1948

NEW ZEALAND

AIR DEPARTMENT

(REPORT ON THE) FOR THE YEAR 1947–48

Presented in pursuance of Section 7 of the Air Department Act, 1937

REPORT BY THE HONOURABLE F. JONES, MINISTER IN CHARGE OF THE AIR DEPARTMENT, FOR THE YEAR ENDED 31st MARCH, 1948

MR SPEAKER,—

I have the honour to present to Parliament the report of the Air Department for the year ended 31st March, 1948, embracing the activities of the Royal New Zealand Air Force and the Civil Aviation and Meteorological Branches.

REPORT BY THE CHIEF OF THE AIR STAFF FOR THE YEAR ENDED 31st MARCH, 1948

The Hon. the MINISTER OF DEFENCE, Wellington.

I HAVE the honour to submit the following report on the Royal New Zealand Air Force for the year ended 31st March, 1948.

This report may be regarded as complementary to the previous annual report since both are concerned with the activities of the Air Force during the "interim" period. This period has been characterized by the abnormal and unstable conditions arising from the war. During the "interim" period the R.N.Z.A.F. has been faced concurrently with three major commitments, all of which have been conflicting in their demands on the limited resources available—firstly, the orderly contraction of the wide range of war activities which still involves the diversion of considerable man-power; secondly, the reorganization and training of the R.N.Z.A.F. under peacetime conditions; and, finally, the fulfilment of various operational commitments which have proved a strain on the relatively small trained elements in the Force. The capacity of the Air Force to-day in relation to these commitments is even less than it was twelve months ago.

Commitments and priorities have changed, and increasing emphasis must now be placed on the reconstitution of the Air Force in accordance with the plans approved by the Government last October. The prime objective of the Air Force in peace is to train personnel to a high standard and to build up an efficient Force which can meet the stress of expansion in emergency with speed, economy, and efficiency. The maintenance and operation of a modern Air Force demands high technical skill and experience, which take some years to attain. Personnel enlisted into the Air Force, particularly for technical duties, must be of sufficient calibre to undertake the instruction offered and reach the standards required. The recruiting campaign has not yet attracted sufficient personnel of this standard. Further publicity on the opportunities in the Air Force is therefore needed, and it may additionally be necessary to establish an apprentices school to attract better entries on leaving school.

The strength of the Air Force at 31st March, 1948, was 434 officers, 2,283 airmen, and 130 Women's Auxiliary Air Force, which is two-thirds of the strength twelve months ago. All "interim" service engagements expire at the end of March, 1948, which will cause a considerable drop in effective strength. For various reasons, it has not been possible to develop technical training courses to the degree necessary for the reconstitution of the Air Force until early in 1948. The product from such courses will not in general become effective until late in 1949, so that on present indications there will be little relief from the present shortages in trades for at least a further twelve months.

The major commitments during the year under review continued to be the segregation, custody, and disposal of surplus equipment in conjunction with the War Assets Realization Board, the operation of a weekly air transport schedule (No. 41 Transport Squadron) between New Zealand and Japan in support of the New Zealand Contingent of the British Commonwealth Occupation Force, and the maintenance of No. 14 Fighter Squadron in Japan. During the year a total of 63 Mosquitos were flown out to New Zealand. The first squadron to be equipped with Mosquitos is No. 75 (Bomber) Squadron at Ohakea which is being expanded as personnel become available. No. 5 Flying-boat Squadron, equipped with Catalinas, is maintained on a skeleton basis in Fiji.

A satisfactory degree of co-ordination between the three Services is being steadily developed through the activities of the Chiefs of Staff Committee and the Principal Administrative Officers Committee. In addition, a defence science organization has been established, embracing civilian and Service scientific research which will enable New Zealand in due course to play its part in this vital aspect of Commonwealth defence.

Close liaison with the Royal Air Force has been maintained during the year by visits of Service aircraft and specialized teams from the Empire schools, by the interchange of officers, and the establishment of two R.N.Z.A.F. crews in No. 24 Commonwealth Squadron. As the R.N.Z.A.F. obtains the greater benefit from these forms of liaison, which represent a most economical means of maintaining operational efficiency, they should be developed to the maximum extent.

During the year the Air Force has been engaged on a number of miscellaneous flying activities of economic value to New Zealand.

In May, 1947, the Chief of the Air Staff visited the United Kingdom to participate in Commonwealth inter-Service exercises and Conferences.

Operations

Squadron Activities.—In Japan No. 14 Squadron, manned to a reduced level from December, 1947, continued as the Air Force component of the New Zealand Contingent of the British Commonwealth Occupation Forces. The squadron moved from Iwakuni to Bofu in February, 1948, and continued to take its full part in all occupation air activities. As well as security and anti-smuggling patrols over the B.C.O.F. area, the squadron participated in mass international fly-pasts at Tokio on several occasions, including the day of the Royal wedding. Based at Lauthala Bay, Fiji, No. 5 Squadron, equipped with Catalina flying-boats, continued to provide search and rescue facilities in Fiji and Hobsonville (New Zealand), to which a flight of two aircraft is detached. Since N.Z.N.A.C. took over the South Pacific Regional Services, No. 5 Squadron has carried supplies and R.N.Z.A.F. personnel between New Zealand and Fiji, in addition to carrying out "mercy" flights to outlying islands of the Fiji Group and to the Chatham Islands. Flights to Gilbert and Ellice Islands and the Solomons have also been undertaken for the Western Pacific Administration. No. 75 Squadron, which is based at Ohakea, was mainly employed in flying Mosquito aircraft from England to New Zealand, and is only now in the process of re-forming as an operational entity. During the period under review 57 Mosquito aircraft were flight delivered to New Zealand, bringing the total now in New Zealand to 63. Royal New Zealand Air Force crews flew out 27 aircraft, R.A.F. crews 6, and the remaining 24 were flown by R.A.F. pilots with R.N.Z.A.F. navigators. No. 75

Squadron also operated a Meteor Jet aircraft on loan from the R.A.F. in experimental and familiarization flying. The R.N.Z.A.F. have attached two complete transport crews, consisting of ten aircrew personnel, to No. 24 Commonwealth Squadron, date of attachment 1st April, 1947, for a period of two years.

Co-operation with other Services.—A series of naval co-operation exercises were carried out by Mosquito and Harvard aircraft with the H.M.N.Z.S. "Bellona" with the object of providing training for both air and naval crews (November–December, 1947). The Royal Navy aircraft carrier H.M.S. "Theseus" visited New Zealand in August, 1947, and 25 Navy aircraft, together with aircrew and maintenance personnel, were based at Whenuapai, where they carried out extensive flying operations from 30th August to the 13th September, 1947. Harvard aircraft co-operated with the Army in the calibration of the Searchlight Control Radar in the Wellington area (May, 1947). Mosquito aircraft also undertook Army co-operation exercises in connection with Army artillery shoots (June, 1947). With a view to providing A.O.P.s for the Army, flying training in this sphere has commenced, 7 Army officers having completed the first stage of this training.

R.A.F. Liaison Visits.—During the year 3 Lincoln aircraft of the Royal Air Force brought specialist liaison teams to New Zealand from the Empire Air Navigation School, Central Bomber Establishment, and the Empire Radio School. In each case lectures covering the latest trends in air defence, operational technique, and the application of modern equipment were given. Such visits provide the R.N.Z.A.F. with the valuable information and, besides keeping us in touch with overseas developments, they provide an avenue for the necessary practical integration of the Commonwealth Air Forces.

Statistics.—A summary of flying statistics is given at Appendix A. The level to which the maintenance capacity of the R.N.Z.A.F. has fallen is reflected in the decrease in the number of hours flown during the year under review: 1946–47, 38,094 hours; 1947–48, 20,927 hours; reduction, 17,167 hours. The drop in flying-hours, however, as shown above is partly due to the transfer of R.N.Z.A.F. Air Transport Services to the New Zealand National Airways Corporation.

Miscellaneous Flying Activities

The Air Force can be usefully employed with considerable economy, subject to overriding Service requirements, on a variety of flying activities of considerable value to the State. These activities may be grouped broadly as follows:—

(i) Services for State Departments, which may cover the provision of emergency precautions organizations, surveys, forestry and fishery patrols, aircraft rescue, transport to inaccessible country, soil conservation, manuring, seeding, &c.

(ii) Scientific research, in which the Air Force is used as the medium for investigations into radio propagation, cosmic-ray activity, &c., and fundamental aeronautical research.

With regard to (i), an Inter-departmental Committee for the co-ordination of miscellaneous air services required by State Departments was established in 1946. The Committee has made some progress in the investigation of the problems involved, and useful work has been accomplished both by the R.N.Z.A.F. and the Public Works Department. No. 41 Squadron, with Dakota aircraft, has supported extensive deer-culling operations by air dropping supplies and huts to ground parties, and has dropped willow and poplar in the Gisborne area for soil-conservation purposes. The provision of light aircraft for forestry fire patrols at Rotorua during the fire-hazard season has been continued. These patrols are backed by a more extensive emergency organization at Ohakea. At all Air Force flying stations there are now facilities capable of providing the following services in case of a national emergency: supply dropping, dropping of type M dinghies, and the stretcher evacuation of casualties. Research into the anomalous

propagation of radio waves, which was carried out by Anson aircraft operating from Wigram under the control of Department of Scientific and Industrial Research, was concluded in December last.

Air Transport Services

Responsibility for the operation of quasi-civil transport services in New Zealand was terminated on the 31st May, 1947, when N.Z.N.A.C. took over the operation of the R.N.Z.A.F. internal air service performed by No. 40 Squadron. The South Pacific regional service was similarly taken over by the Corporation on the 1st November, 1947. The transfer of both these services was accompanied by the transfer of Sunderland and Dakota aircraft, and an appropriate backing of aircraft equipment and key operating personnel. Service air transport commitments of the R.N.Z.A.F. have been confined to the operation of weekly courier services between New Zealand and Japan.

After two years of continuous operation this courier service will shortly be terminated, bringing to a close a chapter of R.N.Z.A.F. air transport activity that reflects great credit on the aircrews and servicing personnel associated with the courier service. The route to Japan of some 13,000 miles via Norfolk Island, Australia, Morotai, Philippines, and Okinawa possessed limited facilities and involved approximately ninety hours flying through weather and seasonal conditions that differed to extremes. Following the Government's decision to close Rongotai Aerodrome in October, 1947, the general Purpose Flight was moved to Ohakea. This flight provided essential air "lifts" in New Zealand and carried out extensive fire-patrol duties at Rotorua during the summer months. A summary of air transport statistics is given in Appendix C.

Ancillary Services

Meteorological Services.—The Meteorological Service required by the Air Force is provided by the Meteorological Branch of Air Department. The report of the Director appears in a separate section of this report. The extent of the service available during the year has, of necessity, been on a restricted scale due to shortage of staff.

Air Traffic Control Division.—The direction of the single flying control organization within New Zealand has been transferred from the R.N.Z.A.F. to the Civil Aviation Branch of Air Department, but the appointment of the Director of Air Traffic Control (D.A.T.C.) in the R.N.Z.A.F. is also held by the Controller of Air Traffic Control, Air Department. The Air Traffic Control Division is concerned with the movements of both civil and military aircraft within the New Zealand control area, and its organization is such that in case of national emergency it may readily revert to the operational control of the R.N.Z.A.F. as part of the air defence system.

Air-sea Rescue.—The Air Force maintains aircraft at readiness for search and rescue duties in accordance with New Zealand international obligations under the provisions of ICAO. Search and rescue activities are co-ordinated by the Air Traffic Control organization. During the year the Air Force has taken part in a total of thirty-five search and/or rescue operations, comprising searches for missing launches and aircraft and flights to the Chatham Islands and Pacific Islands to evacuate urgent medical cases.

Aeronautical Research

This year has seen the establishment of a defence science organization which comprises a Defence Scientific Advisory Committee and a Policy Committee (on a Chiefs of Staff level), together with subsidiary technical panels and a general secretariat (drawn from Department of Scientific and Industrial Research), responsible for research into such defence science projects as can be suitably prosecuted in New Zealand, and for participation in Commonwealth projects elsewhere. In order to implement these activities and to build up a satisfactory liaison between the Armed Forces and civilian science, a Defence Scientific Corps has been established and will be shortly recruited from University honours graduates.

The activities of the above organization are co-ordinated by the Commonwealth Advisory Committees on Defence Science and Aeronautical Research, at both of which New Zealand has recently been represented.

As far as aeronautical research is concerned, which makes a major contribution to defence science, a local Aeronautical Research Committee was established in June, 1947, to advise the Government on these matters and to select candidates for the Government scholarship at the College of Aeronautics (U.K.).

The R.N.Z.A.F. has fostered a close liaison with the two University Engineering Colleges at Auckland and Christchurch and provides facilities at adjacent stations for workshop practice of aeronautical students. It is hoped that the establishment of the Auckland Engineering School at the R.N.Z.A.F. Station, Ardmore, will lead to a closer liaison, permitting active flying research to be carried out by the Air Force and advanced students at the college.

