

Civil Aviation Authority



Falkland Islands

Report on a Study of the
Operating Procedures of the
Falkland Islands Government Air Service

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Report on a Study of the Operating Procedures of the Falkland Islands Government Air Service

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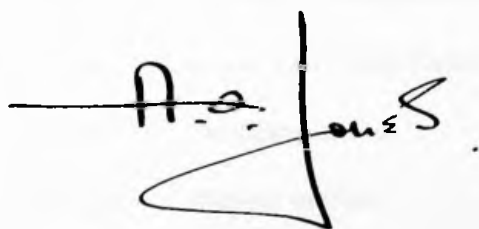
His Excellency The Governor of the Falkland Islands
Government House
Port Stanley
Falkland Islands

The undersigned have the honour to present a report on their study of the operating procedures of the Falkland Islands Government Air Service.

They would be happy to provide any further advice on the implementation of their recommendations should this be required.

A handwritten signature in black ink, appearing to read 'R. L. C. Branson', with a long horizontal line extending to the left.

R L C Branson
Principal Flight Operations Inspector
Directorate of Flight Operations

A handwritten signature in black ink, appearing to read 'A. O. Jones', with a long horizontal line extending to the left.

A O Jones
Operations Officer
Directorate of Operational Services Overseas

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1 INTRODUCTION

1.1 In April 1973 a request was received by the West Indian and South Atlantic Department of the Foreign and Commonwealth Office from the Chief Secretary of the Falkland Islands Government for advice on technical aspects of the Falkland Islands Government Air Service. This request was formalised in July 1973 by an official application for Technical Assistance in the form of the provision of a technical expert. After consultation with both the Civil Aviation Division of the Department of Trade and Industry and with the Directorate of Operational Services Overseas of the Civil Aviation Authority it was agreed that a two man team should visit Port Stanley as early as possible. It was decided that the team should be composed of Captain R L C Branson, a Principal Flight Operations Inspector, and Mr A O Jones an Operations Officer from the Directorate of Operational Services Overseas, both of whom have considerable experience of flying boat operation. Because of previous commitments the team was unable to leave London before 26 October, and arrived in Stanley on 29 October.

1.2 The terms of reference of the team were as follows:

To advise the Colony Government generally on matters concerning the internal air service and in particular to

- (i) consider the service's operating procedures;
- (ii) advise on the maximum weekly and daily flying hours and number of landings permissible for the pilots;
- (iii) advise on the level of staffing needed to permit flying to take place seven days per week;
- (iv) advise on the feasibility of amalgamating the Aviation, Harbour and Meteorological Departments and the level of staffing required to effect this amalgamation;
- (v) advise on the future of the Falkland Islands Government Air Service in general, and in particular whether efforts should be made to attract a private company to the Colony;
- (vi) advise on whether the arrangements followed for medical checks on the pilots are satisfactory.

1.3 Prior to departure from London a table of flying hours covering the period from January 1971 to June 1973 was made available to the team, together with a copy of the Pilots Orders issued by the Superintendent of Civil Aviation. This latter document, while containing some material relating to operating procedures and limitations, cannot be considered to comply with Article 21 of the Colonial Air Navigation Order 1961 in respect of the provision and content of an Operations Manual required by the Article.

1.4 During the team's visit to Stanley discussions were held inter alia with the following persons:

- | | |
|------------------------------|--|
| Mr E G Lewis CMG OBE | - His Excellency the Governor |
| Mr D R Morrison | - Acting Chief Secretary |
| Mr J Kerr MBE | - Superintendent of Civil Aviation |
| Dr J H Ashmore | - Senior Medical Officer |
| Mr L J Halliday | - Collector of Customs, Harbourmaster and Agricultural Officer |
| Mr Swann | - Meteorological Officer |
| Mr A Sloggie | - Manager, Falkland Islands Company |
| Mr M Knight | - Manager, Cable and Wireless Ltd |
| Vice-Comodoro C de la Colina | - Manager, Lineas Aereas del Estado |

2 PREVIOUS STUDIES

- 2.1 A transportation study for the Falkland Islands was carried out by Peat, Marwick and Mitchell Ltd in May 1971. Their report concluded that the services provided were of an unnecessarily high quality, and recommended a limited reduction should be effected primarily by means of the introduction of a form of scheduling which would require passengers to travel only when a service is available. This policy was aimed at increasing the load factor with a consequent reduction in operating cost.

