

£88,588,600 FOR THE R.A.F.

COST OF EXPANSION

INCREASES IN MEN AND MACHINES

The Air Estimates for 1937 were issued yesterday (Stationary Office, 3s. 6d. net), together with a Memorandum by the Secretary of State for Air (Cmd. 5388, Stationary Office, 3d. net). The Memorandum is as follows:—

General Policy

The scheme for the expansion of the Royal Air Force announced in May, 1935, will be completed during the financial year 1937, and substantial progress will also be made in the further scheme announced in the Statement relating to Defence published in March, 1936 (Cmd. 5107). It may, therefore, be convenient to review the various decisions of his Majesty's Government and the successive stages by which the Royal Air Force has been built up to its present strength.

In 1919 his Majesty's Government decided that the permanent service should consist of 28 squadrons, seven being stationed at home and 21 overseas. This establishment was increased in 1920 to a total of 33 squadrons in all, inclusive of Royal Air Force units serving with the Fleet.

In 1923 it was decided that the bomber and fighter units in the Home Defence Force should be gradually increased to a strength of 52 squadrons. By the end of 1933 42 of these had been formed, and there were, in addition, five Army cooperation and four flying boat squadrons at home. Twenty-four squadrons, including one temporarily detached from home, were serving overseas and the equivalent of 13 squadrons with the Fleet Air Arm.

At this date the strength of the Royal Air Force was 3,450 officers and 27,050 airmen, and the entry in that year into training consisted of some 300 pilots and 1,600 other personnel. The number of stations with aerodromes at home was 52, and flying training needs were served by four schools, of which one was situated overseas.

During 1934 a new scheme of expansion was announced which involved the addition of 41 new squadrons to the Royal Air Force. Of these squadrons, the number allocated to Home Defence was 33, of which 23 were to be formed by April, 1935, and the remainder by April, 1936.

By the spring of 1935, however, it became apparent that change of circumstances had made this programme insufficient. In consequence it was announced on May 22, 1935, that his Majesty's Government had decided to proceed with a scheme designed to produce a Metropolitan Air Force of approximately 1,500 first-line aircraft by the end of March, 1937. This scheme (known in the Air Ministry as Scheme C) involved on the personnel side the recruitment of 2,500 pilots and over 22,000 other personnel in less than two years. It also involved the provision of a large number of sites and buildings, many new operational, training and other stations, together with a wide range of additional equipment and warlike supplies.

New developments in the international situation, however, necessitated yet a further review of defence requirements as a whole, and as a result a more comprehensive scheme of expansion, covering a longer period, was announced in the statement relating to defence of March, 1936 (Cmd. 5107). This programme (known as Scheme F), into which earlier plans were merged, involved an increase in the strength of the Metropolitan Air Force to approximately 1,750 first-line aircraft, together with provision for certain new squadrons overseas, and for increases in the Fleet Air Arm. Its most important features were, however,

under the conditions explained in the statement relating to Defence Expenditure (Cmd. 5374) and, but for this, the net total of the Votes for 1937 would have been £82,500,000. The corresponding net figure for 1936 was £50,700,000, so that the true net increase is £31,800,000.

The comparative figures for recent years are shown in the table printed below.

	1935	1936	1937
Gross Estimate	£31,002,100	£55,705,600	£88,588,600
Deduct Fleet Air Arm Grant	—	—	—
Deduct Other Air Appropriations	1,993,990	3,572,000	4,200,000
Net Estimate, apart from Loan provision	1,413,100	1,433,600	1,888,600
Deduct Loan provision	—	—	26,000,000
Net Estimate to be voted in 1937	27,596,000	50,700,000	82,500,000

NEW SQUADRONS

FIRST-LINE STRENGTH OF 1,750 MACHINES

As stated in the opening paragraphs of this Memorandum, the present scheme of expansion (Scheme F) provides for the addition of a Metropolitan Air Force with a first-line strength of approximately 1,750 aircraft. These 100 will be formed by the end of March. During the summer the number will rise to 124 squadrons, including 20 squadrons of the Auxiliary Air Force, with an approximate first-line strength of 1,500 aircraft. These 124 squadrons will subsequently be increased in size to give the necessary total first-line strength of 1,750 aircraft.