Personnel

The interim-service period expired on 31st March, 1947. A proportion of the personnel serving in the Interim Force have been absorbed in the Regular Force, the remainder elected either to be discharged or to continue on a temporary basis. The manning position at the end of March, 1948, was as follows:—

	Officers.	Airmen/ W.A.A.F.	Total.
Permanent service	142	231	373
Short service (two to eight years)	168	1,530	1,698
Temporary service	124	652	776
	434	2,413	2,847

Officers.—Selections of officers for permanent and short-service commissions to fill the bulk of vacancies in all branches were in the main completed during the year, with the result that the staffing in officers has become more stable. Those personnel who accepted employment in New Zealand National Airways Corporation after the Corporation took over internal and regional services were transferred to the Reserve. Similarly, personnel who accepted engagements in the Air Traffic Control organization have also been transferred to the Reserve. To conform with R.A.F. practice, the R.N.Z.A.F. adopted the new R.A.F. aircrew scheme, which provides for an entirely new system of titles, ranks, badges, and channels of advancement for non-commissioned aircrew. Releases during the year amounted to 307 officers and 58 N.C.O. aircrew.

Manning.—Releases during the year totalled 1,632 airmen. This virtually completes the demobilization of wartime personnel and brings the total number of airmen released from VJ Day to the 31st March, 1948, to 33,874. As experience has shown that the inflow of recruits is negligible when publicity campaigns are not operating, emphasis is being given to recruiting publicity. Results to date have been encouraging in certain respects only, as personnel for domestic and equipment trades are not forthcoming in balanced numbers in comparison with those enlisting for technical duties. Under the Government-approved scheme to recruit 350 ex-R.A.F. tradesmen in England, 64 airmen have already arrived in New Zealand. These airmen were given special courses to acquaint them with conditions in the R.N.Z.A.F., and all appear to have settled in to their new employment very creditably.

To align the ground trades with technical developments and peacetime requirements and in line with R.A.F. policy, the trade structure of the R.N.Z.A.F. has been reorganized and regrouped, and airmen have been mustered where now appropriate to the new trades

W.A.A.F.—The Air Force Amendment Act of 27th November, 1947, constitutionally established the Women's Auxiliary Air Force as a part of the Royal New Zealand Air Force. The strength of the W.A.A.F. at the 31st March, 1948, was 130, which is the lowest figure since its inception in January, 1941.

Exchanges.—The system of exchanging officers with the Royal Air Force for a period of two years which commenced last year has proved most beneficial to the Royal New Zealand Air Force. The appointments of Deputy Chief of the Air Staff, Director of Technical Services, Director of Equipment, and one senior Station Commander are held by R.A.F. officers on exchange. As it was not possible for R.N.Z.A.F. officers, owing to the circumstances of their employment during the war, to obtain the training for these appointments, the presence of these experienced officers is most helpful, especially at this time. The R.N.Z.A.F. officers on exchange are employed in Transport and Coastal Commands at stores and maintenance depots and at the Empire Central Flying School. A total of 5 officers are on exchange. During the year 1 officer, A/Cdr. Wallingford, attended the Imperial Defence College, 2 officers attended the Joint Services Staff College, and 4 officers the R.A.F. Staff College.

Honours and Awards.—The honours and awards received by personnel of the R.N.Z.A.F. for the year, which includes a number of foreign awards for war service, are shown in Appendix B.

Casualties :—

	From 1st April, 1947, to 31st March, 1948.	
	In New Zealand.	Overseas.
Killed or presumed dead	..	6
Died of natural causes	1	..
Missing believed killed	..	..
Missing	..	..
	1	6

Of the 6 personnel killed overseas, 1 was accidently drowned, 1 was killed in a railway accident, and 1 is a war casualty now reclassified to "presumed dead," 2 were missing on Mosquito Ferry flight, and 1 was killed in the United Kingdom (aircraft accident).

Medical and Dental

The R.N.Z.A.F. Medical Service is faced, in addition to its responsibility for the general health of serving personnel, with many problems peculiar to aviation, and particularly Service flying. Only limited attention can be given at present, owing to lack of experienced staffs, to aviation medicine and psychology, and the medical aspects of high altitude flying, fatigue, and flying safety.

Depleted medical staffs assisted by civilian medical practitioners on a part-time basis provided medical treatment for serving personnel and Medical Boards for recruits and personnel being demobilized. In August, 1947, it was agreed that the Royal New Zealand Army Dental Corps should be responsible for the dental services for the Navy, Army, and Air Force, but, even with the assistance of civilian dentists, the complete maintenance of dental fitness of Air Force personnel was not possible due to the lack of Service dental officers.

Training

Flying Training.—The introduction of the new aircrew scheme involving a more comprehensive range of duties in aircrew trades necessitated recasting syllabi and procedures in training.

The major activity at Wigram, which contains the Flying Training School, Advanced Flying School, and Air Navigation School, has been in the preparation of instruction for forthcoming new aircrew intakes to the new standards. During the year a total of twenty-nine pilots passed out from instructors' and refreshers courses, together with 7 Army officers who each completed fifty hours *ab initio* flying training prior to their specialization in Army/Air co-operation duties. A.T.C. Cadets who commenced training under the Government-subsidized A.T.C. Flying Training Scheme were given flying checks by R.N.Z.A.F. instructors, and it appears that good aircrew material will be forthcoming from this source. The categorization of civilian pilots for Civil Instructors' Licences was also undertaken. The Air Navigation School continued with refresher and instructors' courses. Previously situated at Whenuapai, the Instrument Flying School moved to Wigram to be incorporated in the Advanced Flying School in November, 1947, and re-equipped with Oxford aircraft.

Technical Training.—Work has proceeded on the preparation of instructional syllabi and facilities following the introduction of the new trade structure. Training in all except administrative trades is now developing satisfactorily. Administrative trades are not attracting the required number of recruits. Since the educational standard of the average recruit has been inadequate, especially in certain subjects, it has been necessary to provide additional basic educational instruction not previously contemplated, before allowing recruits to pass to the technical training schools.

Non-regular Air Forces

The Non-regular Air Forces established by statute comprise the Territorial Air Force, the Air Force Reserve, and the Air Training Corps. The desirability of establishing the Territorial Air Force on an active basis and of reorganizing the Air Force Reserve as early as possible is fully recognized, as trained reserves are still an essential part of any fighting force. The efficient operation of Territorial squadrons, however, depends primarily on the strength and training of the Regular cadres maintained for their administration and instruction, and it will be some time before regular personnel can be made available for these duties. It is anticipated that the Territorial Air Force will be established and a measure of training activity commenced by the end of 1948.

The Air Training Corps has continued to give satisfactory service, although the training programmes this year were restricted by the poliomyelitis epidemic. The strength of the Corps on 30th November last, when A.T.C. squadrons and school units passed into recess for the season, was 5,253. The scheme of flying training for selected Cadets at aero clubs has proved a welcome incentive to service in the A.T.C. One hundred and thirty-nine Cadets have been selected and trained, of whom only 5 failed to complete their course.

Equipment

The period under review saw the implementation of the policy outlined in last year's report—viz., that of reverting to British aircraft and retaining only those American aircraft that were absolutely essential to fulfil current commitments. On 31st April, 1947, aircraft strength stood at 1,110. Since then 685 aircraft (mostly unserviceable American combat aircraft) have been disposed of in various ways, the sales through War Assets Realization Board and to aero clubs realizing £24,009 10s. Included in the above total, 14 Dakota aircraft and 4 Sunderland flying-boats and all spares, together with 50 per cent. of the total R.N.Z.A.F. holdings of C.47 spares, were transferred to N.Z.N.A.C. Of the remaining 535 aircraft, the Catalinas and Dakotas which have been retained surplus to establishment are being dismantled for spares and the 58 surplus Tiger Moths are held pending their transfer to the Royal New Zealand Aero Club, to whom they were presented by the Government in compensation for club aircraft appropriated during the war. The holdings of aero engines and engine and airframe

spares were considerably reduced following the disposal of the above aircraft. The Mosquito aircraft purchased from the R.A.F. last year will form suitable operational training equipment for squadrons during the interim period. The life of the other aircraft types (United States) remaining in the Service is strictly limited, and the commencement of a major rearming programme will be necessary about 1950. Already spares for all types are becoming increasingly difficult to obtain, as aircraft types held are now out of current production. Six new Auster airframes were purchased during the year, and when fitted with Gipsy Major Engines currently held in New Zealand these aircraft will be used for communications, fire patrol, and Army co-operation duties. Following a decision concerning the major reserve of bulk fuel to be held by the Service, thirty additional underground tanks were made available to the New Zealand Government Railways and the British Petroleum Co. of New Zealand, Ltd.

Acute man-power shortages in the equipment trades were again accentuated by the very considerable commitments involved in the segregation and disposal of surplus war equipment. The physical disposal of surplus tools, machinery, clothing, and metals proceeded, but generally the progress made has been insufficient to lessen the task when it is considered in proportion to the limited number of personnel available and the increasing importance of reconstituting the Air Force in accordance with the post-war plan. In short, the R.N.Z.A.F. is no longer able competently to handle in present detail the disposal of the remaining surplus and at the same time reconstitute its administrative activities in the equipment and accounting spheres which are fundamentally necessary to its successful re-establishment as a fighting Service. Discussions on this problem are being held with the War Assets Realization Board.

Technical Services

Following the example set by the R.A.F., the technical services of the R.N.Z.A.F. were reorganized to provide for their closer integration, particularly in view of the increasing importance of technical and scientific developments in air defence. A Directorate of Technical Services was established at Air Department to embrace all aspects of aeronautical engineering, technical training, and the technical aspect of signals and armament.

Engineering commitments could not all be covered and had to be dealt with on a priority basis to ensure that the standard of aircraft maintenance was kept at a high level.

No. 1 Repair Depot is being prepared for the overhaul of Mosquito aircraft. This repair depot will cover the overhaul of operational-type aircraft, while all training-type aircraft will pass through No. 2 Repair Depot to be established at Wigram. Because of the shortage of trained technical personnel, some maintenance work in support of priority flying commitments was contracted to civilian aircraft engineering companies during the year. The policy of the Air Force, however, is to carry out all normal maintenance within the Service except in the case of major repairs and modifications, which are not normally done by the Air Force.

During the year the R.N.Z.A.F. was relieved of the responsibility of operating the communication channels and radio aids to air navigation which are required for the control of both civil and Service aircraft on travel flights within New Zealand. The Civil Aviation Branch of Air Department has assumed this responsibility. Essential communications in the R.N.Z.A.F. were maintained at a reduced level. Land-line channels and teleprinter services were taken over by the Post and Telegraph Department and are now rented to the R.N.Z.A.F. This latter move has been in the interests of economy of operation and maintenance in peacetime.

Works Services

With the one exception of Wigram Aerodrome, all Air Force stations are occupied or used to varying degrees by civil aviation, which naturally introduces complex problems of joint control.

This policy is necessary by virtue of the economies arising from the joint use of the airfields and their facilities. It is practicable up to the point when conflicting Air Force and civil aviation interests and the increase of air traffic cause inconvenience to both, and delays in the flow of traffic.

It is essential that these factors should be thoroughly examined in the course of long-term planning for aviation in New Zealand. This applies particularly to the case of Whenuapai, Auckland, which aerodrome is the international airport as well as the city airport for Auckland, in addition to being the most important station in the Air Force.

The R.N.Z.A.F. facilities at Mechanics Bay, Auckland, and the Air Training Corps Camp at Paraparaumu have recently been closed and buildings declared surplus. All National Patriotic Fund Board buildings and equipment remaining on stations in New Zealand were purchased by the R.N.Z.A.F. They are now controlled by the Air Force and occupied by the Y.M.C.A. organization.

While the standard of public works maintenance has been high, there is considerable leeway in the form of modifications and improvements necessary to bring Service establishments up to acceptable peacetime standards. As part of a long-term rebuilding plan, three airmen's barrack blocks have now been transferred from Ardmore to Te Rapa.

With the exception of four houses at Woodbourne, no permanent married quarters have been erected on Air Force stations since 1939. This shortage of housing is detrimental both to recruiting and the retention in the Service of much-needed trained personnel. Some alleviation has been afforded by the conversion to temporary accommodation of surplus buildings, and to date thirty flats have been completed.

Organization

At the commencement of World War II the newly constituted R.N.Z.A.F. was in the process of being developed and expanded on the Cochrane Plan, which was approved by Parliament in December, 1936, in implementation of its policy on air defence. During the war developments in technical equipment and in administration dictated many organizational and technical changes in the future structure and administration of Air Forces. These matters have continued to be examined by a special Post-war Planning Committee, and changes are being incorporated where necessary. In the course of these changes, administrative orders and publications require almost complete revision. Work is proceeding on the compilation of a Manual of Air Force Orders and Regulations. The four thousand Air Department orders existing at the end of the war have been consolidated and reduced to approximately three hundred, and other categories of orders are being similarly reviewed. The object of this work is to produce an effective system of regulations and orders for the administration of the Air Force.

Education

The formation of the Education Branch of the R.N.Z.A.F., which is recognized as a "post-primary school" in terms of the Education Regulations and as a staffing commitment by the Education Department, will greatly strengthen the educational services within the Air Force. Adequate educational and vocational training staff and facilities are essential to the efficiency of the R.N.Z.A.F., and particularly to its element of short-service personnel.

Under the present system and terms of enlistment the R.N.Z.A.F. is not obtaining a satisfactory proportion of men of sound educational background. The present time-lag between the school leaving age and the age of recruitment allows the best potential tradesmen to enter civilian trades and become fairly settled before they are old enough to enlist in the Air Force. With the object of overcoming this difficulty, an apprentice scheme is under consideration.

Every encouragement is being given to serving personnel to improve themselves educationally for accepting higher responsibility. R.N.Z.A.F. scholarships have been introduced to enable selected candidates to complete a degree at one of the affiliated colleges of the University of New Zealand. The broader aspects of general education among serving personnel will be assured in the coaching of personnel for the recently approved compulsory Educational Promotion Examination.

