 lb. bomb were approved. Then in July 1932 came the Air Staff decision to limit the weight of all individual aircraft bombs to a maximum of 500 lb which resulted in the abandonment of all A.P. bomb development. It was not until four years later, with the improvements in aircraft construction and the development of new bombsights, that on 31 May 1936 the C.A.S. authorised further development and the 2,000 lb. size was adopted as the heavy armour piercing bomb. There was much final development and many investigations necessary before production could start. Finally a contract for a limited supply was placed and in March 1938 ballistic satisfaction was confirmed in full scale tests with an inert bomb. The filling, both type and method, was not finalised until 23 September 1939 and the fuze question not till 1941. The 2,000 lb A.P. bomb was not introduced into service until February 1942.

#### The Semi-Armour Piercing Bomb

The first requirement for this type occurred during the development of the 450 lb A.P. bomb when at a conference held at the Admiralty on 17 July 1924 the Air Ministry agreed to produce a new design for a G.P. bomb with a solid nose capable of perforating a  $1\frac{1}{2}$  inch plate. Subsequently it was decided to develop two new types of bomb - a 250 lb. and a 500 lb with solid noses for use against the decks of capital ships and two of similar weight for use against submarines. Regarding the former type, sketch designs were forwarded and accepted by the Ordnance Committee on 20 February 1925 and six 250 lb. bombs, now termed semi-armour piercing (S.A.P.) were ordered for experimental firing trials. These established the penetration to be successful against plates up to  $2\frac{1}{2}$  inches and in March 1927 an order was given for four 500 lb. bombs for confirmatory tests. These took place at Shoeburyness in December of the same year and gave similar results so from early 1928 the development of both sizes proceeded along the lines necessary for effective filling, fuzeing and the production aspect. In June 1929 these were concluded and the Mark I S.A.P. bomb in the two weights was approved for manufacture. Further trials and modifications followed resulting in a Mark II model as well as with slightly different filling ingredients and it was not till March 1931 that the Marks I and II of both weights were introduced into the Service and production orders placed.

With the exception of bombs used in initial ballistic trials, the first occasion on which S.A.P. bombs were dropped from aircraft was in the trials against the Marlborough and the 'Chatham Float' in February 1932.

The Anti-Submarine Bomb

It had been the considered opinion at the end of 1917 that the optimum weapon of air attack against submarines was a bomb containing at least 300 lb of explosive. This had been standardised in a light casing giving a total weight of 520 lb and fitted with an impact fuze in the case of a direct hit and a delay fuze which detonated at about 40 feet after entering the water.

See Chap. II  
(xiv)

For various reasons the interest taken in direct air attack on submarines lapsed after the war. This was mainly due to the fact that the maritime element of the R.A.F., both shorebased and shipborne, was trained exclusively for work with the Fleet and the Admiralty policy required this to consist of sea reconnaissance, gunnery spotting and air torpedo attack. Anti-submarine duties, when mentioned, were limited to sighting and reporting for the benefit of the surface forces. The lack of interest in the air attack of submarines was furthered in the minds of the Air Staff by the naval claims for ASDIC, the new underwater locating device, and the continual political efforts to have submarines universally proscribed as a weapon of war.

However, at the conference at the Admiralty mentioned in the S.A.P. bomb section which was held on 17 July 1924, a requirement was agreed upon for the production of two sizes of light case bombs (250 and 500 lb) for use against submarines. A year later the Admiralty asked for a third bomb of this kind to weigh 100 lb. This was purely a naval requirement but it marked the beginning of a long controversy about the best size of anti-submarine bomb. It was realised that the chances of hitting a difficult target like a submarine in the act of or having just submerged would be increased by releasing two or more bombs at the same time, either as a salvo relying on natural spread or in quick succession. The first problem, faced in the days of very limited aircraft load capacity, was what constituted the smallest bomb worth using. At a further Bomb Conference in 1925 the Admiralty decided that they would not require the larger sized bombs but the Air Staff decided to retain them and the designs for all three sizes went concurrently with priority given to the 100 lb. The charge/weight ratio in each size was 52%, later increased to 62%.

By the end of 1926, six 100 lb bombs had been produced for trials. Five of these, filled with T.N.T., were dropped from 4,000 feet and four detonated successfully. The sixth bomb was sent to Shoeburyness in May 1927, for observed detonation under water but the effect was measured only by examination of the fragments and, though no kind of target was used, it was reported as satisfactory. Considering that the bomb was being designed to combat what in the recent war had been our greatest single menace, it is strange that no efforts were made at this stage of design to measure the effect of detonation on the structure of a submarine.

The question of the best type of filling occupied the rest of 1927 and as no finality was reached only the design of the empty bomb was approved in May 1928 as the Mark I 100 lb Anti-Submarine Bomb. However, it was soon found necessary to strengthen the body and the consequent re-design was not successfully tested as the Mark II bomb until July 1930. Further objections to the filling procedure were raised which foreshadowed the necessity in the future of a new Mark III. However, without

waiting for this the Marks I and II were introduced into service in March 1931. It is significant that, up to that date, no trials to test the value of the bomb against the structure of a submarine had even yet been made. Still more lamentable, no scientific investigation of the bomb's behaviour under water had been organised.

Meanwhile the Air Council had been proceeding with the development of the 250 and 500 lb bombs. Four experimental bombs of each size were produced by the Ordnance Factory at Woolwich for initial dropping trials. These took place in October 1928 from heights of 1,000 and 5,000 feet, and all bombs except one detonated successfully. In 1929 a new design was produced with modifications to give more strength and lightness to nose construction under the name of Mark II. Fragmentation trials should then have been made at Shoeburyness but the next two years were spent in spasmodic fuze trials which exhausted the small stock of experimental bombs; in arguments about the type of filling; and in details of design of such parts as the suspension lug and the welding of the nose. The period was one of confusion and indecision, and, although small quantities of both Marks I and II were produced, no settled progressive policy was forthcoming and further development of the bomb virtually ceased until 1934. In that year the Ordnance Committee was approached with an application to revise the design of the whole Anti-Submarine series.

The new designs were complete by July 1934 and about the same time the Air Staff were investigating into reserves of bombs for a possible major war. The need for such reserves of Anti-Submarine bombs made it imperative that orders should be placed at once. The new design was untried, but as it appeared a great improvement on the older designs, it was decided to place all future orders for the new design (Mark III) in the three sizes.<sup>(1)</sup> The year 1934 is notable for it saw the start of essential but belated experiments by R.A.E. to determine the underwater behaviour of the bomb.<sup>(2)</sup> These revealed that the anti-submarine fuze (No. 32) was not only unreliable in action and disturbing in its effect on the path of the bomb under water but, because of the complication of its mechanism, was extremely difficult to manufacture in large quantities. Development of this fuze had started in 1923 but the complex requirements, made by the Naval and Air Staffs had made it the most complicated ever designed. The August 1935 trials by the R.A.E. proved that even if the fuze could be made fairly reliable a bomb so fitted would, due to its hopelessly irregular underwater path, be almost completely useless.