It is also proposed to create 10 special units of the Auxiliary Air Force for operating a balloon barrage in connection with the defence scheme for the London area. The work of organization is proceeding; orders for the necessary balloons and equipment have been placed, and deliveries are already being received.

One of the additional squadrons for overseas was formed in 1936, bringing the overseas strength to 26 squadrons.

Provision is taken for increasing the Fleet Air Arm from 217 to 278 first-line aircraft during the course of the year, in conformity with Admiralty requirements for aircraft carriers and catapult ships.

Vote A (Numbers) stood at a total of 50,000 officers and men in the original Estimates for 1936, and this was raised to 55,000 in the Supplementary Estimates taken in July last. Provision is now made for a total of 70,000. These figures are exclusive of officers and men serving on the Indian establishment.

To meet the requirements of the enlarged Metropolitan Force, a new system of command and administration was introduced in the summer of 1936. Under this scheme the Air Defence of Great Britain Command ceased to exist as such. The Royal Air Force at home, as now organized, consists of three Operational Commands, and one Training Command, the former controlling respectively the Bomber, Fighter, and Coastal Forces.

Personnel and Training

Vote 1 (Pay, &c., of the Royal Air Force) stands at £8,466,000 net, an increase of £1,776,000 over the corresponding provision for 1936.

The programme under Scheme C for the entry over a two-year period of some 2,500 pilots and over 22,000 airmen is now substantially complete. For the year 1937 entries of 1,500 pilots and some 15,000 airmen are required. The results which have so far attended the efforts to recruit personnel of high quality in these large numbers are a tribute to the air enthusiasm and patriotism of the younger generation, and the more difficult task of maintaining recruiting at a high level in numbers and in quality can be faced with reasonable expectation of success.

Attention must be called, however, to the large proportion of the whole entry which has to be drawn from young men and boys of good education. These are needed not only for service as pilots, but also for training as wireless operator, armorer, and observer, from which a large proportion of the observer personnel is found. In obtaining these classes much depends on the cooperation of those

ABSTRACT OF AIR ESTIMATES, 1937

	Estimates, 1937		Estimates, 1936	
	Gross Estimate	Net Estimate	Gross Estimate	Net Estimate
I.—NUMBERS:				
Maximum Number of Officers, Cadets, and Airmen to be borne on the Establishment of the Royal Air Force, exclusive of India	—	—	70,000	—
II.—EFFECTIVE SERVICES:				
Pay, &c., of the Royal Air Force	9,000,000	8,466,000	7,340,000	6,699,000
Quartermaster Stores (except Technical), Supplies and Transportation	4,600,000	4,476,000	3,482,000	3,336,000
Technical and Warlike Stores (including Experimental Works, Buildings and Lands)	48,112,000	31,542,000	30,340,000	26,546,000
Medical Services	18,535,000	4,000,000	9,498,000	9,350,000
Technical Training and Educational Services	466,000	439,000	405,000	382,000
Auxiliary and Reserve Forces	1,360,100	1,360,000	671,000	657,000
Meteorological and Miscellaneous Effective Services	1,449,000	2,315,000	908,000	760,000
Air Ministry	(a) 1,461,000	1,429,000	875,000	844,000
	1,264,500	1,250,000	1,050,000	1,040,000
Total Effective Services	£88,066,100	£56,018,000	£52,221,100	£50,256,000
III.—NON-EFFECTIVE SERVICES:				
Half-pay, Pensions and other Non-Effective Services	(a) 522,500	492,000	484,500	444,000
Total Effective and Non-Effective Services	£88,588,600	£56,500,000	£52,705,600	£50,700,000
Net Increase, £5,800,000				

(a) Certain non-effective charges in respect of staff for Meteorological Services are provided for under Vote 9 (Meteorological and Miscellaneous Effective Services). The appropriations-in-aid include sums aggregating £26,000,000, which, subject to statutory authority being obtained in accordance with the terms of the Defence Loans Bill now before Parliament, will be provided by issues from the Consolidated Fund. The net total of Air Estimates before deducting the sum to be received from this source is £82,500,000.