The establishment of a sound and ample educational and vocational training scheme within the Service is one of the chief attractions to young New Zealanders of the basic calibre required, and it will be necessary to develop this organization still further both as an aid to recruiting and as a means of ensuring that airmen are in a position to undertake technical instruction.

Flying Accident Prevention

The Accidents Investigation Branch created during the war in the office of the Chief of the Air Staff is now established as the Flying Safety Organization on the staff of the Air Secretary. It is responsible to the Chief of the Air Staff for the investigation of particular flying accidents in the R.N.Z.A.F., the preparation of information on accident prevention, and for compiling accident statistics.

Station Accident Prevention Committees have been formed, and Station Accident Prevention Officers have been appointed on all R.N.Z.A.F. flying-stations. It is expected that these measures, together with flying safety bulletins, safety suggestions, and posters issued by the Flying Safety Organization, will engender a fuller understanding of the causes of aircraft accidents and result in a reduction in accident rates.

During the period under review there were 2 fatal accidents involving R.N.Z.A.F personnel; 1 occurred in England during conversion training to Mosquito aircraft, the other in a missing Mosquito aircraft which was being flown from England to New Zealand, the crew being now presumed dead. Two personnel were slightly injured when another Mosquito crashed during a flight from England, and a pilot was injured in Japan as the result of a landing accident. There was 1 serious accident during the 6,232 hours flying of the transport squadron operating the service to Japan, and this resulted in 3 being slightly injured when the aircraft was wrecked in the Philippine Islands. Apart from minor failures, this Service has been particularly free from incident.

These accidents were spread over a total flying-time of approximately 21,000 hours.

Public Relations

In addition to the routine public-relations activities carried out during the year approximately nine hundred and fifty next-of-kin were informed of the results of investigations carried out by the R.A.F. Missing Research and Inquiry Service. In most cases next-of-kin were supplied with the findings of the investigation, together with a report on the circumstances surrounding the last flight. Investigations on outstanding cases are still proceeding.

Historical Records

Narrative work on most aspects of the history of the R.N.Z.A.F. should be completed within twelve months, with the major exceptions of the narrative of the history of operations in the Pacific during 1944 and 1945 and the Fighter Command narrative, which are both handicapped by lack of staff. This work is directed by the Editor-in-Chief, New Zealand War Histories, and staff is provided by the R.N.Z.A.F.

Conclusion

This year has seen a marked advance primarily in the sphere of administration and organization in the development of the peacetime Air Force. The future efficiency of the Service will depend primarily upon the response to the recruiting programme in the way of adequate numbers of a high calibre.

I wish to express my thanks to all ranks of the Royal New Zealand Air Force, civilian staff of Air Department, and to the Departments with which the Air Force is closely associated for their services and assistance during the past year.

I have, &c.,

A. de T. Nevill, Air Vice-Marshal,
Chief of the Air Staff.

Appendix A—Flying Statistics for Year 1st April, 1947, to 31st March, 1948

	Flying-hours.
Operational Units—	
No. 14 (F) Squadron	3,032·45
No. 5 (FB) Squadron	993·50
No. 75 (BR) Squadron	785·15
Total	4,811·50
Transport Units—	
No. 41 Squadron	6,232·20
No. 40 Squadron	2,259·35
Sunderland Squadron	578·55
General Purpose Flight	2,273·10
Total	11,344·29

	Flying-hours.
Training—	
Air Navigation School	767·25
No. 1 Flying Training School	2,118·20
Instrument Flying School	607·45
Total	3,493·30
Miscellaneous—	
Canterbury Project Flight	419·05
Forestry Fire Patrol	78·50
Communication Flight (Rongotai)	50·15
Miscellaneous Station Flying	729·55
Total	1,278·05
Grand total	20,927·45

Appendix B—Honours and Awards

Honours

	Conferred 1st April, 1947, to 31st March, 1948.
Commander of the Order of the British Empire	1
Officer of the Order of the British Empire	3
Member of the Order of the British Empire	12
	16

Awards

	Conferred 1st April, 1947, to 31st March, 1948.
Air Force Cross	7
British Empire Medal	4
U.S. Legion of Merit	2
Croix de Guerre (French)	7
Legion of Merit (French)	1
Legion of Honour (French)	1
Chevalier of Order of Leopold	4
Netherlands Flying Cross	2
	28
Mentioned in Despatches	1
Commendations	10

Appendix C—Statistical Summary of R.N.Z.A.F. Air Transport Services (Overseas)

At 31st March, 1948, services were being operated by the R.N.Z.A.F. Air Transport over the following routes :—

(a) External Schedule Services

Route.	Route-miles.	Frequency.
C. 47 Services—		
Auckland–Japan (via Norfolk, Brisbane, Cloncurry, Darwin, Morotai, Manila, Okinawa, Iwakuni)	7,000	Once weekly.
Auckland–Norfolk	574	Once fortnightly.

Traffic statistics for these routes for the year ended 31st March, 1948, were :—

Period.	Hours Flown.	Ton/miles Capacity Created.	Ton/miles Capacity. Used.	Load Factor.
1947				
April–June	1,361	416,000	307,454	75·4
July–September	747	208,000	164,326	80·1
October–December	948	267,000	223,126	84·0
1948				
January–March	864	26,000	205,803	77·0
Totals	3,920	917,000	900,709	79·1

Period.	Passenger-miles.	Passenger Ton/miles.	Freight Ton/miles.	Mail Ton/miles.
1947				
April–June	1,279,974	159,874	29,637	17,943
July–September	599,536	73,004	26,088	65,233
October–December	1,298,888	164,092	34,004	25,030
1948				
January–March	1,156,023	145,186	40,709	19,907
Totals	4,334,421	542,156	130,438	128,113

(b) Internal and Regional Services Operated by the R.N.Z.A.F. on Behalf of National Airways (Includes Sunderland Service)

Period from 1st April, 1947, until actual hand over to New Zealand National Airways Corporation on 31st May, 1947 (internal), and 1st November, 1947 (Regional)

Passengers carried	28,760	Passenger miles	8,435,121
Hours flown	2,259·55	Passengers, in ton/miles	986,341
Ton/miles capacity created ..	1,340,000	Freight, in ton/miles	28,221
Ton/miles capacity used	1,105,421	Mail, in ton/miles	5,031
Load factor	81·1		

(c) Statistics for Whole Period of Japan Courier Service

Since the inaugural flight made in March, 1946, to the termination in April, 1948, statistics for the routine schedule are as under :—

Number of flights	104
Miles flown	1,323,872
Hours flown	8,804
Passengers carried	1,477
Weight of mail carried (lb.)	248,711
Weight of freight carried (lb.)	114,420
Weight of passengers carried (lb.)	356,245

In addition to carrying out the above schedule, No. 41 Squadron made a number of special flights to Japan with Senior Government and Service Officials and with urgent freight.

REPORT OF THE DIRECTOR OF CIVIL AVIATION FOR THE YEAR ENDED 31st MARCH, 1948

The Hon. the MINISTER OF DEFENCE.

I HAVE the honour to submit the following report on civil aviation for the year ended 31st March, 1948.

SECTION I.—ADMINISTRATION

1. ORGANIZATION

During the twelve months ended 31st March, 1948, the staff of the Civil Aviation Branch has increased from 192 to 383—almost exactly double. This increase has been due in the main to the following factors :—

(*a*) The rapid expansion of internal air services.

(*b*) Additional aerodromes being placed on an operational basis and requiring the provision of communications and control staff. On existing aerodromes, moreover, expanding operations require increased services. Under this heading comes the temporary transfer of flying operations from Rongotai to Paraparaumu.

(*c*) The general expansion of aircraft operation involves a related expansion of the inspection service, which carries the important responsibility of ensuring the airworthiness of aircraft, the supervision of materials from their origin to their incorporation in aircraft, daily maintenance, and licensing and supervision of the personnel engaged in this work.

(*d*) Increase in the technical and administrative staff required at Nadi, since this base is now an important staging-post in the Pacific services.

(*e*) The almost entire assumption of functions and services formerly provided by the Post and Telegraph Department and the R.N.Z.A.F. as regards communications and air traffic control.

(*f*) The generally increased responsibilities in New Zealand's sphere of influence in the Pacific.

(*g*) The growing requirement for modern navigational aids.

This total of 383 includes 68 located in the Pacific islands, while 315 are stationed within New Zealand at some twenty-seven localities.

New Zealand is experiencing a shortage of qualified technical officers, and it must therefore be expected that the growth of the branch will continue as suitable appointees become available.

With the appointment on 1st May, 1948, of Mr. I. A. Scott, O.B.E., A.M.I.E.E., A.F.R.Ae.S., A.M.N.Z.I.E., as Deputy Director of Civil Aviation, it was possible to advance further with the structural organization of the branch, which is now broadly organized into the following Divisions :—

(*a*) Division of the Director of Civil Aviation.

(*b*) Aeronautics Division.

(*c*) Air Navigation Division.

(*d*) Airways Division, including airport engineering, air-traffic control, operations, and telecommunications sections.

(*e*) Clerical Services Division, dealing with the clerical aspect of airworthiness and aircraft registration, licensing, and general clerical services for all divisions. During the year some 112,000 notices were issued, representing Notices to Airmen, Notices to Aircraft Owners and Engineers, Operations Instructions, and a variety of statistical returns.

2. General

In April and May, Messrs. S. R. Meatchem and F. T. Young represented New Zealand at the second meeting of the Commonwealth Air Transport Council and the First Assembly of the International Civil Aviation Organization, both of which were held in Montreal.

The Commonwealth Air Transport Council met between 30th April and 5th May to consider the Commonwealth views on matters of general interest relating to international air transport, the arrangements for the regional investigation of accidents, sanitary measures, and ground organization of Commonwealth air routes. Consideration was also given to the policy to be adopted in regard to the classification of scheduled services and the continuation of the Empire air-mail scheme.

The First Assembly of ICAO was held between 6th and 27th May and was the first meeting of the permanent organization established as a result of the International Civil Aviation Conference held in Chicago in November and December, 1944. While it was not expected that general agreement would be reached on a number of major points, many important decisions were made and a considerable degree of uniformity is resulting in aviation practices and procedures. The operation of ICAO is a continuing one, and exchanges of information on matters of vital concern to aviation require careful consideration and research.

Mr. J. J. W. B. Joyce, Chief Surveyor, Aeronautics Division, visited the United Kingdom during the period August to December, 1947, for the purpose of investigating and reporting on the aircraft-inspection procedures carried out by the Air Registration Board. The opportunity was also taken to inspect at first hand the main aircraft-manufacturing companies.

3. International Air Services

During the year arrangements were practically completed for the transfer of the Pacific air services, conducted in the meantime by Australian National Airways, Ltd., to British Commonwealth Pacific Airlines, Ltd.

With effect from 29th December, 1947, the agreement dated 25th November, 1935, between the New Zealand Government and Pan-American Airways was allowed to expire. This agreement had covered the operation of an air service by the company between the United States and New Zealand. From December, 1947, the operations of Pan-American Airways became subject to the Air Transport Agreement dated 3rd December, 1946, between the Governments of the United States of America and New Zealand.

On 23rd February, 1948, the limited transport facilities between New Zealand and Australia were still further reduced by the temporary suspension of the operations of Tasman Empire Airways, Ltd., following instances of over-heating of the engines. Modifications and tests on these aircraft are being carried out as rapidly as possible to permit their early return to service.

4. Legislation

In September, 1947, New Zealand signed a Protocol of amendment of the Convention on International Civil Aviation executed at Chicago on 7th December, 1944. This Protocol amended Article 93 and provided for collaboration between the General Assembly of the United Nations and ICAO on the question of admittance to membership. The effect of this amendment is that a State which ceases to be a member or is expelled from one Organization shall automatically cease to be a member of the other Organization unless special approval is given. The Protocol is subject to ratification by at least twenty-eight Member States of ICAO.

No amendments to the Air Navigation Act, 1931, or to Air Navigation Regulations 1933 were made during the year, but a Civil Aviation Bill to replace the former is now required in order to give effect to the Chicago Convention. It is anticipated that this Bill will be introduced during 1948.

Air Navigation Directions were issued under authority of the Minister of Defence in December, 1947, and March, 1948, respectively, to give effect to ICAO procedures which required immediate implementation.

A.N.D. 5 introduced comprehensive rules of the air under some nine headings, such as, for example, visual flight rules, instrument flight rules, aerodrome rules for night lighting, &c. In addition, rules for air traffic control were included, together with rules for search and rescue operations.

A.N.D. 6 introduced instrument ratings, which, briefly, require pilots to hold specified ratings issued by the Director of Civil Aviation before an aircraft may be piloted solely by reference to instruments and without external reference points.

SECTION II.—AIR TRANSPORT OPERATIONS

During the year ended 31st March, 1948, there were further changes in the operation of internal air transport services when the New Zealand National Airways Corporation assumed responsibility on 1st October, 1947, for the services operated by Air Travel (N.Z.), Ltd., and on 2nd June, 1947, for all civil operations carried out by the R.N.Z.A.F. The latter included the operation of the inter-Island freight service on behalf of the New Zealand Railways established following a series of special inter-Island air freighting flights operated last year in order to meet a shipping emergency. After these changes were effected, New Zealand National Airways Corporation became the sole operator of scheduled commercial services within New Zealand.

In addition, on 1st November, 1947, the Corporation commenced operating services in the South-west Pacific, which were previously operated by the R.N.Z.A.F. on a quasi-civil basis.