The report further recommended eventual replacement of the existing float planes by land planes, and suggested that the Superintendent of Civil Aviation should survey all settlements on the Islands to indicate where grass landing strips for light aircraft could be prepared. It would then become the responsibility of each settlement to prepare its own landing strip should its owner or manager require to continue to use the Air Service.

- 2.2 As will be explained later in this Report, the CAA team were unable to agree with either of these recommendations.

3 FALKLAND ISLANDS GOVERNMENT AIR SERVICE (FIGAS)

3.1 Operating Procedures

- 3.1.1 The Colonial Air Navigation Order, 1961, as amended by five subsequent Amendment Orders, namely Statutory Instruments No. 2597 of 1962, No. 1966 of 1963, No. 588 of 1965, No. 1090 of 1968 and No. 455 of 1972, sets out statutory requirements for the regulation of civil aviation in the Colonies and other territories mentioned in the Fifteenth Schedule to the Order, which includes the Falkland Islands and Dependencies. Enquiries made by the CAA team revealed that neither the Superintendent of Civil Aviation, the Secretariat, nor the Registrar's Office was in possession of a fully amended copy of the Order.

- 3.1.2 Many of the Articles of the Order are not complied with by the Air Service and in some cases it was found that this was simply due to the fact that the relevant Amendment Orders had not been seen. In other cases, due to the somewhat unorthodox nature of the operation, compliance may be either impracticable or even undesirable. In these cases it may be considered necessary that exemption, either absolutely or subject to appropriate conditions, from some of the provisions of the Order should be granted by the Governor under the power to take such action conferred by Article 79. In other cases operating procedures should be modified or new procedures introduced to comply with the provisions of the Order. These will be noted under separate headings of the report and summarised in the final conclusions.

- 3.1.3 In general the team found no evidence that operations carried out by the Air Service were in any way unsafe, but there were a number of matters in which they were technically in breach of the Order. A matter of particular concern was that there was no meaningful or positive control to guard against crew fatigue. Cases have been recorded of pilots flying in excess of 12 sectors in a single flying duty period. Before proceeding with specific areas in which action was found necessary there follows a brief description of the Air Service and its day to day operation.

3.1.4 FIGAS operates two De Havilland Beaver float planes based at Stanley operating a non-scheduled virtually on demand taxi type service serving more than forty isolated settlements and sheep farming stations widely dispersed throughout the group of islands. Roads are practically non-existent, there is no inter-island service by sea and the only practicable means of communication is by air. The furthest of these settlements from the Stanley base is New Island in the West of the group at a distance of 131 nm. Direct flights over such distances would rarely occur except perhaps in the case of a medical emergency, as daily flight planning is normally arranged to cover as many en-route stops as possible.

3.1.5 Both passenger and freight bookings are made by telephone, by radio or in person at the FIGAS office on the pier at Stanley which is manned by one full time clerk who also maintains a radio watch during hours of operation. The Superintendent of Civil Aviation also attends the office when his flying duties so permit. Reservations are normally made no more than a few days ahead so that there is little opportunity for forward planning. The flights for any particular day are finally decided between 0800 and 0930 on that day. Although normally both aircraft are flown on Tuesdays, Wednesdays and Thursdays, and only one on Fridays, Saturdays, Sundays and Mondays, the operation is flexible and one or even both aircraft may be cancelled according to the traffic offering. Users of the service accept this system, and other than in the case of priority flights are content within reason to fly when space is available.