SWINTON
PHILIP SASSOON
Air Ministry, Feb. 22, 1937.

E. L. ELLINGTON
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process of formation, and negotiations will be opened during 1937 for the creation of still further centres.

Plans are in contemplation to enter personnel for observer, equipment, and medical duties through the medium of the Volunteer Reserve. It will also be possible, within the general framework of this scheme, to enter personnel for other duties as and when the need arises.

Technical Equipment

Before deducting the sum of £12,000,000 provided by loan, the net total of Vote 3 (Technical and Warlike Stores) is £43,542,000; the corresponding figure for 1936, including the amount taken in the Supplementary Estimate, was £26,546,000. The large increase is attributable in the main to payments maturing in the course of the year on long-term contracts which have already been placed in respect of aircraft, equipment, and other technical stores.

The increased expenditure falling on this Vote is indicated by the fact that the net provision for 1937 (before deduction of the Loan appropriation-in-aid) is more than six times the corresponding figure for 1934; a further increase will be required in 1938 to cover commitments under the programme now in process of execution.

After the initial requirements for new squadrons have been met, and squadrons equipped with older types of aircraft have been rearm, deliveries of new types of aircraft will be applied to the accumulation of reserves to the requisite scale. The new types for the Metropolitan Force are of monoplane construction incorporating modern devices for high performance under service conditions. Engines of the latest design will be employed, including the sleeve-valve type. Special attention has also been given to improving and simplifying aircraft equipment, including instruments, wireless apparatus and armament.

Provision is made in Vote 4 for the capital expenditure on the construction and equipping of "shadow" factories to which reference is made above, but the current cost of manufacture of the airframes, engines, and other equipment produced falls on Vote 3. In this latter Vote also provision is made for reserves of equipment (including petrol and oil) as well as for the establishment of stocks of essential raw materials.

Research, &c.

Side by side with the rapid expansion in production, the aircraft industry has experienced a phase of rapid change in design and methods of construction. In consequence, provision has had to be made for an accelerated and extended programme of research and development on aircraft and engines to deal with the wide range of new problems which have arisen. Research into armament problems and into the development of new methods of

classes of skilled labour in the building industry may make it difficult to maintain the same rate of progress.

It has again been necessary to postpone a number of reconstruction services at existing stations in favour of more urgent work, and provision for reconstruction and replacement has been limited to services which admit of no further deferment.

The new Royal Air Force station at Dhibban in Iraq is nearing completion, and a portion of the station has already been occupied by units transferred from Mosul. Provision has been made for the receipt of the sum which the Iraq Government has undertaken to pay for the cantonments at Hinaidi and Mosul, which are to be vacated by the Royal Air Force, in accordance with the terms of the Anglo-Iraq Treaty of 1930.

In view of the conclusion of the Treaty with Egypt, sites are being selected for the new Royal Air Force stations which are to be constructed by the Egyptian Government in the Canal zone.

CIVIL AVIATION EXTENSION OF EMPIRE AIR ROUTES

The net total of Vote 8 (Civil Aviation) stands at £2,315,000. This represents an increase of £1,555,000 over the corresponding figure for 1936. This large increase arises directly from the major developments of policy with which Parliament is already familiar—the inauguration of the Empire air mail scheme; the extended organization of Empire air routes; experimental overseas flights, including flights across the North Atlantic Ocean; the purchase of Heston airport; and the creation of the air traffic control organization in the United Kingdom to carry out the recommendations of the committee under the chairmanship of Sir Henry Maybury.