(*a*) Internal Scheduled Services

At 31st March, 1948, services were being operated by New Zealand National Airways Corporation over the following routes :—

Route No.	Route.	Route Miles.	Frequency.
1	Auckland–Dunedin (via Palmerston North, Wellington, and Christchurch	704	Twice daily in each direction, plus one daily return trip Palmerston North-Dunedin, plus one daily return trip Auckland–Wellington.
2	Dunedin–Invercargill	107	Thrice daily in each direction.
3	Nelson–Wellington–Blenheim ..	167	Wellington–Blenheim, five trips daily in each direction ; Wellington–Nelson, five trips daily in each direction.
4	Auckland–Wellington (via New Plymouth and Palmerston North)	316	Once daily in each direction.
5	Auckland–Gisborne (via Tauranga) ..	211	Once daily in each direction.
6	Auckland–Gisborne	209	Once daily in each direction.
7	Gisborne–Wellington (via Napier and Palmerston North)	226	Once daily in each direction.
8	Auckland–Kaitaia (via Whangarei and Kaikohe)	165	Once daily in each direction.
9	Auckland–Christchurch (via Wellington)	505	Once daily in each direction.
10	Auckland–Christchurch	479	Once daily in each direction.
11	Wellington–Hokitika (via Nelson and Westport)	266	Wellington–Westport, once daily in each direction ; Westport–Hokitika, once daily in each direction.
12	Hokitika–Okuru (via Waiho and Haast)	135	Thrice weekly in each direction.
	Total route miles	3,490	

No services operated on Sundays.

Traffic statistics for these routes for the year ended 31st March, 1948, were—

Route No.	Route.	Hours flown.	Miles flown.	Passenger-miles created.	Passenger-miles used.	Percentage of Seat Utilization.	Passenger Ton-miles.	Baggage Ton-miles.
1	Auckland–Dunedin ..	6,791	1,065,555	15,995,715	13,972,310	87	973,346	156,425
2	Dunedin–Invercargill ..	1,021	110,362	1,038,040	669,531	64	48,259	6,393
3	Nelson–Wellington–Blenheim	5,882	538,908	3,238,909	2,738,091	85	196,518	29,671
4	Auckland–Wellington ..	1,702	209,118	2,095,159	1,803,392	89	134,709	21,576
5	Auckland–Gisborne ..	1,118	132,710	1,327,100	1,128,196	83	71,620	11,763
6	Auckland–Gisborne ..	1,029	134,805	1,354,320	1,228,502	91	82,805	14,227
7	Gisborne–Wellington ..	1,355	155,546	1,566,085	1,376,417	88	94,991	15,486
8	Auckland–Kaitaia ..	986	102,292	1,018,120	843,574	83	53,492	8,152
9	Auckland–Christchurch ..	2,628	353,147	8,037,012	6,061,834	75	465,665	61,092
10	Auckland–Christchurch ..	2,157	300,934	6,607,355	5,192,839	79	400,205	55,768
11	Wellington–Hokitika ..	1,353	149,818	*742,454	597,951	..	37,004	5,908
12	Hokitika–Okuru ..	713	67,797	*117,360	82,648	..	3,154	479
	Totals	26,735	3,320,992	43,137,629	35,695,285	..	2,561,768	386,940

Route No.	Route.	Excess Baggage Ton-miles.	Freight Ton-miles.	Mail Ton-miles	Total Ton-miles created.	Total Ton-miles used.	Percentage of Aircraft Utilization.
1	Auckland–Dunedin	13,554	40,563	60,010	1,673,183	1,243,898	74
2	Dunedin–Invercargill	347	807	1,246	88,437	57,052	65
3	Nelson–Wellington–Blenheim ..	2,187	12,368	1,925	351,546	242,627	69
4	Auckland–Wellington	1,590	3,015	4,151	236,007	165,041	70
5	Auckland–Gisborne	1,060	1,317	960	129,840	86,720	67
6	Auckland–Gisborne	1,359	5,154	332	136,068	103,877	76
7	Gisborne–Wellington	1,608	2,380	3,031	170,813	117,495	69
8	Auckland–Kaitaia	578	497	852	101,161	63,571	63
9	Auckland–Christchurch	5,604	11,018	9,986	891,881	553,364	62
10	Auckland–Christchurch	5,941	9,848	10,785	636,878	482,547	76
11	Wellington–Hokitika	513	2,304	1,782	79,563*	46,406	..
12	Hokitika–Okuru	100	2,298	2,250	9,713*	5,995	..
	Totals	34,441	91,569	97,310	4,505,090	3,168,593	..

* Figures not available for period 1st April, 1947, to 30th September, 1947.

During the year ended 31st March, 1948, 154,329 passengers, 1,211,345 lb. of freight, and 597,231 lb. of mail were carried on these services.

Aircraft used in the operation of services on these routes were—

Lockheed Lodestar	7
Lockheed Electra	5
Douglas D.C. 3	7
Douglas C. 47c (freighter)	5
D.H. 89B Dominie	6
D.H. 89A Rapide	1
D.H. 83 Fox Moth	2
Total	33

This represents an increase of fifteen over the total number of aircraft operated by New Zealand National Airways Corporation and Air Travel (N.Z.), Ltd., during the year ended 31st March, 1947.

The following services previously operated by the R.N.Z.A.F. Air Transport were taken over by New Zealand National Airways Corporation on 2nd June, 1947 :—

Auckland–Wellington–Christchurch.
Auckland–Christchurch.

When the three services operated by Air Travel (N.Z.), Ltd.—namely, Hokitika–Nelson (via Greymouth and Westport), Hokitika–Weheka (via Waiho), and Hokitika–Okuru (via Haast)—were taken over by New Zealand National Airways Corporation they were replaced by two services operating over the following routes :—

Wellington–Hokitika (Nelson and Westport).
Hokitika–Okuru (via Waiho and Haast).

The following is a summary of scheduled traffic statistics for all services for the years 1935–48 :—

Year ended,	Hours flown.	Miles flown.	Passengers.	Freight.	Mail.	Passenger-miles.	Freight Ton-miles.	Mail Ton-miles.
				lb.	lb.			
31st March, 1935 ..	315	31,500	595	2,637	1,841	10,000	120	75
31st March, 1936 ..	3,220	346,171	9,106	26,123	19,431	860,295	1,758	957
31st March, 1937 ..	6,588	776,938	24,251	44,074	111,377	2,673,860	2,047	9,288
31st March, 1938 ..	11,327	1,331,100	43,782	81,853	216,238	5,518,363	4,301	18,205
31st March, 1939 ..	12,821	1,574,395	53,039	166,278	316,380	6,787,026	9,054	29,248
31st March, 1940 ..	10,541	1,326,234	51,802	223,018	234,989	6,478,540	12,247	21,729
31st March, 1941 ..	5,036	645,702	37,023	206,936	130,806	4,573,822	9,585	12,555
31st March, 1942 ..	5,206	688,723	38,058	194,858	165,670	5,062,938	9,434	17,616
31st March, 1943 ..	5,576	685,953	30,634	174,757	220,527	4,655,774	9,423	23,887
31st March, 1944 ..	6,421	832,966	37,435	191,113	244,614	6,371,007	11,426	29,677
31st March, 1945 ..	7,129	965,787	51,754	272,251	313,013	9,299,979	18,824	44,040
31st March, 1946 ..	8,541	1,108,134	60,193	338,950	428,709	10,158,221	22,587	52,935
31st March, 1947 ..	16,443	1,502,494	140,268	634,495*	605,086*	32,642,202	90,471†	85,387†
31st March, 1948 ..	26,735	3,320,992	154,329	1,211,345	597,231	35,695,285	126,010	97,310

* Does not include freight or mail carried by R.N.Z.A.F. Air Transport. † Includes freight ton-miles and mail ton-miles by R.N.Z.A.F.

The following licences were held at 31st March, 1948, by New Zealand National Airways Corporation staff :—

"B" Licence	96
Navigator's Licence—	
First Class	3
Second Class	24
Radio Telegraph Operator's Licence—	
First Class	11
Second Class	2
Third Class	75
Temporary	13
Radio Telephone Operator's Licence	6
Flying Instructor's Authority	12
Aircraft Engineer's Licence	72

(*b*) Internal Non-scheduled Services

The following is a traffic summary of non-scheduled services for the year ended 31st March, 1948 :—

Trips	3,174
Hours flown	2,034
Miles flown	234,653
Passengers	3,199
Freight (lb.)	13,254,190
Freight ton-miles	448,891

This summary includes the statistics of the air freight service between Paraparaumu and Woodbourne operated by New Zealand National Airways Corporation on behalf of the New Zealand Railways. Traffic statistics for this service for the year ended 31st March, 1948, were—

Trips	1,786
Hours flown	1,114
Miles flown	138,266
Freight (lb.)	13,081,232
Freight ton-miles	448,891

A total of five Douglas C. 47c aircraft were used on the inter-Island freight service, and the remaining traffic was served by the following aircraft :—

Douglas D.C. 3	D.H. 83 Fox Moth.
Douglas C. 47c.	De Soutter.
Lockheed Lodestar.	Waco
Lockheed Electra.	Monospar S.T. 25.
D.H. 89A Rapide.	Beechcraft A.T. 11.

(c) External Scheduled Services

(i) *Tasman Empire Airways, Ltd.*

During the year ended 31st March, 1948, the two Short S. 30 flying-boats operated by Tasman Empire Airways, Ltd., were withdrawn from service and an aircraft of the Short S. 25 type was acquired, bringing the total fleet operated by this company to four Short S. 25 flying-boats. During November the frequency was increased to eight trips weekly in each direction.

On 22nd February, 1948, the Short S. 25 aircraft operated by Tasman Empire Airways, Ltd., were grounded as a result of engine-cooling troubles. As from 23rd February, 1948, this service was operated by other airlines under charter to Tasman Empire Airways, Ltd.

Route details are as follows :—

Route	Auckland–Sydney.
Route miles	1,340

Traffic statistics for the year ended 31st March, 1948, were—

Hours flown	6,128
Miles flown	991,916
Passengers	18,792
Freight (lb.)	223,229
Mail (lb.)	331,926
Passenger-miles created	26,504,948
Passenger-miles used	25,194,933
Percentage of seat utilization (per cent.)	95
Passenger ton-miles	2,364,653
Excess baggage ton-miles	22,349
Freight ton-miles	100,157
Mail ton-miles	198,556
Total ton-miles created	3,045,634
Total ton-miles used	2,704,351
Percentage of aircraft utilization (per cent.)	89

This includes those flights which were carried out by other companies under charter to Tasman Empire Airways, Ltd., during the period 23rd February to 31st March, 1948.

The following is a summary of traffic statistics for Tasman Empire Airways, Ltd., for the years 1941–48 :—

Year ended,	Hours flown.	Miles flown.	Passengers.	Freight.	Mail.	Passenger-miles.	Freight Ton-miles.	Mail Ton-miles.
				lb.	lb.			
31st March, 1941 ..	1,181	174,200	1,507	18,800	78,179	2,019,380	11,246	46,768
31st March, 1942 ..	1,382	211,920	1,959	32,230	167,275	2,625,060	19,280	100,066
31st March, 1943 ..	1,265	192,960	2,256	35,195	101,741	3,023,040	21,054	60,863
31st March, 1944 ..	1,502	229,140	2,924	40,024	94,106	3,918,160	23,943	56,296
31st March, 1945 ..	2,798	427,460	5,803	84,189	142,812	7,796,020	50,363	85,432
31st March, 1946 ..	3,270	293,764	6,100	99,584	214,792	8,174,000	60,019	128,492
31st March, 1947 ..	4,863	778,704	11,648	176,687	278,789	15,608,320	105,697	166,776
31st March, 1948 ..	6,128	991,916	18,792	223,229	331,926	25,194,933	122,506	198,556

Licences held by the company's staff as at 31st March, 1948, were—

" B " Licence	28
Navigator's Licence—	
First Class	23
Second Class	2
Radio Telegraph Operator's Licence—	
First Class	11
Third Class	2
Flying Instructor's Authority	6
Aircraft Engineer's Licence	72

(ii) *New Zealand National Airways Corporation*

New Zealand National Airways Corporation commenced operating services in the South-west Pacific on 1st November, 1947, over the following routes :—

Route No.	Route.	Route Miles.	Frequency.
1	Auckland–Lambasa (via Suva) ..	1,458	Once weekly in each direction.
2	Auckland – Norfolk Island	661	Once weekly in each direction.
3	Auckland–Rarotonga (via Norfolk Island, Nandi, Nausori, Tonga, Apia, and Aitutaki)	3,820	Once fortnightly in each direction.
	Total route miles	5,939	

The Auckland - Norfolk Island service was suspended on 15th December, 1947, due to the poliomyelitis epidemic in New Zealand, and the Auckland–Lambasa service was suspended on 16th February, 1948, due to unserviceable aircraft.

Traffic statistics for these routes for the period 1st November, 1947, to 31st March, 1948, were—

Service.	Auckland–Lambasa.	Auckland–Norfolk Island.	Auckland–Rarotonga.	Total.
Hours flown	306	61	515	882
Miles flown	46,096	9,254	77,696	133,046
Passengers	1,104	142	1,227	2,473
Freight (lb.)	4,439	236	25,472	30,147
Mail (lb.)	6,559	201	10,097	16,857
Passenger-miles created	1,198,496	175,826	1,476,224	2,850,546
Passenger-miles used	864,894	93,862	540,753	1,499,509
Percentage of seat utilization (per cent.)	72	53	36	53
Passenger ton-miles	75,146	8,692	44,277	128,115
Excess baggage ton-miles	1,298	211	381	1,890
Freight ton-miles	2,191	70	4,847	7,108
Mail ton-miles	3,582	59	2,224	5,865
Total ton-miles created	121,611	12,533	82,259	216,403
Total ton-miles used	82,217	9,032	51,729	142,978
Percentage of aircraft utilization (per cent.)	67	72	63	66

Aircraft employed on these services were three Douglas (D.C. 3) aircraft and one Short Sunderland flying-boat.