By 1936 the Fleet Air Arm requirement had risen to 5,000 bombs and the Director of Naval Ordnance decided that a simpler fuze would have to be designed, at any rate for the 100 lb bomb, which was the chief naval requirement. The trouble with the original bomb and its fuze was that too much had been asked of it. The Ordnance Committee and representatives of all branches concerned met in August 1936 and decided that a new bomb and fuze must be designed and at extreme urgency. Accordingly a new design was produced in September which was approved by R.A.E. and twenty bombs were manufactured for trial. None of these were ready by

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(1) The quantities required were:-

100 lb	.....	1,700
250 lb	.....	14,550
500 lb	.....	5,715

(2) During the next six years these brought to light failures in every fuzeing method tried coupled with unpredictable and erratic underwater travel resulting in a quite useless weapon when war broke out.

/March

SECRET

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APPENDIX VIII (Contd.)

March 1937. Tests of both inert and live drops at various heights into the sea at Shoeburyness resulted in complete failure due to faulty pistol design. A re-design was tried again in both 100 lb and 250 lb bombs in December and again failed. Further alterations were made but trials in April and June 1938 were still not completely successful. A sharpened striker and more sensitive detonator were then fitted and this time the tests of twenty-two bombs (100, 250 and 500 lb) from 500 and 4,000 feet were completely successful. In October arrangements were made for the immediate production of 50 of each size of bomb under the title of Mark IV.

By May 1939 this order had been completed and the bombs filled at Woolwich, a quantity being sent to Martlesham and Felixstowe for live dropping trials. Once more these proved not wholly satisfactory and further trials were suspended pending an examination of the detonators. Meantime production orders for the new bomb had been placed and some were in service when the war broke out. They were not a success and the first four months of 1940 were spent in an investigation into frequent failures of the Mark IV bomb experienced by the Fleet Air Arm.

Thus at the time when war broke out in September 1939 the shore based maritime aircraft of Coastal Command and the Overseas Commands went in to attack enemy submarines with an inferior weapon. It is true that a direct hit on a surfaced submarine with the larger A/S bombs was likely to be fatal (but so would one be with a G.P. bomb). Against the diving U-boat, which during the early years of the war was the only target, the three sizes of Anti-submarine bomb were quite useless and very belatedly the depth charge was adopted as the proper weapon in 1940.

THE BUOYANT or B-BOMB

Ref: R.A.F. Armament Vol. I <sup>(1)</sup>

During 1923, extensive investigations went forward at the Air Ministry laboratory on an earlier but abandoned project. The idea was to construct a bomb for release ahead of ships so that after its downward travel on entering the water, it would by its buoyancy rise towards the surface and, fitted with a suitable fuze, would explode at a predetermined depth underneath the bottom of the approaching ship. By July 1923 a preliminary report was prepared giving theoretical figures for underwater trajectory, maximum depth reached, and delay necessary to detonate on its upward path at 35 feet. Experiments with models in a water tank confirmed these figures. Full scale trials using a 520 lb. bomb case were put in hand. The report also outlined the advantage of this form of attack and made the claim that the new bomb might be considered as 15 times more damaging than an ordinary H.E. bomb of the same weight. Figures were given for the best point of aim ahead of the ship and some suggestions for mechanical design were added. At this time the idea of a fixed delay before detonation was uppermost but later the bomb was fitted with sensitive horns like a mine so that the ship herself might cause the detonation.

During 1924 a new body was designed by the Air Ministry laboratory which was a cylindrical case 9 feet long by 18 inches in diameter with a conical head and drum tail of diameter 27 inches, the whole to weigh 1,000 lbs. when filled. At this time the Admiralty began to be interested and the Naval Director of Scientific Research asked for details and a 1/40th scale model, which were duly supplied. With the latter, experiments were conducted which established that there was no "sweeping away" effect by the disturbed water beneath and surrounding a moving ship which would prevent a B-Bomb from hitting its bottom.

(1) A.H.B./II/116/4(A)

/Meanwhile

Meanwhile four full scale bombs were completed by January 1925 and sent to Gosport where the future experiments would be undertaken. Furthermore, experiments with the model bomb were carried out in the Admiralty testing tank at H.M.S. Vernon, the Mining and Torpedo Establishment at Portsmouth.

On 25 April the first full scale trial was completed at Stokes Bay, near Gosport. No definite conclusions could be reached from the records of one bomb but the theoretical figures were confirmed and the Portsmouth tank experiments with the model were shown to be directly applicable to the full size bomb. Trials continued at Gosport and brought to light inevitable teething troubles and deficiencies in structure which necessitated several new designs. It was, therefore, May 1927 before a further full scale trial took place. This consisted of a drop from 3,000 feet off Portsmouth in which the bomb re-appeared on the surface after about 19 seconds immersion. In a second trial the bomb was dropped from 1,500, 3,000 and 6,000 feet all with successful re-appearance. During the remainder of 1927 and the first half of 1928, various dropping trials took place and small modifications to the design were made.

On 18 July 1928 the Air Council informed the Admiralty that they were studying the tactical use of the B-Bomb for which they had ordered a small number of the present design for experiment. Operational details were given including the information that the structural weakness of the temporary hydrostatic fuze (designed by Woolwich) imposed a height limit of 1,000 feet for release. They considered, however, that low altitude attacks on ships would in any case be preferable. Further delays now occurred over the production of a reliable fuze and in remedying this the Air Ministry Design Department was joined by the Torpedo Section at Gosport who favoured an electric firing device. Numerous trial drops with dummy bombs were made during 1929 and 1930 to test firing mechanisms and to modify the impact shock on entering the water by redesigning the bomb. It was not till the beginning of 1931 that the bomb was ready for trials against a moving ship. By this time considerable work had been completed at Gosport on dummy bombs for practice purposes fitted with audible firing devices which would indicate a hit under water.

The first sea trials against a moving ship took place on 24 February 1931 with H.M.S. Iron Duke as the target. Ten bombs were dropped and the conclusions were that it was possible to drop the bomb in such a position ahead of a ship that it would come up and strike the bottom, that there was no evidence of any "sweeping away" effect, and that the underwater path of the bomb was approximately vertical in both descent and ascent. Later in 1931, further trials were carried out against H.M.S. Centurion. Between the 7th and 12th September eighteen bombs were dropped from 300 feet and in a special report by the captain of the ship to the Admiralty it was stated that nine were possible hits. Unfortunately the fuze batteries failed during these trials owing to too long storage before use and the audible device could not confirm any actual hits.

The trials were considered successful enough to call for a conference at the Admiralty to discuss the future of the bomb. This was held in February 1932 and it was decided that before the bomb could be adopted as a regulation weapon there must be positive assurance on four specific questions:-

- (a) Will a bomb coming up underneath a ship hit it, or will it be deflected by the passage disturbance of the ship?
- (b) Will the bomb detonate when it hits?

(c) What will be the effect of the explosion, remembering that the buoyancy chamber comes between the ship and the charge?

(d) If the bomb is aimed ahead of the ship, what are the chances of avoiding action by the ship?

The results of the Centurion trials answered question (a) but question (b) had not been answered definitely owing to the failure of the fuze batteries. More trials were necessary but none took place until 1937, when the Bacchus was used as a target ship and question (b) was answered in the affirmative. Questions (c) and (d) remained unanswered.