According to the present programme, the complete Empire air mail scheme for the carriage of first-class mail on Empire air routes, for the most part without surcharges, will begin in 1938. In 1937, however, there will be an "introductory" period during which the scheme will be brought into operation gradually over the different routes, as aircraft and the necessary ground equipment become available.

A feeder service in connexion with the Empire air mail scheme will be operated between Kijumi, Nairobi, and Lusaka. The service to West Africa, which connects with the main England-Africa route at Kharar, is now being operated as far as Lagos (Nigeria) and will be extended to Accra and

to deal rapidly and in concert with current questions of international and Imperial air communications.

Radio Facilities

For some years increasing attention has had to be given to the question of providing for the development of civil aviation within the United Kingdom in the manner most advantageous to the requirements of the various aviation interests concerned, and at the same time most desirable from the public point of view; and provision has been made in recent Air Estimates for a measure of assistance to be provided from public funds, in the form of the establishment of a number of State radio installations for the benefit of aviation, at certain selected centres. In order, however, to secure that more adequate consideration should be given to the question in all its aspects, an interdepartmental committee was appointed, as indicated in the Memorandum accompanying Air Estimates, 1936, under the chairmanship of Sir Henry Maybury.

The committee's report recently rendered (Cmd. 5351) is based upon a very full view of all factors entering into the development of civil aviation and the conduct of civil flying generally in this country, and makes a number of far-reaching recommendations to his Majesty's Government. Chief among these is the recommendation that all radio facilities and a comprehensive air traffic control organization, adequate to ensure the safety and regularity of air communication at all times in the United Kingdom should be provided, maintained, and operated (at the present stage of progress) by the Government, in addition to the meteorological organization required for internal flying. At the same time the committee recommends that a system of licensing of regular air services throughout the country should be instituted, and that, in order to enable definite information to be obtained as to the country are most likely to become self-supporting, a group of selected services should be operated under the most favourable possible conditions, competition being avoided by granting an exclusive licence to a selected operating company or combination of companies in respect of these particular services.

The recommendations made have now been fully considered by his Majesty's Government, and those which involve action by the Air Ministry have been approved in principle. His Majesty's Government wish to record their thanks to the chairman and members of the committee for the valuable work which the inquiry has entailed and for the valuable advice which has been tendered.

Following on the approval of the recommendations of the committee, a sum of approximately £100,000 has been included in these Estimates under the appropriate sub-heads, mainly as a first instalment of the cost of giving effect to the recommendation that the radio and control organizations which are necessary, should be provided at State expense.

Since its opening in 1928 the aerodrome at Heston has played an important part in the service of civil aviation, and it is clear that this aerodrome-to-day provides essential facilities both for internal and for international purposes. Information was received that the owners of the aerodrome had decided to restrict their activities to a provision of part of the airport. After endeavours had been made to induce the local authorities concerned to acquire the aerodrome as a municipal airport, a decision was reached and announced to Parliament that the Air Ministry in respect to the requisite Parliamentary sanction being obtained, should purchase the site, together with a sufficient area of adjoining land, for an enlarged airport, in order to preserve the site from being built over. Provision has accordingly been made for expenditure on this service, among other purchases, during 1937.

The Bill, referred to in the Memorandum accompanying the Air Estimates of last year, for amending the Air Navigation Act of 1920 and giving effect to certain recommendations of Lord Gorell's Committee, was duly passed and received the Royal Assent on July 31, 1936, as the Air Navigation Act, 1936. In accordance with Section 2 of this Act, a new body has been set up, to which certain functions now exercised by the Secretary of State for Air will be devolved. These functions are mainly concerned with the design and

the force designed to increase its striking power and so to provide a more effective deterrent against any possible aggressor, and secondly, the provision of war reserves of aircraft and equipment of all kinds on a far larger scale than has hitherto been contemplated. As a corollary, it envisaged the organization in industry of a war potential to supplement the capacity of the aircraft industry and to provide for greatly increased production in time of war.