(iii) *Pan-American Airways, Inc. (U.S.A.)*

Pan-American Airways, Inc., continued to operate its service between San Francisco and Auckland (via Honolulu, Canton Island, and Nandi) with D.C. 4 (Skymaster) aircraft. The frequency was increased to one return trip per week during the year.

Traffic to and from New Zealand for the year ended 31st March, 1948, was—

Hours flown	4,290
Miles flown	859,044
Traffic entering New Zealand—	
Passengers	1,565
Freight (lb.)	44,720
Mail (lb.)	14,842
Traffic leaving New Zealand—	
Passengers	758
Freight (lb.)	21,851
Mail (lb.)	4,013

(iv) *British Commonwealth Pacific Airlines*

A new service, Vancouver–Auckland (via San Francisco, Honolulu, Canton Island, and Nandi) was inaugurated during April, 1947, and was operated under contract by Australian National Airways Pty., Ltd. Skymaster (D.C. 4) aircraft were used on this service and the frequency was one return trip per fortnight.

Traffic to and from New Zealand for the year ended 31st March, was—

Hours flown	1,917
Miles flown	378,609
Traffic entering New Zealand—	
Passengers	742
Freight (lb.)	47,317
Mail (lb.)	3,030
Traffic leaving New Zealand—	
Passengers	232
Freight (lb.)	16,982
Mail (lb.)	8,192

(*d*) External Non-scheduled Services

The following is a summary of non-scheduled services for Tasman Empire Airways, Ltd., for the year ended 31st March, 1948. With the exception of those figures in parentheses, these operations were carried out by other companies under charter to Tasman Empire Airways, Ltd. :—

Trips	16	(2)
Hours flown	94*	(16)
Miles flown	21,664	(2,640)
Passengers	568	(55)
Freight (lb.)	10,913	(432)

* Partially calculated.

Aircraft employed on these services were—

Short Sunderland (S. 25).	Constellation.
Skymaster (D.C. 4).	

SECTION III.—AERO CLUBS

During the year four additional clubs commenced activities, bringing the number operating at 31st March, 1948, up to twenty-two.

The operations of these organizations during the year may be summarized as follows :—

(*a*) *Training*

Aircraft in use	101
Pupils under instruction at 31st March, 1948	647
Hours flown	26,592
Membership—	
Associate	2,868
Flying	2,728

(*b*) *Commercial*

Hours flown	3,459
Miles flown	348,711
Number of trips	6,721
Passengers carried	11,819

The types of aircraft used by the clubs are—

D.H. 82 Tiger Moth.	D.H. C. 1 Chipmunk.
Percival Proctor.	D.H. 83c Fox Moth.
Rearwin.	D.H. 90.
Miles Whitney Straight.	D.H. 94.
Miles Magister.	Percival Vega Gull.
Miles Gemini.	Taylor Cub.
Auster.	Waco.
Beechcraft.	

SECTION IV.—AERADIO SERVICES

At the end of July, 1947, the majority of the executive positions in the Telecommunications Section of the Airways Division were filled, many of the officers appointed having held similar positions in the R.N.Z.A.F. The staffing of this section coincided with a substantial increase in commercial airline activities and with the introduction of many new features in civil aviation telecommunications. This was fortunate in some respects, but presented many problems, due to the urgent need for communications

and navigational aid facilities over a wide area being manifest simultaneously with the consolidation and internal organization of a relatively new section of the Air Department.

The radio engineering section of the telecommunications organization has assumed full responsibility for the maintenance of all radio aids to navigation and radio communication equipment, and for the supervision of any new installations. In view of the rapid technical advances in aviation radio, the work of this section is becoming more and more specialized and complex.

Communication procedures for air navigation services as prescribed by the International Civil Aviation Organization were introduced for general use on internal and overseas aeradio circuits on 1st January, 1948. Although these procedures represent a departure from normal commercial routines, they were readily assimilated by aeradio operating staffs. Few modifications were necessary to adapt the procedures for national use, in spite of the fact that they are basically international. As a result there will be a high degree of standardization throughout the whole aeradio system, both internally and overseas.

The inauguration of new air services to Kaitaia and the extension of existing services to Invercargill called for new aeradio stations at Onerahi and Invercargill respectively. Both stations are in operation, although at Invercargill the installation is of a temporary nature pending the construction of more permanent buildings.

Aeradio facilities were installed at Paraparaumu and were brought into operation on 29th September, 1947, consequent upon the closing of Rongotai and the transfer of commercial air services to Paraparaumu. This is the only aerodrome in the Dominion where the operational facilities, although housed in temporary buildings, approach the ideal in layout—namely, aeradio, air traffic control, meteorological services, and company operations located in close proximity to one another in the same building. The communications facilities at Paraparaumu comprise teletype and telephone circuits at present, but will later be extended to include ground-to-air and point-to-point radio circuits.

Reconstruction work and installation work at various stations is being undertaken, but man-power and equipment shortages have seriously retarded progress.

Clearance has been obtained for several new frequencies for the high-frequency point-to-point radio circuits, and the installation of appropriate equipment to bring the new channels into operation will assist materially to relieve the present congestion and resultant delays to traffic.

Initial problems associated with the aeradio station at Nandi, Fiji, have been solved and the station is now functioning satisfactorily. One of the largest in the South Pacific, this station is favourably commented upon by overseas airlines. Progress with permanent accommodation for personnel at the airport has been held up pending a decision of the siting of the international airport for Fiji.

Certain aeradio stations continue to be administered by the Post and Telegraph Department where services other than aeronautical are provided. The facilities at Samoa are jointly controlled by both Departments, but in view of the distance between the aerodrome at Faleolo and the aeradio station at Apia it has been decided to install an independent aeradio station at Faleolo.

Negotiations for the acceptance of responsibility for Norfolk Island aeradio services by the Australian authorities have been completed, but implementation of the change of control has been delayed owing to the poliomyelitis restrictions in the Dominion preventing officials from visiting Norfolk to complete the transfer.

A training scheme for radio operators has been inaugurated and a limited number of cadets will be accepted to undergo a course of training at the R.N.Z.A.F. Electrical and Wireless School at Wigram early in June, 1948. The availability of junior operators will ease staffing problems, since the source of trained operators to fill existing and proposed establishments is now practically exhausted.

Radio Licensing and Airworthiness

Full responsibility for airborne radio and aircraft licensing was assumed by the Airways Division on 1st September, 1947. For the period ending 31st March, 1948, thirty aircraft were inspected for renewal or issue of Certificates of Airworthiness and radio failures totalled fifty-five. The New Zealand Civil Airworthiness Radio Requirements were compiled and have now been promulgated to all concerned.

Eleven applicants were examined for Aircraft Engineers' Licences, and of this number eight were successful.

Radio Aids to Navigation

Good progress has been made with the radio range installations at Christchurch, Wellington, and New Plymouth. The Christchurch and New Plymouth installations have been completed, and although some trouble has been experienced with the Porirua site at Wellington, that installation is sufficiently far advanced to be expected to serve as a vital link in the main trunk route on the introduction of Instrument Flight Rules.

The fan markers associated with the radio ranges at Auckland and Christchurch have been installed, but certain difficulties remain to be overcome in their radio performance. A site has been chosen for the fan marker for the New Plymouth range, and installation work will be commenced shortly.

The high-powered radio homing beacons ordered last year have now arrived in New Zealand, and preliminary survey work has been commenced in connection with their permanent installation and the erection of the 180 ft. steel towers associated with them. In the meantime it is proposed to install temporarily a certain number of the beacon transmitters in existing aeradio stations or, where this is not desirable due to site considerations, in temporary buildings of the military-hut type, to enable the provision of adequate radio navigational aid coverage at the earliest possible date.

A low-powered radio homing beacon is being installed in the new Kaikoura Aeradio Station, which will be opened for service shortly in conjunction with the introduction of Instrument Flight Rules. This station will fill a vital need for air traffic control purposes on the southern leg of the main trunk route.

The medium-frequency direction-finding stations continue to function, but are now little used. It is proposed to close these installations down when adequate homing beacon coverage is provided and ground-air communications are changed to high-frequency channels.

The New Zealand high-frequency direction-finding stations are in good order and continue to provide valuable assistance to aircraft on the Trans-Tasman and South Pacific regional routes. Preliminary work has commenced on the installation of a high-frequency direction-finder at Nandi in Fiji.

Equipment

Progress has been made with the setting-up of the maintenance organization required to enable the Civil Aviation Branch to discharge its responsibility for the efficient servicing of aeradio equipment. The Ministry of Works stores system has been adopted in principle, and the provision of essential workshop facilities has been planned and authorized.

Despite the lack of adequate facilities, work has proceeded on the reconditioning of war surplus radio equipment, and this will be considerably accelerated next year when the workshop facilities materialize.

All the equipment in Fiji and much of that in New Zealand is of American origin, and considerable attention has been given to the possibility of obtaining suitable spares and consumable items from the sterling area.

The responsibility for the field maintenance of the stations situated in the South Pacific islands has been based upon Nandi as a sub-centre, although every effort is being made to keep the absolute minimum of staff in the tropics, and to maintain the standard of efficiency rather by the supply of ample spare equipment than by technical services.

SECTION V.—AERODROMES AND RELATED GROUND FACILITIES

The considerable expansion of civil aviation activities, both in respect of commercial services and of club flying, has served to emphasize the need for the further development of many airfields and for the provision of additional ground aids. The most immediate and pressing needs have been met, but the Government's plans have been seriously restricted by the limited man-power and materials available.

Early in the year the Government set up the Aerodromes Committee, whose primary function is to prepare a fully co-ordinated plan for the development of airfields in New Zealand. The investigations of the Committee involve a large amount of research work, and, wherever possible, it is intended to conform to the standards recommended by the International Civil Aviation Organization. The members of the Committee include Sir Leonard Isitt (Chairman), the Commissioner of Works, the Chief of the Air Staff, the Deputy Chief of the Air Staff, the Air Secretary, and the Director of Civil Aviation. Representatives of the Ministry of Works, Treasury, and Air Department are co-opted as necessary to supply specialist assistance.

One of the major problems faced by the Aerodromes Committee during the year was the consideration of the airport requirements of Wellington City. After an exhaustive examination of many proposals and reports, the Government adopted the Committee's recommendation that, with certain minor amendments, the scheme prepared by the City Engineer be accepted.

Pending the reconstruction of Rongotai Aerodrome, it was necessary in the interests of safety to transfer commercial services to Paraparaumu. Certain building and runway-sealing works necessitated at Paraparaumu by the transfer were rapidly executed by the Ministry of Works.

General Development Work

With the exception of new airfield-construction work at Hokitika, at present progressing favourably despite serious drainage problems, the work carried out during the year has been largely maintenance. Improved operation facilities have, however, been provided at several airfields, while at Napier and Waitaki strip extensions are in hand.

On account of the limitations of many airfields, detailed consideration is being given to the formation of strips approaching 5,000 ft. long and 500 ft. wide on the more important aerodromes. In addition, new sites are being investigated in the vicinity of Auckland, Rotorua, and Timaru.

Night Flying Facilities

Preliminary work is in hand for the installation of aerodrome lighting at the Paraparaumu, Woodbourne, and Harewood Aerodromes, whilst at Whenuapai and Ohakea steps are being taken to improve existing night flying facilities.

Housing Construction

With the increasing demand for aerodrome flying control and communications personnel at many localities throughout New Zealand and the South Pacific has grown the need for a co-ordinated scheme for the provision of flats or houses. This requirement must be treated as a departmental responsibility, due to the fact that in many cases comparatively isolated localities are involved, while, in addition, the regular rotation of personnel between the South Pacific and New Zealand stations is a most desirable objective.

Airports for Overseas Services

The R.N.Z.A.F. Station at Whenuapai continues to be utilized as the interim overseas airport, and is the only designated regular Customs airport and airport of entry into New Zealand for land-based aircraft operating on international services. In

addition, it continues to serve its normal R.N.Z.A.F. functions. Beyond the improvement of temporary buildings for airport functional purposes in handling passengers, no developments of importance have been undertaken.

The flying-boat base at Mechanics Bay, Auckland, continues to serve a similar function for marine craft.

Pacific Aerodromes

The New Zealand National Airways Corporation regional Pacific air services have operated through Nandi and Nausori Aerodromes (Fiji), Faleolo Aerodrome (British Samoa), Aitutaki and Rarotonga Aerodromes (Cook Group), and Fua'A'Motu Aerodrome in Tonga. Each of these aerodromes is under the administration of Air Department, with the New Zealand Ministry of Works undertaking the work of maintenance and improvement to civil standards. No major works have been undertaken, and work has been confined to converting wartime temporary Service facilities to conform to civil requirements.

At the Nandi International Airport in Fiji New Zealand, on behalf of the other interested British Commonwealth Governments, has continued to discharge the full responsibilities for administration, operation, maintenance, and development, as accepted at the Civil Aviation Conference of March, 1946. Work beyond essential maintenance has been confined to conversion of temporary service facilities to minimum requirements, to enable the airport to function as a civil airport. These facilities, including staff accommodation, are of a temporary nature until the location of the permanent airport for Fiji is finalized.