In the interim, however, the design of the bomb had undergone a radical change. In the original, the size and shape had been decided largely with the torpedo as a model but there was nothing to indicate that this was best for this particular purpose. Indeed there were good reasons to the contrary. The shape was bad ballistically in the air, it could only be carried in aircraft designed for torpedo work, and the charge was a considerable distance from the ship when the nose was in contact. During 1931 and 1932 there was continuous research by the Royal Aircraft Establishment which produced a design closely resembling the standard bomb shape, with a nose and tail shaped to give good air ballistics and which broke off on entering the water so as to leave the bomb with maximum water drag to stop it descending too deep. Another question was that of the optimum size. Trials were conducted with 1/3rd size models of 1,100 lbs, 500 lbs and 250 lbs during 1932 and 1933. The resulting damage effect was assessed by the Admiralty experts as "serious" for both the 1,100 and 250 lb. designs and "promising" for the 500 lbs. The handier 250 lb bomb was therefore selected as the standard and given the name "B.2". It was unfortunate that the long period of difficulties experienced in designing an efficient and reliable electric fuze did not encourage more attention to the development of a mechanical fuze. As it was, this misguided perseverance held up the acceptance of the bomb as a standardised weapon until 1939 when at last the mechanical method was adopted.

On the outbreak of war, quantities of completed B-bombs were issued to Coastal and Bomber Command stations, but the B-bomb never became of operational use. Reference to its infrequent employment are in Volume II of the R.A.F. in Maritime War, pages 313, 316 and 324, and in Volume III, pages 198, and 410 to 412. (1)

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(1) A.H.B./II/117/3(B) and (C).

THE LENGTHY NEGOTIATIONS FOR THE TRANSFER OF THE FLEET AIR ARM

A.H.B.  
ID2/107  
encl.1

The preliminary stage was opened on 6 August 1937 when the C.A.S. suggested to the First Sea Lord that the initial step should be for the Admiralty to prepare a general statement of their proposals for the future organisation of the Fleet Air Arm. This was furnished on 27 September and as the new C.A.S. (Air Chief Marshal Sir Cyril Newall) pointed out in his reply, it was necessarily somewhat indeterminate as regards timing. It was followed on 8 October by an Admiralty scheme in which the transfer was divided into three phases covering the progressive advance of the following objectives:-

ibid  
encls. 2,  
3 and 4

1. The creation of an organisation within the Admiralty to supervise the administrative details.
2. The replacement of R.A.F. pilot personnel hitherto employed in the Fleet Air Arm and certain aspects of training.
3. The creation of a class of naval ratings qualified to undertake the maintenance, overhaul and repair of aircraft.
4. The transfer of shore establishments.

ibid  
encl.5

No. 1 was relatively simple. The administrative arrangements for the new Fleet Air Arm were made the responsibility of an Assistant Chief of the Naval Staff (Air), short title A.C.N.S.(A). The first holder of this post was Rear-Admiral J. H. D. Cunningham who had previously on 10 August been appointed as head of the Admiralty Naval Air Division.(1) All the first detailed discussions on the subject of transfer were conducted between him and the Air Member for Supply and Organisation (A.M.S.O.) who was Air Vice-Marshal W. L. Welsh, with occasional joint reference to Sir Thomas Inskip (Minister for Co-ordination of Defence). Later, in January 1938, the Admiralty appointed Directors of Air Material and of Air Personnel.

ibid  
encls. 7,  
8 and 9

Nos. 2 and 3 involved the solution of the Personnel problem which was fundamental to the whole scheme. The first clash occurred over the question as to which Department should be responsible for the intermediate flying training (2) of naval personnel intending to serve in the Fleet Air Arm. As no agreement could be arrived at, the matter was referred to Sir Thomas Inskip. He held a meeting on 24 and 25 November at which both sides put their case in full detail. The Minister's ruling was given in a memorandum dated 7 December 1937 in which he gave his considered reasons for deciding that the intermediate training should be given in schools administered by the Air Ministry and under Air Force command.

ibid  
encl.14

The second clash was of far longer duration. It was concerned with the conditions under which R.A.F. maintenance

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- (1) A year later the title of A.C.N.S.(A) was changed to Fifth Sea Lord and Chief of the Naval Air Service.
  - (2) This was the period which pilots spent in Service Flying Training Schools after leaving the ab initio elementary civil flying schools and before proceeding to the specialised training establishments.

A.H.B.  
ID/3/4

personnel could be asked to volunteer for transfer or could be loaned to the Fleet Air Arm for an indefinite period while the Admiralty were endeavouring to build up their own maintenance personnel. After the exchange of a number of letters on the subject between the heads of the Service Departments, a conference was held on 18 February 1938 with Sir Thomas Inskip in the Chair.

ibid

Rear Admiral Cunningham said that, in framing their proposals for transfer, the Admiralty had assumed that this would take place on an agreed date, say 1 May or 1 August next, but for some considerable period afterwards the personnel could not be wholly provided from naval sources - particularly in maintenance personnel would there be a deficiency. They had envisaged that to make this good there would be a number of volunteers from the R.A.F. for permanent transfer to the Navy and failing sufficient of these that there would be a loan of the necessary number from the R.A.F.

ibid

Air Vice-Marshal Welsh replied that they had no wish to prolong the implementation of the Government's decision but once the Fleet Air Arm ceased to be a part of the Air Force it was outside their powers to provide Air Force personnel for that formation except in so far as personnel volunteered for duty with it. They could use no compulsion. For this there would have to be fresh legislation from Parliament. He personally thought it ought to be the other way round and that naval entrants should be compelled to serve in Air Force manned units until sufficient were trained so that the unit could then be handed over to the Navy. After all it was the Navy who had obtained complete control of the F.A.A. and it was their duty to man it. It was for them rather than the Air Force to seek compulsory powers if necessary. Continuing, he said they were greatly concerned at the many difficulties involved in this transfer. He had frequently stressed the importance of the personnel aspect which was fundamental to the whole project. Seven months had elapsed since the Cabinet decision but as yet they had received no lists of naval personnel for training nor had any steps been taken to call for volunteers. Until the personnel question was settled, all concerned were really groping in the dark in regard to the transfer. Regarding the deficiency of naval pilots he observed that since July there had actually been a falling off in the numbers of naval trainees at Leuchars and the Air Ministry were anxious that future arrangements should be made to avoid a sudden peak in training demands.

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Negotiations dragged on with little result for another two months. Then in April, Rear-Admiral Cunningham made proposals for the permanent transfer to the Fleet Air Arm of 21 R.A.F. officers of Squadron Leader and Wing Commander rank for flying duties and seven engineering specialists of Flight Lieutenant or Squadron Leader rank. The Air Council replied that they had every wish to help in getting the Fleet Air Arm established as a self-contained entity but, in view of their own further accelerated expansion, they could not see their way to making such a transfer. They suggested that as 294 naval officers had been trained for pilots between 1926 and 1937 of whom not more than 120 were at present serving in naval air units, it seemed more desirable from every point of view that the requirements indicated in these proposals should be met from Naval and not R.A.F. sources.