SUBSTANTIAL PROGRESS

The dispatch of a number of Royal Air Force squadrons to the Middle East in the autumn of 1935 had already involved some dislocation in the programme of expansion, but apart from this, the introduction of the larger Scheme F programme necessarily involved some postponement of the completion of Scheme C. It became necessary, for example, to concentrate resources in training establishments which would otherwise have been available for the manning of operational units. In fact, however, the completion of the Scheme C programme has been further retarded as the result of delays in the delivery of airframes. A large measure of reliance justifiably has to be placed on the forecasts of the manufacturing firms, and these forecasts have proved in practice to have been too optimistic. Several causes have contributed to this—the time taken to organize production on a much larger scale than heretofore, the shortage of skilled labour, and initial difficulties in regard to the perfecting of new types which have been put direct into production. Even so, in spite of the fact that the greatly increased capacity of the factories is only partly evidenced by the output up to date, actual deliveries of Service aircraft during the last 11 months amount to over 2½ times, and of engines over 3½ times, the average annual re-expansion output. The number of persons employed in the aircraft industry has increased to 63,000, and it must be borne in mind that this figure takes no account of the many thousands of persons employed in the production of armament and equipment by firms engaged on ancillary work for the aircraft industry.

Substantial progress has also been made in other directions. On April 1, 1937, the Royal Air Force will comprise 100 squadrons stationed at home, the equivalent of 20 squadrons serving with the Fleet Air Arm, and 26 squadrons serving overseas. The strength of the Royal Air Force will have risen to 4,850 officers and 51,000 airmen. The expansion has necessitated a very large works programme, both in enlarging existing Service stations and in creating and equipping new stations of various kinds. Progress on this work, particulars of which are given later, has hitherto been satisfactory. Flying training is now carried out at 13 civil flying schools, in addition to the Service flying training schools, the number of which has been increased from four to 11. Increases have also been made in the other training and maintenance establishments.

On the industrial side, additions have been made at existing aircraft manufacturing firms, and in order to broaden the basis of production certain firms have, with Air Ministry approval, entered into agreements with firms outside the industry, which will enable the resources of these latter to be used for the production of aircraft. In addition, a number of firms have agreed to erect and manage "shadow" factories for the Government. Six factories for the manufacture of engines are in the course of erection, and most of these will be completed within a few months. One airframe factory is nearing completion, and work on the second has commenced. New factories are also being established for the manufacture of aircrews and certain types of bombs.

Detailed information on these and various other matters is given in the succeeding sections.

Financial Summary

Air Estimates for 1937 amount to a total of £88,588,600 gross, after making due allowance for under-spending which the Government has shown to be necessary. The comparable total for 1936 was £57,705,600, including the additional sum granted by Supplementary Estimate in July last.

The net total is £56,500,000. Allowance has been made for a special appropriation-in-aid of £26,000,000 from the Consolidated Fund

to whom it falls to advise youths as to their future on leaving school. The education by headmasters, local education authorities, and other concerned of the opportunities which the Air Force offers, and of the needs of the country in air defence, has ensured the supply of these entries up to now, but their continued support will be required to enable the large demands which lie ahead to be met.

As the training of boys entered as apprentices extends over three years, it was not to be expected that the large requirements of the rapidly expanding Force could be wholly provided from this source. The experiment was, therefore, tried of supplementing the apprentice-trained entrants by a short class of recruits directly entered for training as mates to skilled fitters. The best of these have been selected for further training as flight mechanics and flight riggers to undertake, under supervision, the maintenance work carried out in flights. The experiment has so far been successful; a considerable majority of entrants have proved fit for the further training, and those who have now gone out of the training establishments into service units have fulfilled expectations. Indeed, a fair number have been found to justify advanced training to the stage of fully qualified fitters, as it is expected that as time goes on it will be possible to advance a substantial number to this high standard.