During the past year a British Commonwealth Commission was set up to determine the final location for the international airport in Fiji. The Commission has concluded its deliberations, but has yet to release its recommendations.

SECTION VI.—AIRCRAFT

The increase for the past twelve months in the number of aircraft on the Civil Register was made by the disposal of surplus Service aircraft and importation of aircraft from overseas. The Government made available 42 Tiger Moths, to be transferred to the aero clubs for club training. Several of these machines have been delivered to the clubs in question and have been taken on the Register.

Additions to the Register are as follows:—

Public transport aircraft	18
Private aircraft	9
Club aircraft	50

made up as detailed below:—

Two Airspeed Oxfords (ex R.N.Z.A.F. and disposed of through War Assets Realization Board).

Three Auster V (imported from England).

One Avro Tutor 626 (ex Air Training Corps and sold to a private owner).

Four Douglas Dakota C. 47B passenger aircraft (ex R.N.Z.A.F. These machines were converted and overhauled in Australia).

Four Douglas Dakota C. 47B freighter aircraft (ex R.N.Z.A.F., converted and overhauled in the Dominion).

One D.H. C. 1 Chipmunk (imported from Canada, assembled in New Zealand).

Thirty-nine D.H. 82 Tiger Moths (ex R.N.Z.A.F., overhauled to civil requirements in New Zealand).

Three D.H. 83C Fox Moths (imported from Canada, assembled in New Zealand).

One D.H. 104 Dove (imported from England, assembled in New Zealand).

One Ercoupe (flown from Belgium by a private owner).

Four Lockheed Lodestars (purchased and converted in Australia; flown to New Zealand).

Three Miles Gemini (imported from England, assembled in New Zealand).

Two Miles Hawk (imported from England, assembled in New Zealand).
Six Percival Proctor (imported from England, assembled in New Zealand).
One Porterfield (ex R.N.Z.A.F. and disposed of through War Assets Realization Board).
One S.A.S. Monoplane (private construction in New Zealand).
One Catalina P.B. 2.B.1 flying-boat (ex R.N.Z.A.F.).
Two Short Sunderland flying-boats (ex R.N.Z.A.F., converted at Hobsonville).
One Short S. 25 Series IV flying-boat (imported from England).
One Walrus Amphibian Mark I (ex R.N.Z.A.F.).

The 4 Lockheed Lodestars were purchased in Australia by the New Zealand National Airways Corporation, who also took over the 8 Dakotas from the Air Department, to increase their fleet on the main trunk routes.

The Corporation purchased a Miles Gemini aircraft for the Westland service and took over two Short Sunderland flying-boats from R.N.Z.A.F. for the islands service.

De Havilland Aircraft Co. imported a D.H. 104 Dove from England and a D.H. C. 1 Chipmunk from Canada, the first of these types in New Zealand.

Other new types appearing on the register for the first time are Miles Gemini, Ercoupe, Catalina flying-boat, Walrus Amphibian, and S.A.S. Monoplane, the latter being a monoplane locally constructed in Christchurch. The aero clubs made several additions to their fleets.

The veteran Tasman flying-boat ZK–AMC was written off the Register, and a Short Sunderland of New Zealand National Airways Corporation was converted to scrap. Three Tiger Moths and a Percival Proctor were removed from the Register after crashing.

Change of ownership of aircraft was carried out in 23 cases.

On 31st March, 1948, there were 228 aircraft on the Civil Register, an increase of 74 on last year's figures. Aircraft registered comprised the following types and categories :—

(*a*)	Airspeed Oxford	2	Miles Gemini	3	
	Auster V	6	Miles Hawk	2	
	Avro Avian	2	Miles Magister Mk. III	1	
	Avro Tutor 626	1	Miles Whitney Straight	4	
	Beechcraft	2	Monocoupe M. 5	1	
	Desoutter	1	Monospar S.T. 25	1	
	Douglas Dakota C. 47	14	Percival Proctor Mk. I	7	
	D.H. 60 G. Moth	1	Percival Proctor Mk. II	1	
	D.H. 60 M. Moth	1	Percival Proctor Mk. V	3	
	D.H. 80 Puss Moth	2	Percival Vega Gull	1	
	D.H. 82 Tiger Moth	111	Piper Cub J. 2	2	
	D.H. 83 Fox Moth	5	Piper Cub J. 3	3	
	D.H. 89A Rapide	1	Porterfield 35 W	1	
	D.H. 89B Dominie	6	Rearwin	4	
	D.H. 90A Dragonfly	1	S.A.S. Monoplane	1	
	D.H. 94 Moth Minor	5	Waco	2	
	D.H. 104 Dove	1	Short S. 25 flying-boat	4	
	D.H. C. 1 Chipmunk	1	Short S. 30 flying-boat	1	
	Ercoupe	1	Short Sunderland flying-boat	2	
	Lockheed Electra 10A	5	Catalina P.B. 2.B.1 flying-boat	1	
	Lockheed Lodestar 18–56	13	Walrus Amphibian Mk. I	1	
(*b*)	Public transport aircraft	56			
	Private aircraft	51			
	Club aircraft	114			

Of this total shown, 150 were in service on current Certificates of Airworthiness, the remainder being at approved repair stations for rebuild or overhaul.

SECTION VII.—AERONAUTICS DIVISION

In April, 1947, the strength of the Division comprised the Chief Aeronautical Engineer, five Aircraft Surveyors, and one Assistant Aeronautical Engineer. During the year, the following appointments were made : one District Surveyor, four Assistant Aircraft Surveyors, one Examination Engineer, and two Engineers' Assistants.

The four Assistant Aircraft Surveyors have been posted to the four main centres, and in order that they may gain the widest possible experience their locations will be changed at nine-monthly intervals.

In order to meet present requirements there still remain vacancies for two Senior Aeronautical Engineers, two Aeronautical Engineers, and two Aircraft Surveyors.

Every effort is being made to fill these positions, and until suitable appointees are found the research and development programme to which the Division is committed cannot be implemented.

The work of various sections of the Division during the year may briefly be summarized as follows :—

(*a*) *Engineering Section*—

Investigation and approval of 176 Certificates of Airworthiness. Checking and approval of 43 modifications and 12 major repair schemes. Extensive detail work arising out of conversion and rework of Dakota, Lodestar, and Beechcraft aircraft.

Extensive flight tests on Sandringham aircraft in Australia and New Zealand, and reduction and correction of flight and cooling performance consequent upon the incident to ZK-AME on 3rd December, 1947, and in conformity with the recommendations of the Commission of Inquiry.

Investigation of aerodrome takeoff and landing performance for Lockheed 10A and Dominie aircraft using cine camera.

(*b*) *Examination and Approval Section*—

Preparation of revised Airworthiness Requirements.

Preparation of manual covering Register of Approved Firms and Products and complete reorganization of this aspect of divisional responsibility.

Detailed investigation of A.S.C. rating for Tasman Empire Airways, Ltd., and New Zealand National Airways Corporation.

Detailed statistical investigation into maintenance and flight records relating to trans-Tasman flights covering twelve months.

Correlation of New Zealand draft regulations with ICAO and British Commonwealth regulations in relation to personnel licensing.

(*c*) *Field Survey Section*—

Chief Surveyor completed a four-months period of secondment to Air Registration Board, London.

Preparation of draft of manual covering the Examination and Licensing of Aircraft Maintenance Engineers.

Preparation and analysis of inspectional statistics relating to the reconditioning of civil aircraft and to civil airworthiness standards, and for the issue, renewal, and validation of Airworthiness Certificates. These are as follows :—

Reconditioned to Certificate of Airworthiness standard	58
Surveyed for the renewal of Certificate of Airworthiness	115
Surveyed for validation of Certificate of Airworthiness	18

(*d*) *Technical Administration Section*—

Notices to Aircraft Owners and Engineers issued, 78.

Preparation and issue of Consolidated Notices to Aircraft Owners and Engineers.

Organizing arrangements and reporting discussions covering numerous major conferences held in Wellington.

Research and Development

During the year the Director of Civil Aviation and the Chief Aeronautical Engineer were appointed members of the New Zealand Advisory Aeronautical Research Council.

Three meetings of the Council were attended up to the time of Sir Ben Lockspieser's visit to the Dominion. This gentleman, who represented the United Kingdom Ministry of Aircraft Production, was able to furnish an outline of the programme under which units of the British Commonwealth would undertake to carry out specific research work.

The Chief Aeronautical Engineer was appointed a delegate to attend the Second Commonwealth Conference on Aeronautical Research held in Melbourne, and as a result of this Conference the Aeronautics Division is required to undertake certain research work.

A long-term project in relation to operational flight research, with particular reference to the investigation of gusts and the development of suitable recording-instruments, has already commenced.

Proposals have also been discussed and tentative plans drawn up for the provision of flight-performance-test equipment—in particular, V_g recorders and takeoff camera.

Commission of Inquiry

The Commission of Inquiry set up on 17th December, 1947, to investigate and report on the incident to one of the Tasman Empire Airways flying-boats has required the full co-operation of the Division, both as regards attendance at sittings of the Commission and in the resulting engineering and research work.

Examinations

Three examinations for maintenance engineers' licences were held at intervals simultaneously in Auckland, Palmerston North, Wellington, and Christchurch. Details are contained in Section X of this report. Setting and marking papers and conduct of oral examinations occupied 700 technical man-hours.

General

During the year a staff meeting was held over a period of three days of all technical officers in the Division. Considerable benefit in the internal organization of the Division's work resulted.

In the discharge of their official duties it is worthy of note that technical officers of the Division covered a total of 27,700 miles during the year, representing, in time, 12 per cent. of their working-hours.

SECTION VIII.—ACCIDENTS

The accident rate in commercial flying continues to be low, four reportable incidents occurred which caused no injury to any person and only minor damage to aircraft. In club and private flying fifty-four incidents were reported. Seven of these were fatal accidents, causing the death of three passengers and six pilots and destroying six aircraft. Two accidents in club flying resulted in injury to a passenger and to a pilot.

Non-commercial accidents which have an adverse effect on civil aviation as a whole, can be expected to decrease following the tightening-up of training procedures arising from the adoption of ICAO requirements and from the efforts being made to secure wider appreciation of the factors which cause aircraft accidents.

SECTION IX.—AIR TRAFFIC CONTROL AND SEARCH AND RESCUE

During the year the air traffic control organization ceased to be operated and manned by the R.N.Z.A.F., and is now established within the Civil Aviation Branch of Air Department.

The objects of the service are to promote the safe, orderly, and expeditious movement of air traffic, both civil and military, within New Zealand and in the South Pacific.

The service operates three area control centres and sixteen control towers within New Zealand and one area control centre and four control towers in the Pacific, including the international airport at Nandi, Fiji.

Considerable progress has been made with the installation of radio navigational aids throughout the year, resulting in increased effectiveness of control, particularly during deteriorated weather conditions.

The search and rescue organization remains substantially the same. The co-ordination of information, the channels of communication, and the placing of operational units on the alert are the responsibility of the air traffic control organization, while the physical search is carried out by aircraft on the Civil Register, aircraft of the R.N.Z.A.F., or marine craft, depending on the type of operation involved. Rescue co-ordination centres are established within the four area control centres, and the R.N.Z.A.F. maintains search aircraft at Wigram, Whenuapai, Hobsonville, and at Lauthala Bay.

SECTION X.—LICENSING

Although a small increase only is shown in the total number of Pilots' "A" Licences current at 31st March, 1948, as against the corresponding figures on 31st March, 1947, this does not mean that aero clubs throughout New Zealand have curtailed training operations. On the contrary, the clubs have trained almost twice as many pupils during the past year as during the preceding twelve months. It is apparent, however, that many private (and commercial) pilot-licence holders who procured licences upon discharge from the Services have decided that no good purpose is served by continuing to renew their licences and have consequently allowed them to lapse. The figures show, therefore, that the issue of new "A" Licences has approximately equalled the number which has lapsed.

With respect to "B" Licences, the number current has increased from 200 to 264, due chiefly to the requirements of the New Zealand National Airways Corporation for ex-Service trained pilots holding commercial licences.

The following table sets out the types of licences current as at 31st March, 1948, with comparative figures as at 31st March, 1939 and 1947, respectively:—

Licence or Certificate.	Total current during 1938–39.	Total current as at 31st March, 1947.	Total issued during Year 1947–48.	Total current as at 31st March, 1948
Pilot's "A" Licence	205	863	438	875
Pilot's "B" Licence	26	200	122	264
Navigator's Licence—				
First Class	1	18	7	22
Second Class	1	25	9	29
Radio Telegraph Licence—				
First Class	..	13	10	20
Second Class	..	4	3	2
Third Class	..	53	32	78
Temporary	..	..	14	14
Radio Telephone Licence	..	8	..	7
Flying Instructor's Authority ..	..	44	31	68
Aircraft Engineer's Licence	16	125	45	171
Aerodrome Licence—				
Public	5	15	..	8
Temporary	12	..	1	..

It is pleasing to note that a considerable number of pilots were trained during the year by aero clubs and companies. As the years pass since the end of the war, those Service-trained pilots willing or able to take up careers in civil aviation are rapidly decreasing

in number, so that the output of the clubs is of great importance in that it is largely from the club-trained pool that airline pilots of the future will be recruited. Furthermore, the value of this air potential in time of war cannot be overestimated.