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A scheme for providing sufficient maintenance personnel for the Fleet Air Arm units during the transitional period was put forward by Sir Thomas Inskip on 26 April. The two Departments considered this and the political heads exchanged letters of opinion on it on 17 June, 4 and 28 July 1938. Further details were discussed concerning the drafting, discipline and administration of the R.A.F. personnel it was proposed that the Air Ministry should loan to the Fleet Air Arm together with the date to be fixed for the commencement and a provisional time limit for the scheme. These again dragged on for further months.

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Meanwhile a difference of opinion had arisen over the No. 4 objective - the transfer of shore establishments. The Air Ministry said they were willing to transfer the air stations at Donibristle, Ford, Worthy Down and Lee-on-Solent, and that the Fleet Air Arm could use spare accommodation at Eastchurch, Andover and Mount Batten. In addition they offered Lympne Airport (subject to agreement with the Director of Civil Aviation) and Southampton Airport (subject to agreement with the Port Authority). However, the Admiralty did not consider Lympne or Southampton as suitable and held that the R.A.F. should hand over Thorney Island and share Gosport with them under naval control. The Air Ministry refused to entertain this and both sides appealed for a ruling to the Minister for Co-ordinating Defence. He gave his decision in a report dated 1 June 1938 in which he recapitulated in full the rival arguments and gave as his decision that both Thorney Island and Gosport should continue to be controlled by the Air Ministry.

ID/3/4

The long drawn-out arguments over the personnel questions finally came to a head in a meeting held at the Air Ministry on 22 December 1938 between the political and service heads of the two Departments to get some finality in the provision of R.A.F. personnel for service in the Fleet Air Arm and to settle the conditions of transfer. It was agreed:-

1. That no transfer of any unit should take place until the naval personnel in it exceeded 50 per cent of the strength.
2. That the Admiralty should inform the Air Ministry as soon as possible if they would be in a position to take over as a whole on 1 April 1939 or whether it would have to be once more deferred.
3. That the Fleet Air Arm must be diluted in regard to supervisory and maintenance personnel to the same extent as had been necessary in the Central R.A.F.
4. That the provision of extra training facilities, of air units for carriers in reserve or refitting, and for the formation of new squadrons should be further discussed in the hope of reaching an acceptable compromise.
5. That the Air Ministry's proposal in answer to the Admiralty's suggestion of training reserve pilots on the lines of the R.A.F. Volunteer Reserve Scheme should be left for further discussion between the two staffs.

- 6. That as long as R.A.F. personnel were loaned to the Admiralty there would be an R.A.F. officer in each carrier and station for their administration and welfare.

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The Fifth Sea Lord then renewed the Admiralty claim to Gosport and Thorney Island stations but it was pointed out that this matter had been settled in June by Sir Thomas Inskip's ruling and the question could not be re-opened.

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Though this Conference cleared the air on some points, there was still no agreed method of finding the ultimate deficiency in personnel. In January 1939 the First Lord circulated a memorandum among his colleagues in the Cabinet giving the existing state of the Fleet Air Arm and the measures considered necessary for its development up to 31 March 1942. It was stated that the defence requirements contained in C.I.D.1215-B of March 1936 had envisaged an expansion of the Fleet Air Arm to a first line strength of 504 aircraft by 31 March 1942 but it did not enter into ways and means of reaching and maintaining that strength. The recent order to transfer the Fleet Air Arm from the Air Ministry to the Admiralty had raised problems requiring much discussion between the two Departments before a detailed programme could be presented in the Estimates. A rough summary of the position was given as under:-

		Actual Nos. in March 1939	Required by March 1939	Required by March 1942
Aircraft	First line strength	235	312	504
	Reserves and training	650	1,088	1,450
Personnel	Exclusive of men under training	2,600	4,530	8,700

There were thus serious deficiencies even at the present time. The transfer decision left the Navy with the problem of providing large numbers of personnel for whom the R.A.F. were formerly exclusively responsible e.g. the whole of the maintenance personnel and a proportion of the flying personnel. Until the naval recruiting and training could catch up with the deficiency, the Fleet Air Arm would have to rely on the R.A.F. to make this good as far as possible.

ID2/107

On 13 February 1939 the First Lord wrote to the Secretary of State for Air giving figures of how many R.A.F. personnel they would require to be retained on loan in the Fleet Air Arm until April 1941.(1) This vexed question of the naval deficiency provoked the Secretary of State on 10 March to accuse the Admiralty of expecting 100 per cent self sufficiency regardless of the unprecedented expansion taking place in the

(1) The Admiralty estimated that on 1 January 1939 the numbers of R.A.F. maintenance personnel employed in the Fleet Air Arm were 280 supervisory and 1,060 non-supervisory airmen of all grades. They therefore required this total of 1,340 to be retained and loaned to the Royal Navy until 1 April 1941 and thereafter be gradually reduced.

R.A.F. where wholesale deficiencies were commonplace. They simply could not make their own troubles worse in order to bring the Fleet Air Arm to full strength, furthermore it was plain that the extensive dilution already practiced in the R.A.F. was not being matched by the Admiralty. The letter went on to analyse the supervisory grade figures showing that 160 was the maximum which might be claimed and invited the Admiralty to amend their figure for the non-supervisory airmen required. It concluded that the provisional ultimate withdrawal date for the last of these ratings should be not later than March 1942 and observed that, as the Fleet Air Arm was to become naval, the R.A.F. could not go on indefinitely providing personnel for another Service. Replying to this letter on 15 March the First Lord suggested that the two Departments were not considering the actual numbers from the same point of view and the consequent delay in getting the maintenance personnel question settled made it impossible for the Admiralty to take over control on 1 April as hoped.

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After further discussion about these numbers the two ministers came to the conclusion that, pending complete agreement, some sort of transfer should take place immediately and on 1 May 1939 the Air Ministry proposed that the Admiralty should on 15 May officially take over the administration of the Fleet Air Arm and transfer of the R.A.F. Stations at Lee-on-Solent, Ford, Southampton, Worthy Down, Donibristle and Bermuda.

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On 6 May the Admiralty replied in a long letter stating that for certain of the services involved, arrangements had progressed sufficiently for the Board to undertake responsibility but until Naval resources had been increased they were unable in certain other important services to assume complete responsibility and were dependent on sources under the control of the Air Council. A number of questions affecting these latter were still in various stages of progress between the two Departments. However, subject to and without prejudice to the Board's position on these items they suggested that the effective date of transfer of administration and R.A.F. stations should be 24 May. There followed a number of opinions on matters with which they hoped the Air Council would agree and the information that they proposed to appoint, from the date of transfer, a Flag Officer to be designated Rear Admiral Naval Air Stations who would be responsible for the administration of Fleet Air Arm shore stations in the United Kingdom. Regarding the repair and maintenance of aircraft the Board did not contemplate the assumption of full responsibility until the new Naval Repair Establishment had been built which was not expected until about April 1941. In an appendix to the letter were listed the major questions still outstanding and these included the numbers of pilots, reserve pilots and maintenance ratings required to be loaned to the Fleet Air Arm on mobilisation besides requirements for additional accommodation at R.A.F. shore bases until the R.N. Stations were available and provision of Fleet Air Arm requirements at Overseas bases. Attached to the letter was a draft Fleet Order embodying a broad picture, for the information of all Naval authorities concerned, of the system under which the Fleet Air Arm would be administered in the future. The letter concluded with the hope that the Air Council were in agreement with the foregoing summary of the position and the terms of the draft Fleet Order.