The training of pilots has proceeded with marked success, though this has only been possible by sustained efforts on the part of the 13 civil schools and the 11 Service schools on which the work has fallen. Both types of school have proved equal to the demands made upon them, which include not only modern flying instruction than in the past, but also more advanced training in instrument flying, night flying, navigation, and training in air gunnery and bombing. The growing importance of navigational training has also been recognized in the creation of a new School of Air Navigation at Cranston.

The normal training exercises which are carried out by the units of both home and overseas Commands were limited in 1936 by the effects of the Mediterranean emergency, but during the past few weeks intensive command flights by overseas squadrons have been carried out on a larger scale than previously attempted. For instance, to take part in a combined operations exercise, the 1st Bomber Squadron from India and one from Iraq, supported by bomber transport aircraft and to that station. At the same time, a bomber squadron was flown from Egypt to the North-West Frontier of India.

AUXILIARY AIR FORCE

Vote 7 (Auxiliary and Reserve Forces) stands at a net total of £1,360,000, which represents an increase of £709,000 over 1936.

Following the policy announced in 1936, four out of the five Special Reserve squadrons have been converted to Auxiliary Air Force squadrons, and the necessary steps for conversion of the remaining squadron are under consideration. Four additional Auxiliary Air Force squadrons are also being formed, and the Force will then consist of 20 squadrons. It is also to be noted that the balloon barrage organization outlined earlier in this memorandum will be established on an Auxiliary Air Force basis.

Reserves

To meet the large increase of reserve personnel now necessary, a new organization known as the Royal Air Force Volunteer Reserve is being created. This scheme provides for the entry of young men, who serve as pilots while continuing their civil occupations. It is hoped that not less than 800 will be recruited in 1937. The new unit will give 15 days' continuous aircrew training annually, but the distinctive feature of the scheme is that the rest of the training will be carried out in the evenings and at week-ends.

Aerodrome centres of the Volunteer Reserve are being established, with town centres in the adjacent towns. These aerodrome centres will be managed by civil firms, who will provide the flying training, while the general organization will be in the hands of the Air Ministry. The aerodrome centres, as the local representatives of the Air Ministry, will be responsible for the recruitment, training, and maintenance of the Reserve, Royal Air Force. The first centres to be ready will be those located at the 13 civil schools, which are now carrying out the elementary flying training of regular and reserve pupils. Ten other centres are in

air defence has also required increased study and expenditure. On all aspects of this extended research programme the Air Ministry has had during the past year the advice and assistance both collectively and individually of a number of eminent scientists. The greatest importance is attached to this co-operation.

Apart from problems of immediate urgency in connexion with air defence and those which arise from the present production programme, the needs of the future are being covered by an extended programme of research and development. This includes a number of aircraft and engines of new design to meet the latest operational requirements.

In the course of a programme of experimental flying intended to aid the development of engines capable of operating at great heights, the altitude record for heavier-than-air aircraft was recaptured by the Royal Air Force.

MORE AERODROMES

THE SHADOW FACTORIES

Before deducting the sum of £14,000,000 to be provided for by loan, the net total of Vote 4 (Works, Buildings, and Lands) is £18,000,000. The increase of £8,650,000 over the total provision voted by Parliament for 1936 is due to the further progress expected on the programme of capital expenditure on lands and buildings, including the construction and equipment of "shadow" factories.

Extensions, either permanent or temporary in character, have been carried out at 34 of the 52 aerodrome sites which existed at home at the end of 1933. Thirteen additional aerodrome sites are now in occupation, and, in addition, five civil aerodromes have been equipped and are being used for service purposes. Work is in progress on another 26 sites and further sites will be acquired during the course of the year.

As regards maintenance organization, two of the nine sites without aerodromes which are needed have already been acquired, and negotiations for four more have commenced. Negotiations are in progress also for sundry areas of land required for ranges, headquarters and medical units, W/T stations, &c. Overseas, sites for seven new stations have been or are in course of being acquired, and three more have been selected.