The following list shows the number of *ab initio* trainees who passed through the aero clubs or companies indicated and who were issued with "A" Licences during the twelve months ended 31st March, 1948 :—

Auckland	12
Canterbury	26
Central Hawke's Bay	1
Gisborne	8
Hauraki	2
Hawera	5
Hawke's Bay and East Coast	9
Marlborough	14
Masterton	5
Middle districts	19
Nelson	12
New Plymouth	13
Opotiki	4
Otago	8
Piako	4
Southern Cross Aviation Co.	2
South Canterbury	12
Stratford	6
Tauranga	8
Waikato	22
Waikato Aviation Co.	4
Wairarapa and Ruahine	12
Waitomo	2
Wanganui	6
Wellington	11
West Coast United	7
Total	234

No examination for Second-class Navigators' Licences was held during the year, due to the fact that the Standards and Practices of the International Civil Aviation Organization, which will shortly be adopted by New Zealand, do not permit licences in this category.

The following table shows the results of the various examinations conducted by the branch during the year :—

Examination.	Number conducted.	Number of Candidates.	Passed.	Failed.
"B" Licence	4	217	146	71
First-class Navigator's Licence	2	33	14	19
Aircraft Engineer's Examination—				
Category "A"	3	49	26	23
Category "B"	3	9	4	5
Category "C"	3	60	32	28
Category "D"	3	2	2	..
Category "X"	3	29	20	9

I have, &c.,

I. A. Scott,

for Director of Civil Aviation.

REPORT OF DIRECTOR OF METEOROLOGICAL SERVICES FOR THE YEAR ENDED 31st MARCH, 1948

The Hon. the MINISTER OF DEFENCE.

I HAVE the honour to submit the following report on the work of the Meteorological Service for the year ended 31st March, 1948.

GENERAL

Shortage of staff, particularly of professional officers, remains the most serious problem of the Meteorological Branch. Routine services have been maintained on the same reduced scale as during the previous year, and it has been impossible to make provision to meet increased demands which will arise shortly as a result of the steady expansion taking place in air services both in New Zealand and on overseas routes. Nor has it been possible to devote adequate time to essential research and studies designed to improve the general standard of forecasting both for the general public and for aviation.

International Conferences.—The Director represented New Zealand, during the year under review, at two important meetings of the International Meteorological Organization. At the invitation of the Canadian Government, meetings were held in Toronto over the period 4th August to 13th September, 1947, of the ten Technical Commissions of the Organization. With two exceptions only, none of the Commissions had met since pre-war years, and in view of the great developments in meteorology which took place during the war the Toronto meetings were of unusual importance. They were attended by representatives from forty-seven different countries and, in all, over two hundred delegates were present. More than four hundred resolutions were adopted for final consideration by the succeeding Conference of Directors. They were designed to ensure the requisite measure of co-ordination on an international basis, and covered all phases of meteorological activity. Apart from the value of the technical discussions, great benefit was derived from the personal contacts made with leading meteorologists from all parts of the world.

Immediately after the Toronto meetings, a short session was held in Montreal of the Meteorological Division of the International Civil Aviation Organization. By this means complete unanimity was achieved between the recommendations of the Commission for Aeronautical Meteorology of the International Meteorological Organization and those of the Meteorological Division of the International Civil Aviation Organization.

The Conference of Directors of the International Meteorological Organization was held in Washington, at the invitation of the United States Government, from 22nd September to 11th October, 1947. The Conference had an exceptionally heavy programme. In addition to consideration of the reports of the ten Technical and six Regional Commissions, a convention for a new World Meteorological Organization was drawn up and signed by authorized delegates. The existing International Meteorological Organization has operated, since its inauguration in 1872, on an official level as an association of the Directors of National Meteorological Services throughout the world. The great developments in the application of meteorology that have taken place in recent years, and are still taking place, made it desirable to raise the status of the Organization to an inter-governmental level, similar to the International Civil Aviation Organization and the International Telecommunications Union. The New Zealand Government has since ratified the new convention, which will come into force as soon as thirty countries have signified their ratification.

The Conference in Washington was a memorable one not only because of the signing of the new convention, but because of the great volume of work achieved on the technical side. International co-ordination and uniformity of practice has been achieved in all the important fields of meteorology.

Aviation Forecasting

Forecasting Activities.—The year has been a most difficult one for the aviation forecasting service, due to the continued shortage of professional staff combined with the increased demands resulting from the expansion of commercial and aero club flying activities. To meet the position, we have reluctantly closed temporarily two of the smaller aviation forecasting offices and concentrate work in the larger offices. Those closed have been Lauthala Bay (Fiji) and Whenuapai. As soon as sufficient trained staff can be obtained, it is intended to open also forecasting offices at Palmerston North, Harewood, and Ohakea.

In April, 1947, New Zealand took over from the United States the responsibility for the meteorological service at the International Airport at Nandi, Fiji, and established a full forecasting office there. At the close of the year aviation forecasting offices were functioning at only Nandi, Mechanics Bay, Wigram, Taieri, and Paraparaumu, the last named having been transferred from Rongotai in September, 1947.

The main cause for concern over the restriction in the number of forecasting offices on aerodromes is that there has been a most undesirable reduction in the amount of personal briefing of crews by forecasting officers. In this regard the internal aviation services have suffered to a greater degree than the overseas services using Mechanics Bay and Nandi. Maintenance of the scale and standard of service at Nandi and Mechanics Bay, however, would not have been possible without the assistance of three forecasters assigned for duty at those places by arrangement with Pan-American World Airways, Inc.

Aircrew Training.—In addition to forecasting activities, the aviation meteorological service has continued to provide the requirements of the civil aviation authorities and the R.N.Z.A.F. for the training and examining of pilots and navigators in the subject of meteorology.

International Co-operation.—The Principal Meteorologist (Islands) represented the Meteorological Service at the meeting of the South Pacific Air Transport Council held at Canberra in August, 1947. Our interest in this Council is very considerable by virtue of the arrangement whereby New Zealand provides, on behalf of the United Kingdom, the aviation meteorological facilities in Fiji and those territories of the High Commission of the western Pacific east of longitude 170° E.

In September, 1947, the Officer in Charge, Forecasting, visited Melbourne to assist in the drafting of a new "Manual of Operations for International Air Routes in the South Pacific" ("FANZARO," 5th Edition) in conformity with the procedures of the International Civil Aviation Organization. This manual was brought into operation on 1st January, 1948.

General.—Close liaison has been maintained within New Zealand with the R.N.Z.A.F., the Civil Aviation Branch, and the various operating companies. Technical advice has been supplied as required on matters concerning flying operations, major items in this regard being the data supplied to the Tasman Empire Airways Commission of Inquiry, and to the Fiji International Airport Commission.

General Forecasting

The organization of forecasting for the general community, as distinct from aviation forecasting, is the responsibility of the forecasting office at Kelburn, Wellington. With the exception of certain local city forecasts given from the Commercial broadcasting stations at Auckland, Christchurch, and Dunedin, and answers to local inquiries in these cities, all general forecasts are issued from Wellington.

The preparation of forecasts supplied to the press and issued over the radio forms the principal routine task of the General Forecasting Section. In addition to the three main broadcasts over the stations of the National Broadcasting Service, forecasts are issued each day to eleven morning papers and twenty-eight evening newspapers distributed throughout the country.

Forecasts for shipping in the New Zealand area are broadcast twice daily, and, in addition, coastal shipping is catered for by broadcasts of selected weather reports from coastal stations in New Zealand. These reports are transmitted twice daily by radio telephone from Musick Point, Wellington, and Awarua Radio Stations.

Another routine duty of the Wellington Forecasting Office has been a telephone discussion each day with the load-dispatcher of the Hydro-electric Department at Hamilton on the likelihood of rain in the catchment areas in which they are interested and the possibility of major changes in loading due to sudden variations in temperature throughout the North Island.

Catchment Boards have been advised on all occasions when it is considered that exceptionally heavy rain may cause flooding, while the Harbourmasters at the major ports in New Zealand receive daily advice of weather which may affect local shipping activities.

Forecasts during periods of fire danger have been supplied to the State Forest Service, and considerable forecasting has been done during the past year for N.Z. Aerial Mapping, Ltd., the planning of whose work depends primarily on weather conditions.

Replies to individual requests for forecasts have constituted a major section of the forecasters' work. In this connection, farmers and others wanting individual forecasts are encouraged to give as much notice as possible of their requirements. Replies to such inquiries from a distance are normally sent by "collect" telegram. The farming community has taken considerable advantage of this service, some of them asking to be notified on all occasions over a period of some months when certain weather conditions were to be expected.

Two important forecasting projects during the year were that for the Agriculture Department in their attempt to minimize the danger of facial eczema among sheep during the unusually warm dry period in middle and late summer, and that for the G.s.s. "Matai" while repairing submarine cable in the vicinity of Cape Brett and Norfolk Island. The latter forecasts were issued from the Mechanics Bay office in Auckland. In both cases the forecasts provided proved of considerable value.

Collection and Dissemination of Synoptic Information.—As a prerequisite to making the best use of all reports available, the rapid exchange of information is essential. The general supervision of the operation of the meteorological teleprinter network has been made the responsibility of the Wellington Forecasting Office. This network connects the radio stations and telegraph offices at Auckland and Wellington with the local meteorological offices, as well as linking the meteorological offices at Whenuapai, Mechanics Bay, Ohakea, Palmerston North, Paraparaumu, Kelburn, Woodbourne, Wigram, and Taieri.

In addition, the Wellington office prepares and broadcasts in international meteorological code from Post and Telegraph Department radio transmitters a selection of weather reports collected in the New Zealand area for the information of overseas meteorological authorities. These "collectives" comprise reports from land stations, ships, and aircraft, as well as upper-air information. Coded copies of the analyses of the surface-weather charts and of the chart for the 700 millibar level are also broadcast. In all, these coded messages total between 65,000 and 70,000 groups per month.

In addition to its aviation activities, the meteorological office at Nandi Airport, in Fiji, has provided regular forecasts for the Fiji area for transmission by the broadcasting station in Suva and has maintained a system of hurricane warnings covering the South Pacific region. The Nandi office also broadcasts "collectives" of weather reports and a coded weather-map analysis for the South Pacific islands area.

Climatology

The application of scientific methods in agriculture, industry, commerce, transportation, communications, &c., has created an ever-increasing demand for more detailed statistics of climate and weather. The analysis of early climatological records, a few of which extend back to the middle of last century, provides valuable information relating to a limited number of stations. Through the active co-operation of several other Government Departments, local bodies, and hundreds of voluntary observers, a steady increase in the number of observing stations has been made possible. Grateful acknowledgment of their valuable services is made to these voluntary observers in particular, and to all others who assist in the task of collecting meteorological data.

Climatological Stations.—During the year the number of climatological stations increased by 9 to the present total of 108 (including 12 in Pacific islands). Additions during the year were as follows :—

Marton.	Whakatane.
Maramarua.	Earnscleugh.
Oratea.	Greymouth.
Pureora.	Opotiki.
Gwavas.	Pukahanui.
Glenbervie (Whangarei).	

Following a period of overlap with readings from Rotorua Aerodrome, the station which had been maintained by the Tourist Department in Rotorua was closed down. The station at Roslyn, Dunedin, was also closed after an overlap with records from the new station at Musselburgh.

Climatological observations are made daily at 0930 hours and include readings of rainfall, air temperature and humidity, maximum and minimum temperature, and, at selected stations, soil temperatures, duration of sunshine, run of wind, evaporation, and barometric pressure.

Rainfall Stations.—In addition to the rainfall records available from full climatological stations, additional records were received monthly from some 670 rainfall stations, while about 100 private observers supplied copies of their readings at the end of 1947.

The task of finding additional voluntary observers necessary to bring the national network of rainfall stations up to the desired total of 1,100 has been undertaken in conjunction with the Public Works Department and the Catchment Boards. Sites were approved and manual gauges installed at 70 new stations during the year. In addition to the national network of rainfall stations, plans were approved by the Soil Conservation and Rivers Control Council for the inauguration of a subsidized network of rainfall stations, organized by Catchment Boards, to supplement the data from the national network in special areas. Records from the subsidized network are to be forwarded to this Service for analysis and publication.

The installation of additional recording rain-gauges was held up to some extent pending the arrival of new instruments on order. Inquiries have been made in other countries concerning the availability of a suitable long-period-recording rain-and-snow gauge for installation in remote sites near the headwaters of some of our major rivers.

In our efforts to tap additional sources of climatological data we have succeeded in obtaining some valuable series of observations from other Government Departments. In many cases it was found that the use of unsuitable instruments in unsatisfactory exposures made the interpretation of the records very difficult. Further efforts are therefore being made to have uniform methods of observing and recording the basic information adopted throughout the country. In pursuance of this policy, arrangements have been made to take over climatological stations and equipment which were formerly the responsibility of the Public Works Department.

General.—While many inquiries could be dealt with from statistical information already assembled in anticipation of the needs of the community, a number of special investigations were carried out on behalf of those engaged in such activities as river control, the supply of power and water, town-planning, and the establishment of new crops or industries, to mention but a few.

Some progress has been made in the preparation of an extensive analysis of rainfall data which has been undertaken at the request of the Soil Conservation and Rivers Control Council. Frequent changes of staff, and the time absorbed in the training and extra supervision of new staff, have had an adverse effect on the progress of this and the other work of the section. Further difficulties have been created by an acute shortage of storage space required for the filing of the ever-mounting volume of climatological records.