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After careful scrutiny in Air Ministry departments an answer was given to the Admiralty on 16 May. In this the proposed date of transfer was agreed as 24 May 1939 with an also agreed postponement in the case of Eastleigh and Lympne stations until 1 July. With regard to the Fleet Order, certain amendments were suggested of which the most important concerned the R.A.F. officers and airmen to be loaned. These would be drafted, not to the Fleet Air Arm units in which they were to serve, but to the R.A.F. components of these units, so remaining under the care of the Air Ministry.(1)

During the summer of 1939 the deficiencies in the maintenance personnel of the Fleet Air Arm were gradually made good. It was found possible by the Air Ministry to loan 1,350 trained maintenance personnel and the call for volunteers for permanent transfer to the Navy produced 800 more of all grades while 200 R.A.F. artificer class apprentices volunteered to become naval ratings before completing their training. The great majority of all these men were required to remain well into the 1939 War and in November 1940 there were still 2,000 odd R.A.F. personnel serving in the Fleet Air Arm.

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(1) This was regularised in a subsequent amplification of the Fleet Order (A.F.O.1358/39) by which any units containing R.A.F. personnel should carry a Royal Air Force numbering and such numbers would be allotted out of the R.A.F. series. Ref: A.M. File S.918135/39, / encls. 21A, 27A and 31A.

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Date	Target	No. of Battle-ships	No. of air-craft	TORPEDOES					Remarks
				Fired	Hits	Miss	Did not run	% Hits	
16 July 1921	Single ship - <u>Malaya</u> - under way	1	6	6	3	3	0	50%	
20 July 1921	Single ship - <u>Queen Elizabeth</u> - under way	1	6	6	1	5	0	16 $\frac{2}{3}$ %	
23 July 1921	Two ships <u>Barham</u> and <u>Malaya</u> - under way	2	5	5	2	3	0	40%	
2 Sep. 1921	Battle squadron screened by Drs. using smoke screen	5	8	8	6	1	1	75%	
5 Dec. 1921	Single ship - <u>Malaya</u> - under way	1	7	6	4	1	1	66 $\frac{2}{3}$ %	1 a/c returned - engine failure
10 Apl. 1922	Battle squadron - Atlantic Fleet - under way	5	12	12	8	3	1	66 $\frac{2}{3}$ %	
7 July 1922	Two Battle squadrons - Atlantic Fleet - under way	9	12	12	6	5	1	50%	A/c had orders to attack from ahead - C.in C.
21 Aug. 1922	Battle squadron - under way (Dummy attack)	3	10	-	-	-	-	-	No torpedoes by orders C.in C. owing to heavy sea
24 Nov. 1922	Attack on Fleet at anchor at Portland	6	4	1	1	0	0	100%	Dusk attack - 3 a/c returned early owing to fog
1 Dec. 1922	Battle squadron - Atlantic Fleet - under way	5	11	7	2	3	2	28.6%	1 a/c force landed - engine failure. 2 a/c returned - engine trouble
6 Jan. 1923	Single ship - <u>Queen Elizabeth</u> - under way	1	7	6	3	3	0	50%	1 a/c returned - engine trouble
3 Apr. 1923	Two Battle squadrons - V formation and close destroyer screen	7	12	12	8	4	0	66 $\frac{2}{3}$ %	
8 May 1923	<u>Queen Elizabeth</u> screened by destroyers Object - To attack, return to base, re-arm, refuel and make a second attack	1	5	5	3	1	1	60%	On 1st attack 1 a/c returned owing to engine trouble.
			6	6	1	3	2	16 $\frac{2}{3}$ %	Time taken between attacks was 26 $\frac{1}{2}$ minutes
11 June 1923	1st Battle Squadron - object - to investigate the efficiency of attack when torpedoes are fired outside the normal position of a close screen	5	12	12	4	8	0	33 $\frac{1}{3}$ %	Minimum range - 1,000 yards Maximum range - 1,600 yards
18 June 1923	Dusk attack on Atlantic Fleet at anchor in Weymouth Bay	8	6	6	3	3	0	50%	Actual attack was carried out in dark at 2214 hours.
25 June 1923	Seven battleships - Two battlecruisers screened by 8 Drs. - object - long range attack at sea	17	10	10	3	6	1	30%	Minimum firing range - 500 yards Maximum firing range - 1400 yards
27 July 1923	Four battleships - under way	4	10	10	6	2	2	60%	Average range - 1000 yards New tactics adopted by ships
17 Sep. 1923	Single ship - <u>Queen Elizabeth</u> - under way	1	6	6	1	3	2	16 $\frac{2}{3}$ %	
15 Oct. 1923	Submarine Depot Ship and two M/S - under way	3 ships	6	6	3	3	-	50%	Torpedoes set to run deep. Owing to muddy water only 3 seen
14 May 1924	Battle squadron - Atlantic Fleet - under way	3	8	8	4	4	-	50%	
20 May 1924	Single ship - <u>Malaya</u> - under way	1	4	4	1	3	-	25%	inexperienced pilots
26 June 1924	Battle squadron - Atlantic Fleet - under way	3	8	8	4	4	-	50%	
28 July 1924 to 18 Aug. 1925	Battleships and cruisers of the * Mediterranean Fleet both singly and in squadrons - under way	?	?	98	59	39	-	60%	Attacks by No. 460 Torpedo Flight from H.M.S. <u>Eagle</u>
11 May 1925	Single ship - <u>Revenge</u> - under way	1	12	12	5	7	-	41 $\frac{2}{3}$ %	
14 Sep. 1925	Single ship - <u>Hood</u> - under way	1	12	11	3	8	-	27.3	Initial attacks by Nos. 461 and 462 Flights - Gosport
6 Nov. 1925	<u>Revenge</u> and <u>Royal Oak</u> - under way	2	12	10	8	2	-	80%	By Nos. 461 and 462 Flights from Gosport
22 Jan. 1926	Battle Squadron - Atlantic Fleet - under way	4	12	11	4	7	-	36.3	By Nos. 461 and 462 Flights First attacks from <u>Furious</u> .
Totals				304	156	134	14	51.3	

\* Details in A.H.B. IIA/1/4 encl. 12.