As explained in the Memorandum accompanying Air Estimates, 1936, it has been necessary, in order to meet immediate requirements for the accommodation of new units, to resort to improvised accommodation of a purely temporary character pending the completion of permanent buildings. Arrangements for the early replacement of these temporary camps are well in hand. Contracts were placed for 15 of the 29 large new squadron stations in 1935 and 1936, and for five of the new permanent flying training schools. Satisfactory progress with these contracts has been maintained, and several are now nearing completion. Two of the three new permanent training camps for which contracts were placed in 1936 are now occupied, and arrangements for the provision of five more are being made.

In addition to the contracts for complete stations referred to above, contracts have been placed for the hangars required for another 16 stations.

New Training Centres

In 1937 contracts will be placed for the construction of permanent accommodation at six new operational stations at home and six new operational stations overseas. Contracts will also be placed at home for one new flying training school, two new permanent training camps, two new equipment depots, a new aircraft repair depot, a new hospital, and a number of storage units, including reserve storage for petrol and ammunition. Financial provision has been made for the works and lands services necessitated by the scheme for a balloon barrage and for the Volunteer Reserve training scheme.

In order to broaden the basis for the supply of materials and labour for new buildings, varying methods of construction have been adopted. For example, at a number of stations various forms of concrete have been substituted for brick in technical buildings, whilst storage accommodation is being provided in various designs to suit the materials most readily obtainable.

Although progress with the extensive building programme has been satisfactory up to the present, the increasing demands on certain

aerodromes at these places are ready. Passengers cannot be carried until anti-aircraft precautions have been completed at the stopping places in Nigeria, but the subsidy provision (£25,000) included in the Estimates is on the basis of a full passenger service.

A provisional air service between Penang and Hong-kong was started in March 1936, by Imperial Airways, Limited, pending completion of the negotiations with the Siamese Government for the operation of a regular service from Bangkok.

It is hoped that the projected air service between Bermuda and New York, to be operated by Imperial Airways, Limited, in cooperation with Pan-American Airways Incorporated, will be inaugurated in April next. Money provision has accordingly been made for the agreed annual subsidy of £18,000 payable to Imperial Airways, Limited, for this service, and the appropriations-in-aid subhead includes an amount of £3,000 on account of the annual contribution by the Government of Bermuda.

For their European services the provision of £50,000 as subsidy payment to Imperial Airways, Limited, represents a full £15,000 on the figure for 1936, under the terms of the agreement with the company.

Following upon the preliminary service operated by British Airways, Limited, over the route London-Amsterdam-Hamburg-Copenhagen-Malmö, an agreement was concluded with the company, on July 16 last, for a regular daily service in each direction for passengers, mails, and freight between London and Stockholm, and for a night mail service between these capitals, via Cologne and Hanover, under a pooling agreement between the company and the Swedish transport company, A.B. Aerotransport (see Cmd. 5203). So far as the night service is concerned, as a temporary arrangement British Airways, Limited, are operating five nights a week (Monday-Friday) in each direction between London and Hanover, connecting with an existing night service operated by the Swedish Company between Stockholm and Hanover. A subsidy payment of £25,000 to British Airways, Limited, under the terms of the agreement is allowed for these services.

A sum of approximately £700,000 has been included for the work of improving the ground facilities on Empire air routes. This includes a further grant of £125,000 to the Government of Newfoundland towards the cost of the air base at Botwood. Provision has also been made for a contribution to the proposed air base at Portsmouth in accordance with arrangements provisionally negotiated with the Municipal Authorities.

The formidable task of providing the necessary ground organization and equipment in connexion with the establishment of an air service across the North Atlantic is being actively pursued, and investigations into the meteorological requirements of the route are in progress. Various methods of operation most suitable for Transatlantic flying. The tests will also reveal the possibilities of adapting these methods to meet the varying demands of British air routes elsewhere. Experimental flights by both landplanes and flying-boats will be carried out during 1937. In preparation for these flights two flying-boats of the "Empire" type have been fitted with special fuel tanks, and long-distance training flights with them are now taking place. It is also hoped that useful experience will be gained in the course of which reference has already been made to the service of the Bermuda-New York service, to the staff required for the assessment and training of production costs. At the same time all proposed increases are carefully scrutinized. The inevitable dispersal of large sections of the staff in buildings separated from the central office has added seriously to the difficulties of administration.