At the time when application was made by the Falkland Islands Government for CAA advice on the operation of the Air Service, flying was confined to a five day week, no services other than mercy flights being carried out during the weekend. However, by the time the CAA team had arrived in Stanley, a rostering system of both pilots and ground engineering staff had been devised so that a seven day week service is now being provided with the existing staff. A solution to item (iii) of the team's terms of reference had therefore already been found.

3.1.6 The following order of flight priorities has been established:—

- ✓ 1st Priority — Medical Flights
- 2nd Priority — Delivery and Collection of overseas mail (letters only)
- 3rd Priority — Members of the Executive and Legislative Councils and Government officials travelling on duty
- 4th Priority — Ordinary passenger flights (any person in this category may apply to the Chief Secretary for a higher priority on compassionate or urgent business or other relevant grounds)
- 5th Priority — Freight and livestock. ✗

3.1.7 The procedure adopted for routing the aircraft on any particular day is simple but effective, and is aimed at coverage of the required destinations and overflying points in the case of mail dropping within the minimum flying distance. The system relies to a great extent on the long experience and familiarity with local conditions of both pilots operating the service.

Unless weather conditions are adverse flying normally commences at about 1000 hr. The Superintendent of Civil Aviation (or the second pilot should the former be off duty on that day) proceeds to the Air Service Office at 0800 hr and studies the weather chart and forecast produced by the Meteorological Office together with reports of actual conditions which are received during this pre-flight period from the various settlements which provide a weather reporting service. A decision is then taken as to whether the complete programme for which reservations have been made can be carried out. Conditions of cloud base, visibility and sea state may preclude landing at some destinations and part of the itinerary may have to be cancelled or postponed. Flying may be cancelled entirely should a high wind make launching of the aircraft hazardous, or should cloud base and visibility preclude the flights being carried out under Visual Flight Rules.

Route planning is carried out visually on a large scale chart of the Islands mounted on a wall of the Air Service office provided with pins marking the positions of the settlements. Two strings attached to the pin marking the Stanley base are marked off in approximate hours of flying; each string representing the flight path of one aircraft. Optimum routeing is determined by the simple expedient of passing the strings round the pins marking the intended points of call, and by trial and error arriving at a sequence resulting in the shortest flying time and an equitable division of work between the two aircraft. Due account is taken of the possibility of having to return to a particular settlement in the case of a medical flight when a doctor may require to be picked up after attending a patient. Long practice enables this apparently 'Heath Robinson' procedure to be carried out in a minimum of time and it has the advantage in that a visual presentation of the planned flight paths of the aircraft is available throughout the day. The markings on each string provide an indication of the fuel required and it becomes immediately evident whether the aircraft should be routed through either Saunders Island or Fox Bay where refuelling facilities are available.

On completion of flight planning the freight which has previously been delivered to the Air Service Office is divided according to the routes planned for each aircraft and a simple form of load sheet is prepared. The CAA team has some reservations both on the form of load sheet used and the manner in which they are prepared. Detailed comment and recommendations in this regard are made at Paragraph 4.6 later in the Report.

- 3.1.8 Overseas mail normally arrives at Stanley on Mondays by the weekly Argentine F.27 air service operated by Lineas Areas del Estado from Comodoro Rivadavia. On Tuesday of each week, or as soon thereafter as weather conditions permit, mail for the settlements is delivered by the Air Service. This operation entails an addition to the daily pre-flight procedure in that the pilots visit the Post Office to collect the mail where it has to be separated according to the routes previously planned for each aircraft. Letters and light packages are enclosed in small sandbags which, provided there is no other reason to land at the destinations to which they are addressed, are dropped from the aircraft from a height which ensures reasonable accuracy of delivery without endangering the safety of the aircraft or of persons or property on the ground. One of the CAA team flew with the Superintendent of Civil Aviation on a mail delivery when high wind and moderate turbulence at low level made flying for this purpose far from ideal, but found no reason to consider the operation in any way hazardous. Passengers in the aircraft appeared to accept the necessary low level manoeuvres with equanimity.