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APPENDIX XI

OPERATIONAL TRAINING EXERCISES - 1929 to 1939

Date	Nature of Exercise	Squadrons Taking part
<u>1929</u>		
<u>January</u> 14th and 15th	A/S exercise MA - with the Portland A/S School	No. 201
<u>March</u> 19th and 20th 21st	Exercise AP - search for and shadow a convoy Interchange of pilots and naval officers from A/S School	No. 201 No. 201
26th	A/S exercise and demonstration by submarines	No. 201
<u>May</u>	Torpedo attacks on naval units on 8th, 13th, 14th and 15th	Mo. 36
<u>June</u>	Torpedo attacks on naval units on 1st, 11th and 13th	No. 36
<u>October</u> 25th	A/S exercises - with Portland A/S School Torpedo attack on the Battle Fleet	No. 201 No. 36
<u>November</u> 6th and 7th	Submarine exercise AR	No. 201
N.B. Only Nos. 36 and 201 Squadrons were operationally fit. No. 203 Squadron went overseas to Basrah in March and No. 204 Squadron was still working up.		
<u>1930</u>		
<u>March</u> 30th to Apr. 2nd	Fleet exercise AS - Search, locate and report for the benefit of submarines	No. 201
<u>April</u> 14th	A/S exercise - Portland - and demonstration by submarines	Nos. 201 and 204
<u>June</u> 1st to 3rd	Exercise AT - convoy location in St. George's Channel	No. 201
8th to 12th	Local exercises with the Fleet in Western Channel	Nos. 204 and 209
25th to 31st	Exercises with naval units to Irish waters	No. 204
<u>September</u> 24th	Exercise with naval units in the Channel	No. 209
<u>October</u> 13th to 17th 27th to 29th	A/S exercises - with the Portland School Exercise AU - A/S screen to <u>Iron Duke</u>	No. 204 No. 201
N.B. No. 36 Squadron continued torpedo training up to July and then went overseas to Singapore. The relief No. 100 Squadron was not formed till November.		

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APPENDIX XI (Contd.)

Date	Nature of Exercise	Squadrons taking part
<u>1931</u>		
<u>February</u> 25th to 28th	Exercises with 5th Submarine Flotilla off I.O.W.	No. 201
<u>March</u> 17th to 20th	A/S Exercises off Portland - Naval officers taken up to view submarines from the air	No. 201
31st	Fleet exercise AV in Western Channel	Nos. 201 and 204
<u>May</u> 19th	Torpedo attacks on Fleet at anchor in Cromarty Firth	No. 100
<u>June</u> 15th to 18th	Torpedo training exercises with <u>Courageous</u> off I.O.W. Fleet exercise AW in Western Channel	No. 100 No. 204
<u>October</u> 13th to 16th	A/S exercises with the Portland School	No. 201
<u>November</u> 17th to 19th	Fleet exercise AX in Western Channel	Nos. 201 and 204
26th	Shadowing and course estimation exercises with <u>Repulse</u>	No. 201

N.B. No. 209 Squadron was having continuous trouble with their Iris flying boats. No. 210 Squadron was formed in March but had no aircraft till the autumn and took no part in exercises.

<u>1932</u>		
<u>January</u> 28th to Feb. 3rd	Trying to locate the lost submarine M.2	No. 201
<u>March</u> 16th	Pilots taken to sea in submarines and destroyers to witness submarine hunts with ASDIC	No. 201
17th	Convoy escort exercise with Portland School	No. 201
<u>April</u> 25th	Fleet exercise AZ in Western Channel	No. 204
<u>May</u> 6th 20th	Exercise with <u>Rodney</u> against submarines Naval officers taken up to witness submarine demonstration	No. 201 No. 201
<u>June</u> 10th to 13th	Fleet exercise AA	No. 204
<u>July</u> 6th to 8th 13th and 14th	Fleet exercise AB Exercises with A/S School at Portland	No. 204 No. 204
<u>October</u> 17th to 19th	Several squadron torpedo attacks on the Battle Fleet Exercise P.H.D. with A/S School at Portland	No. 100 No. 201
<u>November</u> 14th to 17th	Fleet exercise AC	No. 204

N.B. Nos. 209 and 210 Squadrons were still not operationally fit.

In the Mediterranean, No. 202 Squadron took part from 1 September in several search, shadowing, spotting and anti-submarine exercises with the Fleet.

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Date	Nature of Exercise	Squadrons taking part
<u>1933</u>		
<u>March</u> 8th	Fleet exercise AE in Channel area	No. 210
15th	Exercise with the <u>Malaya</u>	No. 204
28th	Fleet exercise AF - Inner and Outer A/S screens	No. 204
28/29th	Night exercise TX.20 with <u>Renown</u> and <u>York</u>	No. 201
<u>May</u> 9th	Night recee. and shadowing with <u>Nelson</u> and <u>Rodney</u>	No. 201
11th, 19th and 25th	Torpedo attacks on Fleet in Moray Firth	No. 100
<u>June</u>		
15th and 30th	Torpedo attacks on naval units off I.O.W.	No. 100
19th and 20th	Search patrol exercises with the Fleet	No. 204
During June and up to 14 July	Exercises with F.O. Submarines in W. Scottish waters	No. 201
<u>September</u>	While on E. Scottish waters cruise - Exercise DE.	No. 201
<u>October</u>		
20th and 21st	Exercise DT with Portland A/S School	No. 201
<u>November</u>		
13th and 13/14th	Fleet exercise AR - In Western Channel - Inner and Outer A/S screens, and night shadowing exercise with <u>Malaya</u>	Nos. 201 and 209
N.B. Nos. 209 and 210 Squadrons not yet fully operational		
In the Mediterranean, No. 202 quadron took part in A/S exercises with destroyers and submarines during January, February and April.		
<u>1934</u>		
<u>January</u> 12th and 12th/13th	Fleet exercise AS - Inner and Outer screening patrols and night shadowing exercise with <u>Hood</u> .	No. 201
<u>February</u> 8th	Night shadowing exercise with <u>Vanquisher</u>	No. 201
<u>March</u> 17th	Fleet exercise AT - Location and shadowing using air reports to aid submarine attack on the Fleet	Nos. 201, 204, 209 and 210
<u>May</u>		
9th	Night search and shadowing of naval units	No. 201
13th to 16th	Fleet exercise EB - Night shadowing	Nos. 201 and 204
27th to 30th	Continuous day and night A/S exercise with Captain D.6 and the ASDIC branch	No. 204
<u>September</u>		
20th and 20/21st	Torpedo attacks on 18th, 20th, 21st, 24th and 28th on naval units	No. 22
20th and 20/21st	Coast Defence exercise in the Channel and night search exercise with the <u>Curacoa</u>	No. 201

Date	Nature of Exercise	Squadrons taking part
1934 (Contd.) <u>October</u>	Torpedo attacks on 2nd, 5th, 11th, 15th, 17th, 30th and 31st against Home Fleet units	No. 22
<u>November</u> 1st to 3rd	Fleet exercise EF - Search, location and shadowing	Nos. 201, 204 and 209
N.B. No. 100 Squadron went overseas to Singapore in January 1934 and No. 22 Squadron was not transferred to Coastal Area until May. Nos. 209 and 210 Squadrons were still only partially operational. No. 230 Squadron formed on 1 December.		
There were no air exercises with the Navy in the Mediterranean.		
<u>1935</u> <u>January</u> 15th	A Coast Defence exercise	No. 201
<u>February</u> 26th	Exercise with the <u>Woolston</u> - Night flying	No. 201
<u>March</u> 5th to 8th	A Trade Protection exercise with the Portland A/S School	No. 204
24th to 25th	A Fleet Exercise	No. 201
<u>May</u> 21st to 24th	Fleet exercise FB with Home Fleet off the East Coast. Location, shadow and bombing attack	Nos. 22, 201 and 204
29th	Torpedo attacks on <u>Curacoa</u>	No. 22
<u>June</u>	Torpedo attacks on <u>Curacoa</u> on 4th, 12th and 25th	No. 22
5th to 20th	Exercises with 5th Submarine Flotilla off Oban	No. 204
<u>October</u> 9th	Patrol and search exercises from Gibraltar	No. 210
N.B. From January to June No. 210 Squadron was flying Singapore boats out to No. 205 Squadron in the Far East. They then re-equipped at home with Rangoon boats and in September were detached to Gibraltar. No. 204 Squadron was sent in the same month to Alexandria together with the newly formed No. 230 Squadron. No. 22 Squadron was sent out to Malta in October. No. 209 Squadron was still having troubles with their aircraft.		
In the Mediterranean, No. 202 Squadron took part in search patrol and shadowing exercises with the Fleet in January and again in July. From early October to the end of the year they carried out various A/S patrol schemes with the Coastal Area detachments in connection with precautions during the Italo/Abyssinian War.		