The typing of the "Annual Observations" for the years 1943 and 1944 was completed and the drafts despatched to the Government Printer for reproduction. It is hoped that by the end of 1949 this series, publication of which was discontinued during the war years, will have been brought up to date. The "Climatological Table" was published monthly in the *New Zealand Gazette.*

Reporting Organization and Instruments

The basis of any meteorological service is a system for the provision of comprehensive, accurate, and regular reports on the processes occurring in the earth's atmosphere. Upon the raw material of these weather reports are dependent the technique of forecasting, climatological investigations, and meteorological research. To ensure this continuous flow of weather data the Reporting Branch of the Meteorological Service is subdivided into three main sections, as under:—

Establishment and maintenance of networks of reporting stations on land and sea for observations both at the surface and through the upper atmosphere.
Equipping these stations with suitable meteorological instruments.
Training of staff to operate the stations.

The existing organization and the work accomplished during the year are summarized below for each of these sections.

Reporting Network.—The area from which the Meteorological Office receives reports covers some 30,000,000 square miles, or about one-seventh of the earth's surface, stretching from the Equator to the Antarctic, and from Australia in the west to the far-eastern waters of the Pacific Ocean.

As part of the world-wide scheme developed by the International Meteorological Organization and the International Civil Aviation Organization, New Zealand is responsible, either directly or on behalf of the United Kingdom for the establishment and operation of synoptic and other types of weather-reporting stations throughout much of this region. The numbers of synoptic stations, together with the numbers in actual operation at 31st March, 1948, are shown in the following table:—

—	New Zealand.		Pacific and Outlying Islands.	
	International Requirement.	In Operation 31st March, 1948.	International Requirement.	In Operation, 31st March, 1948.
Third-order reporting stations (surface observations)	22	22	46	34
Second-order reporting stations (pilot-balloon observations)	11	11	16	8
First-order stations (radiosonde observations) ..	3	2	6	Nil.
First-order stations (radar wind observations) ..	3	2	6	Nil.

In addition to the synoptic reporting stations that are necessary to meet international requirements, 2 second-order and 83 third-order stations, which are needed for internal purposes only, were in operation at the end of the year.

New stations established during the year were :—

Surface observations .. Paraparaumu Aerodrome; Hawera; Great Barrier Island.

Pilot-balloon observations .. Tarawa Island.

The station at Rongotai Aerodrome was closed on 22nd December, 1947.

The number of separate weather reports prepared by all the above stations during the year exceeded 300,000.

The daily aircraft aerological ascent made at Wellington during the past few years was transferred to Ohakea consequent upon the closing of Rongotai Aerodrome. The accuracy of the temperature soundings was considerably increased in February, 1948, when the latest Air Ministry type of aircraft psychrometer was fitted to the Harvard aircraft making these flights.

The collection of weather reports from ships at sea was reorganized during the year to adapt the system to the prevailing conditions of sea transport. The number of ships serving as New Zealand selected ships and equipped by New Zealand is now 19. Some 40 vessels engaged on time-charter in the South Pacific area also report as opportunity permits. Regular inspections of, and courtesy visits to, ships in the ports of Auckland, Wellington, and Suva have been carried out. The number of reports received from ships during the year was 9,698, the total for the previous year being 5,936.

The number of ships using the shipping broadcast is steadily increasing and the general "weather consciousness" of shipping in the seas around New Zealand is becoming strongly established, to the mutual benefit of the ships and the Meteorological Service. Close co-operation with shipping interests has been fostered by the appointment in June, 1947, of a full-time Port Meteorological Officer at Wellington.

Meteorological Instruments.—Although wartime shortages have not yet been entirely overcome, we have been able to meet all regular demands for the supply of meteorological instruments from stocks mostly obtained through the Meteorological Office, Air Ministry, England.

The first of the Australian-made radiosondes came to hand during the year, and these, together with a further supply of recovered and surplus wartime radiosondes that were reconditioned by the Dominion Physical Laboratory, Scientific and Industrial Research Department, enabled the radiosonde stations at Auckland and Hotitika to operate continuously.

The first of four new ME 7 meteorological radar sets being built by the Dominion Physical Laboratory was installed during September, 1947, at Whenuapai Aerodrome in place of the original experimental set. Several minor modifications in the design were found to be desirable, and these have been put in hand. Final acceptance tests have not yet been completed.

The existing arrangement whereby all instrument maintenance requiring special equipment is done by the Dominion Physical Laboratory has been continued. For the maintenance of electronic equipment, however, a maintenance organization consisting of one senior and one inspecting electronic technician, together with one station electronic technician for each radar-wind station, was set up, and the positions were filled during the year. Originally these technicians were under the technical control of radio engineers at the Dominion Physical Laboratory, but when the Civil Aviation Branch established and filled the position of Principal Radio Engineer, the senior and inspecting electronic technicians were transferred to Civil Aviation Branch control,

while the station technicians, who are also responsible for the technical supervision of the operation of the wind-finding equipment, remained under the control of the Meteorological Office. It is expected that this arrangement, whereby the engineering and maintenance resources for radio and radar equipment of the Civil Aviation and Meteorological Branches are pooled, will result in a saving both in man-power and equipment.

The Instrument Section co-operated with the Dominion Physical Laboratory in the setting-up of meteorological instruments at the Earnsclough Experimental Farm for the purpose of frost research. This installation comprised a full climatological station, together with a 50 ft. mast on which were mounted temperature and humidity instruments at various heights. Additional ground stations were installed in adjacent areas to investigate the variation of frost intensity throughout the whole Central Otago fruit-growing area.

Training of Observers.—This section is responsible for the inspection of all types of weather stations, as well as the training of staff of the Meteorological Service and the staff of other Departments engaged on weather reporting.

Eighty-six inspections of weather stations of various types were arranged during the year for the purpose of installing new equipment and giving instructions to the observers. Miscellaneous instruction in weather observing and reporting was also given to members of the Marine Department, Post and Telegraph Department, and various Boy Scout organizations. A scheme for the training of Native observers in the Cook and Samoan Groups was instituted in conjunction with the Island Territories Department.

On completion of the demobilization of the meteorological staff from the Air Force it became necessary to reorganize the wartime examination system of the service. In conjunction with the Public Service Commission, a scheme for the training and examination of meteorological observers was drawn up and put into effect in 1947. The first examination was held in August, 1947. As part of the training scheme, a correspondence course for the Observers' Senior Examination was prepared and a full course of twenty assignments issued.

Schools for the initial training of observers for the staff of the Meteorological Service were also held as required throughout the year at Auckland, Wellington, and Christchurch, some 30 officers completing the courses.

Research

Provision is made in the establishment of the Meteorological Service for a Research Section, comprising two professional officers and two assistants, the main task of which is to carry out systematic practical and theoretical studies in the meteorology of New Zealand and the surrounding regions, with the aim of improving the accuracy of current weather forecasts and extending the time range of their validity. It is also responsible for the co-ordination and supervision of research work done at branch offices of the New Zealand Meteorological Service both in New Zealand and in the Pacific. In all cases great attention is paid to meteorological work done overseas with a view to possible applications of these results to rather specialized local conditions.

Unfortunately, the staffing position during the greater part of the year under review did not permit any part of the establishment to be filled, and it was not until February, 1948, that conditions improved sufficiently to allow one research officer to take up his duties. Again under normal staffing conditions the establishment is such as to permit each forecaster in the various branches to denote about one-quarter of his time to study and investigations designed to improve the general standard of the service, but with the current shortage of staff most officers are kept fully occupied on routine forecasting rosters.

In spite of these difficulties, a limited number of research projects has been carried out, and the main fields of activity are indicated below.

At Head Office the results obtained from the frost investigations made during the spring of 1947 in central Otago have been made the subject of preliminary analysis and discussion. Instrumental difficulties are gradually being overcome, but further work is necessary before we shall be in a position to begin detailed forecasts for fruit-farmers.

As a natural extension of the work in Central Otago, a preliminary survey of the frost problem in the Hastings fruit-growing district has been commenced, and further investigations are planned for the coming spring. In connection with these projects the meteorological staff have worked in co-operation with the Auckland Industrial Development Laboratory and the Plants Diseases Division of the Department of Scientific and Industrial Research to test the feasibility of frost-protection methods.

In view of current scientific interest in meteorological processes in the Antarctic and high southern latitudes, and taking into account the increasing amount of information which is now becoming available, some preliminary studies have been made with a view to finding out how this material might best be used in the daily forecast service. These studies are incomplete, but will be pursued as time permits.

At branch offices the following projects are in progress or have already been completed during the year :—

(*a*) *General Forecasting Office, Kelburn.*—A study of the meteorological situations associated with daily rainfalls of over fifty points at Waihopi Power-station has been completed and has proved very useful in preparing daily forecasts for transmission to the Engineer in Charge. The use of these forecasts enables a certain saving of fuel and permits more economical operation of the station.

(*b*) *Meteorological Office, Auckland.*—In conjunction with the Physics Department of the local University college, an investigation is being made of the distribution of electric potential inside cumulus clouds, utilizing a modified radiosonde technique. A study is also being made of the variation of tropopause heights and high-level winds at Auckland in relation to the movement of pressure systems. In addition, an investigation has been made of weather and flying conditions along overseas air routes, and information is being collected on turbulence in active cumulus clouds.

(*c*) *Meteorological Office, Paraparaumu.*—An investigation is being made of local weather conditions at various airfields throughout New Zealand with a view to improving the forecasting of terminal conditions, especially with regard to surface winds and weather minima.

(*d*) *Meteorological Office, Taieri.*—This office has been intimately connected with the Central Otago frost investigations and has been specially concerned with the inspection and maintenance of equipment at the meteorological base at Earnscleugh.

(*e*) *Meteorological Office, Fiji.*—Work has been continued on the elucidation of certain anomalous features of the diurnal pressure wave in the tropics by using pressure data at Suva and Nandi.

Library and Publications

Library.—A specialized library service has been maintained covering all phases of meteorological work both in New Zealand and overseas. This year has seen a continued improvement in the number of publications received from overseas and a widening of our active exchange relations with many countries. In this way a number of important additions have been made to the library and many gaps due to war conditions have been filled.

During the year some progress has been made with the classification of the library and the compilation of the index according to the decimal classification system adopted by the International Meteorological Organization. The completion of this task will

satisfy a long-felt want and will add greatly to the usefulness of the library. The monthly library acquisition list has been expanded in order to mention specifically the more important papers appearing in the meteorological literature as well as the journals in which they appear.

The library has also dealt with many requests from the general public for information covering a wide range of subjects, and it appears that this public relations aspect of library service is likely to increase in future years.

Publications.—In addition to the regular appearance each month of climatological data in the *New Zealand Gazette*, the following publications were issued by the Meteorological Service during the year under review :—

(*a*) *Meteorological Office Notes.*—These publications contain the results of meteorological research work which is not of an over-specialized nature, so that the information is often of considerable value to New Zealand scientists working outside the field of meteorology. They are reprinted from the *New Zealand Journal of Science and Technology*. During the year, issue No. 31, "Temperatures associated with Rainfall in New Zealand," by F. Bondy and C. J. Seelye, was published.

(*b*) *Technical Information Circulars.*—In order to supplement the library material circulated to branch meteorological offices, extracts or abstracts of the more important meteorological papers are cyclostyled and issued for retention by branches as N.Z.M.O. Technical Information Circulars. During this year ten circulars, Nos. 46 to 55, were issued.

(*c*) *Circular Notes.*—To promote local investigations and to improve the standard of forecasting and observing throughout the Service, members of the staff are encouraged to prepare notes of local interest and significance. These are cyclostyled and issued within the Meteorological Service as N.Z.M.O. Circular Notes, of which four, Nos. 42 to 45, were issued during the year.

(*d*) *Instructional Circulars.*—These cover necessary instructions to branch offices ; twenty-one circulars, Nos. 71 to 91, were issued during the year.

Staff

During the year there has been no improvement in the staff position and the Service has continued to operate well below the approved establishment. The comparative position is shown in the following table :—

	Establishment.	Strength at 31st March, 1948.	Strength at 31st March, 1947.
Professional officers	48	36	32
Observers	139	114	123

Of the thirty-three professional officers, three are Pan-American Airways Co. forecasters on temporary attachment to the Service and four are junior officers still under training. The above table does not include the Native meteorological observers provided by local Administrations in the Pacific islands area.

Because of the high incidence of shift work in the Meteorological Service, the recent decision of the Public Service Commission to pay penal rates for work performed on Saturday afternoons and Sundays has been a source of great satisfaction and should help very materially in our efforts to recruit additional staff. Almost all the work in the Meteorological Service continues twenty-four hours a day seven days a week, and

hitherto no compensation was made for the manifest disadvantages of having to work rosters at week-ends. This condition offered a sever deterrent to prospective applicants for positions, and the new system should enable us to compete for staff on a more equitable basis.

Early in March this year advertisements were inserted in a number of newspapers throughout New Zealand calling for applications for positions of meteorological observers under the new conditions, in which penal rates apply. The response was particularly gratifying, and it is hoped that a sufficient number of suitable men will be recruited to enable the observer establishment to be brought up to full strength.

By contrast with the observer staff, the position regarding professional officers still remains very serious. Although the payment of penal rates applies also to professional staff, the supply of graduates is strictly limited and the competition very keen. One graduate only joined the staff during the year. Arrangements were made through the High Commissioner in London to advertise for professional officers in England. Although a number of applications was received, the chances of being able to attract suitable men with previous meteorological experience appear small.

The shortage of staff, particularly in the case of forecasters, has placed a very heavy burden on the remaining members of the Service, and their cordial and loyal co-operation is again acknowledged with pleasure.

I have, &c.,

M. A. F. BARNETT,

Director of Meteorological Services.

Approximate Cost of Paper.—Preparation, not given; printing (733 copies), £95.

E. V. PAUL, Government Printer, Wellington.

Price 1s.]