A new directorate for assisting the supply work of the Ministry—the Directorate of Aeronautical Production—was created in April last, and has proved of great value in the handling of production problems.

The Department of the Director-General of Civil Aviation has had an increase of work corresponding to that in other departments of the Ministry, resulting from the major developments of civil aviation policy outlined earlier in this memorandum. Additions to the staff of the Director-General are in progress.

The machinery of the interdepartmental committee which was set up in May, 1935, under the chairmanship of Sir Warren Fisher, is enabling all Departments of State concerned

with the issue and renewal of certificates of airworthiness. The Ministry has completed at the stopping places in Nigeria, but the subsidy provision (£25,000) included in the Estimates is on the basis of a full passenger service. The body will have been agreed between the Air Ministry and the interests concerned, with the approval of the Treasury, that four-fifths of the deficit work during the first five years of operation shall, subject to a maximum total payment of £60,000 over this period, be met from Air Votes.

A sum of £35,000 has been allowed in respect of subsidies to light aeroplane clubs in 1937. This should allow further clubs in addition to the 48 clubs approved at present to be admitted to the new subsidy scheme, which will replace the present scheme at the end of March, 1937. Five thousand pounds has again been included as subsidy for the development of gliding.

METEOROLOGY

The net provision made for the meteorological service is £248,000, representing an increase of £67,000 over the figure for 1936. The increase is directly due to the expansion of the Royal Air Force and to the development of British civil air transport at home and abroad.

A considerable increase in the number of local meteorological offices on aerodromes in this country is contemplated. Fifteen thousand pounds has been provided for new buildings at home, and £7,000 for additional staff, together with £3,000 for searchlights, a special type designed for the rapid and accurate determination of cloud height at night. In addition, the arrangements for the collection and distribution of meteorological messages are being organized, and £15,000 has been provided for improved means of communication within the network of meteorological units.

The use of civil air transport as a rapid means of world communication is demanding increased international co-operation in the meteorological field, and Regional Commissions, on which the Empire is actively represented, have been formed within the existing international organization to deal with local aspects of the application of meteorology to aviation. In close association with these international arrangements an extended meteorological organization is being created for Empire air routes by cooperation between the meteorological departments of the Empire. While this organization as a whole is being provided on a cooperative basis, payments will be made to certain Governments (mainly Empire Governments) for certain special services. Provision for these payments to the amount of £19,000 is made in a new subhead.

Air Ministry

Vote 10 (Air Ministry), at a net total of £1,250,000, shows an increase of £210,000 over the provision for 1936.

The conditions of work at Headquarters have increased in intensity. There is not only the growth in the volume of the work in all departments of the Ministry, but the expansion programme is producing new problems as it proceeds, both for the Air Staff and for the administrative services. There is also a large and increasing degree of correlation demanded with other Departments of State. These factors have necessitated the addition of staff in all grades, and the creation of certain new branches. Special attention has been paid to the staff required for the assessment and training of production costs. At the same time all proposed increases are carefully scrutinized. The inevitable dispersal of large sections of the staff in buildings separated from the central office has added seriously to the difficulties of administration.

A new directorate for assisting the supply work of the Ministry—the Directorate of Aeronautical Production—was created in April last, and has proved of great value in the handling of production problems. The Department of the Director-General of Civil Aviation has had an increase of work corresponding to that in other departments of the Ministry, resulting from the major developments of civil aviation policy outlined earlier in this memorandum. Additions to the staff of the Director-General are in progress.

SWINTON.

Air Ministry, March 1, 1937.