Date	Nature of Exercise	Squadrons taking part
<u>1936</u>		
<u>February</u> 20th and 21st	Exercises with the Navy from Gibraltar	No. 210
<u>March</u> 16th	Shadowing exercises with <u>Royal Sovereign</u>	No. 201
<u>May</u> 25th to 28th	A/S escort and shadowing exercises with 1st Battle Squadron and position reporting in aid of submarine attack.	Nos.201 and 209
<u>June</u> 9th and 10th	Exercises in Irish Sea with ships and Submarines	No. 201
<u>July</u> 20th and 21st	Exercises with the A/S School at Portland	No. 209
<u>October</u> 29th to 31st	Fleet exercise in North Sea with Home Fleet - Search, location and shadowing day and night	Nos. 201, 204, 209 and 48
<u>November</u> 19th	A/S exercises with H.M. S/M.s <u>Otway</u> and <u>Oberon</u>	No. 201
<u>December</u> 1st	Night patrol exercise with <u>Rodney</u>	No. 204
3rd and 4th	Exercises with <u>Resolution</u> in the Eastern Channel	Nos.204 and 209
7th	Night shadowing exercise with <u>Rodney</u>	No. 201
N.B. No. 210 Squadron remained at Gibraltar and Nos. 204 and 230 Squadrons in the Mediterranean until August. In October No. 230 Squadron was sent overseas to Singapore and No. 22 Squadron returned home.		
In the Mediterranean there were exercises every month up to August in which No. 202 Squadron and the Coastal Area detachment took part. They included Fleet exercises in search and shadowing, A/S exercises, and patrol reporting in aid of submarines.		
<u>1937</u>		
<u>January</u> 18th to 21st	Trade Protection exercise in the S.W. Approaches - Searches, A/S inner and outer screens, torpedo and bombing attack.	Nos.22, 48, 204, 209 and 210
<u>February</u> 1st to 5th	Exercises with the Portland A/S School	No. 204
15th	Night flying exercise with the <u>Wallace</u>	No. 204
21st and 22nd	Long range search patrols with Home Fleet en route through S.W. Approaches to Gibraltar	Nos.201 and 204
<u>March</u> 2nd to 12th	Exercises PX.2 and PX.3 with 2nd Submarine Flotilla in West Scottish waters	Nos.210 and 228
21st to 23rd	Long range search, shadow and final attack on Home Fleet returning from Gibraltar	Nos.22, 42, 201, 210 and 228

Date	Nature of Exercise	Squadrons taking part
<u>1937(Contd.)</u>		
<u>May</u>	Bombing trials during the month against <u>Bacchus</u>	No. 22
6th	Bomb attack exercise on 2nd Battle Squadron	No. 217
13th	Night location and shadowing of the Battle Squadron	No. 201
24th	Ship recognition practices with Home Fleet	No. 217
24th to 31st	A/S exercises with Portland A/S School	No. 201
<u>June</u>	During the month there were numerous torpedo attacks against various Fleet units	Nos. 22 and 42
7th	Fleet exercise in recce., shadowing, inner and outer screens	No. 204
8th and 9th	Exercises with 2nd Submarine Flotilla in Bristol Channel	Nos. 210 and 228
10th to 17th	A/S exercises off Oban	No. 204
17th and 18th	Location and bombing exercises in N. Sea with <u>Durban</u>	No. 206
24th	Exercise AD - Convoy shadowing in aid of submarines	No. 228
29th to 4th <u>July</u>	Exercise TDXR - Location and shadowing of a merchant raider	No. 228
<u>July</u> 13th to 16th	Combined Coast Defence Exercise CDX - search, shadow, inner and outer screens, bomb and torpedo attacks	Nos. 22, 42, 201, 204, 209 and 210
<u>August</u> 7th and 17th	Exercises with Fleet units in location and bomb attack	No. 217
<u>September</u> 2nd and 4th and 10th to 12th	Exercises with Home Fleet en route from the Channel to Invergordon. Locate, shadow and bombing attacks including exercise HPIX	Nos. 48, 206, 209, 210 and 217
<u>October</u> 27th and 28th	Exercises with the Home Fleet in Eastern Channel area. Day and night search, night shadowing (XHG), torpedo and bomb attacks.	Nos. 22, 42, 201, 217 and 228
<u>December</u> 11th	Search patrol exercise with <u>Dunedin</u>	No. 217

N.B. Nos. 204, 209 and 210 Squadrons were sent to the Mediterranean in September for special patrols.

In the Mediterranean, No. 202 Squadron took part in several fleet exercises between February and July which included search, report and shadowing, A/S escorts and patrols, and bombing attack exercises. From September to the end of the year, No. 202 Squadron together with the Coastal Command squadrons carried out Anti-Piracy patrols under the Nyon Agreement. In addition during this period, several A/S exercises were done with destroyers and submarines.

Date	Nature of Exercise	Squadrons taking part
<u>1938</u>		
<u>January</u>		
6th and 10th 10th	Torpedo attacks on <u>Sabre</u> off Inch Keith A/S exercise with the Portland School	No. 42 No. 217
17th to 19th	Fleet exercises - Search, day and night shadowing, bombing and torpedo attacks.	Nos. 22, 48, 217, 228 and 269
27th	Bombing and torpedo practice against naval units	Nos. 22 and 42
<u>February</u>		
7th to 14th 21st to 24th	Torpedo attacks on <u>Sabre</u> off Firth of Forth	No. 42
<u>March</u>		
1st to 4th	A/S exercises with Portland School	No. 228
26th to 31st	Fleet exercise XJC - Long range searches, report, shadow with torpedo and bombing attacks	Nos. 42, 201, 206, 209, 210, 217 and 228
<u>May</u>		
6th	Experimental parallel sweep and track searches	No. 210
11th to 18th	Trade Protection exercises A, B and C - Location and attack	No. 217
16th and 19th	"B" bomb trials from Calshot against <u>Bacchus</u>	No. 210
23rd to 26th	A/S exercises with Portland School	No. 210
<u>June</u>		
2nd to 6th	Further "B" bomb trials and bombing on <u>Centurion</u>	Nos. 210 and 206
3rd, 4th and 15th	Submarine exercises BA, BB and BC	No. 228
23rd	Torpedo attacks on <u>Dunedin</u>	No. 42
30th	Bombing on <u>Centurion</u>	No. 217
<u>July</u>		
1st to 15th	Bombing on <u>Centurion</u>	Nos. 42 and 209
16th to 23rd	Combined exercise CDX off east coast of Scotland. Day and Night searches, shadowing, bomb and torpedo attacks (First employment of Sunderlands)	Nos. 42, 201, 204, 206, 210, 228 and 269
<u>September</u>		
6th	Three Sunderlands in Bristol Channel exercise with <u>Cornwall</u>	No. 210
20th	Inner and Outer A/S screen practice with Portland	No. 201
<u>October</u>		
19th	Bombing trials against <u>Bacchus</u>	No. 42
20th and 27th	Trade Protection exercises D and E in Channel area	No. 217

Date	Nature of Exercise	Squadrons taking part
<u>November</u> 12th to 16th  24th  17th and 29th  <u>December</u> 7th and 14th	Fleet exercise XJM in North Sea - Day and night search, shadow, and torpedo attacks.  Bombing trials against <u>Bacchus</u> .  Submarine exercises SFX and TTX off Portland  Search for foreign submarines on passage in Channel	Nos. 22, 209, 210, 233 and 269  No. 42  No. 217  No. 217
In the Mediterranean, No. 202 Squadron took part in Fleet and A/S exercises with naval units in January, May, June and July. The squadron was mobilised on 26 September in the Munich Crisis and was moved to Alexandria from which exercises were done until the end of the year with H.M. ships in the area.		
<u>1939</u>  <u>January</u> 16th to 20th  <u>February</u>  11th  16th and 17th  17th  27th  <u>March</u>  16th  16th and 17th  17th to 24th  20th  <u>April</u>  28th  <u>May</u>  15th and 16th  16th  26th to 31st	Fleet exercise KKA in S.W. Approaches - Day and night searches, A/S inner and outer screens.  On 1st, 6th and 21st, torpedo attacks on <u>Resolution</u> and <u>Dunedin</u>  Search, location and photographs of German vessels.  Night searches off Portland and A/S exercise SF  Local Defence exercise off Leuchars  A/S exercise with Portland School  On 9th, 14th, 15th and 16th, torpedo attacks on <u>Dunedin</u>  Long range search exercise for Home Fleet from Falmouth  A/S exercise SAX - Inner and Outer screens  Fleet exercise XKC in S.W. Approaches - Day and night searches etc.  Search, location and photographs of German vessels  Night flying and bombing exercises during the month  Trade protection exercise TPE - Search for a convoy and torpedo/bombing attacks.  During the month four days of torpedo attacks on naval units  Submarine exercise SMAX  Search, location and photographs of German submarines  A/S exercise TSX.2 - Screening and escort patrols	Nos. 48, 201, 204, 210 and 228  Nos. 22 and 42  No. 48  No. 217  No. 269  No. 201  No. 42  No. 201  No. 217  Nos. 204, 209, 217 and 228  No. 48  No. 22  Nos. 42 and 217  Nos. 22 and 42  No. 217  No. 217  No. 217

Date	Nature of Exercise	Squadrons taking part
1939 (Contd.)		
<u>June</u>		
1st to 4th	Co-operation in searches for and salvage of lost S/M <u>Thetis</u>	Nos.201, 209 and 269
5th	Search exercises and attacks on naval units in Channel	Nos.217 and 22
6th	Location, shadowing, and attacks on Home Fleet in N. Sea.	Nos.206 and 269
12th and 15th	A/S exercises TCX.1 and TCX.8	No. 217
13th to 15th	Location and shadowing exercises with Home Fleet	No. 204
<u>July</u>		
23rd to 27th	Dummy torpedo attacks on <u>Dunedin</u>	No. 42
28th to Aug. 3rd	Successful locations of several German merchantmen	No. 217
<u>August</u>		
1st to 3rd	Torpedo attacks on <u>Dunedin</u>	No. 42
8th to 12th	Defence exercises - Searches, strike and A/S patrols	Nos.48 and 206
13th	A convoy exercise in the Western Channel	No. 217
15th to 18th	Exercise ARX with local naval units from Plymouth	No. 204
15th to 21st	The last Fleet exercise XKD - In the North Sea Subsidiary minelaying exercise XKE - off N. Foreland.	Nos.42,48,201, 206,209,210, 220,224,233, 240 and 269

N.B. In June, No. 228 Squadron was detached to Malta

In the Mediterranean, No. 202 Squadron took part in Fleet exercises in January and February. In March, bombing practice was done on the Centurion. Early in August Nos. 202 and 228 Squadrons were moved to Alexandria and between the 9th and 15th took part in Fleet exercises XUA and XUC - Search and shadow day and night,

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APPENDIX XII

AIR FORCE PLANS IN THE WESTERN SERIES AGAINST GERMANY

As at 13 June 1939 - Ref: C.O.S. 915 (J.P.)

Plan	Subject	Remarks
W.A. 1	Attack on the German Air Striking Force and its maintenance organisation, including the aircraft industry.	Plan complete.
W.A. 2	Reconnaissance in co-operation with the Navy in Home Waters and the Eastern Atlantic.	Plan complete.
W.A. 3	Close co-operation with the Navy in convoy protection in Home Waters and the Eastern Atlantic.	Plan complete.
W.A. 4	Attack on German military rail, canal and road communications. W.A.4(a) - In Western Germany. W.A.4(b) - To delay invasion of Southern Holland, Belgium and France.	Being discussed between British and French General and Air Staffs.
W.A. 5	Attack on German manufacturing resources. W.A.5(a) - Attack of German war industry. W.A.5(b) - Attack on the Ruhr and its effect on the military lines of communication in Western Germany. W.A.5(c) - Attack of Germany's war resources of oil.	Plan complete. Plan complete. Plan in draft form.
W.A. 6	Attack on Italian manufacturing resources (not prepared yet).	W.A.6 was originally numbered for attack on German aircraft industry now included in W.A.1.
W.A. 7	Attack on Fleet or on the bases of enemy surface, submarine and air forces operating against our trade. W.A.7(a) - Attack on Wilhelmshaven.	Being re-considered by the Naval and Air Staffs.
W.A. 8	Attack on specially important depots or accumulations of warlike stores other than air.	No plan possible in peacetime.
W.A. 9	Attack on the Kiel Canal.	Draft plan being considered at the Air Ministry.
W.A.10	Attacks on enemy shipping and facilities in German mercantile ports - precedence to be given to the Baltic.	Not practicable until Bomber Command has more long range aircraft.

Plan	Subject	Remarks
W.A.11	Attacks on forests.	W.A.11 was formerly attacks on enemy manufacturing resources which is now embodied in W.A.5.
W.A.12	Attack of the German Fleet or a section thereof at sea. (Being considered by the Air Staff).	Formerly this plan included attack in harbour as well as at sea. In or near harbour is now included in W.A.7.
W.A.13	Attack on enemy's headquarters and administrative offices in Berlin and elsewhere.	Not being planned as at the moment it is not sufficiently attractive.
W.A.14	The dropping of propaganda leaflets.	Ready to be carried out.

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# THE SPHERE OF MARITIME AIR OPERATIONS IN HOME WATERS 1914-1918