The dropping of articles from aircraft contravenes Article 32 of the Colonial Air Navigation Order, and Paragraph 5(1)(e) of Section 2 of the Twelfth Schedule to the Order prohibits flying closer than 500 ft to any person, vessel, vehicle or structure. A recommendation will be made later in the report that the Governor should take appropriate action under Article 79 of the Order to legalise the continued operation of this essential social service.

3.2 Communications

- 3.2.1 There are no VHF R/T Air/Ground communication facilities on the Islands, neither are the FIGAS aircraft so equipped. The frequency officially allocated for Air/Ground radio telephone communication is 5580 kHz in the HF band, but for some reason which the team were unable to ascertain it was reported that the airborne equipment on the Beaver aircraft does not operate satisfactorily on this frequency. Communication is therefore maintained on 4500 kHz which is the common frequency used by the outlying farms and settlements. Continuous watch is kept on this frequency by the Royal Marines, by the Posts and Telecommunications radio station during normal daylight working hours with the exception of a 30 min lunch time break, and by the FIGAS Stanley base during aircraft operations.

Position reports are passed by the pilots at intervals not exceeding 30 min should the airborne time between take-off and landing exceed this period. Normally calls are made on take-off from each settlement and an ETA is given for the next port of call so that no delay is experienced on landing waiting for personnel from the settlement to assist in handling the aircraft, cargo or passengers disembarking or joining the flight. While the communication system may be unorthodox the team saw no reason why it should not be continued as it ensures that the maximum number of persons are aware of the aircraft's position at all times. This could be of considerable value in case of emergency.

3.3 Meteorological Conditions and their Effect on the Service

- 3.3.1 Experience indicates that it is inadvisable to carry out routine passenger flights when the wind speed at the Stanley base is in excess of 20 kt, or similarly if such winds are reported from destinations in the Camp. The principal factors in arriving at this conclusion are the difficulty of launching aircraft from the ramp and of handling passengers and cargo at the settlements in high wind conditions. Emergency flights, generally at the request of the Senior Medical Officer, may be carried out in higher wind conditions, but are subject to approval by the Superintendent of Civil Aviation, and are not attempted if in his opinion the safety of the aircraft or its passengers may be endangered.
- 3.3.2 As there are no radio or other non-visual aids to navigation in the Colony, all flying is carried out in Visual Meteorological Conditions, that is to say clear of cloud and in sight of the surface. Should weather conditions deteriorate in flight, the pilots are instructed to abandon part or the whole of the remaining flight plan to ensure a safe return to Stanley in visual conditions, or should this not be possible, to land at the nearest safe anchorage to await improvement in the weather.

- 3.3.3 Statistics show that the height of the cloud base is on the average above 1000 ft during 55 per cent of the year and above 2000 ft during only 33 per cent of the year. Visibility however is better than 2 km on average during 96 per cent and better than 10 km during 84 per cent of the year.

The prevailing wind is westerly and 65 per cent of the winds blow from the quadrant South West to North West. Beaufort Scale Force 6 winds (22–27 kt) are experienced sometime during the day on an average of about 20 days per month throughout the year, and Force 8 winds of between 34 and 40 kt blow on an average of four days each month. However, the wind tends to be less strong in the early morning, rising to a peak around mid-day and diminishing again during the evening and night.

- 3.3.4 An average of between four and six flying days are lost each month due to adverse weather.

4 ACTION REQUIRED TO REGULARISE OPERATION OF FIGAS

4.1 Pilot Licencing

- 4.1.1 The pilots employed by the Air Service hold Commercial Pilots Licences (Flying Machines) issued by the Falkland Islands Colony Department of Civil Aviation. The licences were originally issued on the production of evidence of holding then current United Kingdom Commercial Pilots Licences, and are revalidated at six monthly intervals by the issue of a Certificate of Validity certifying that the holder was medically examined and was assessed as fit to act in the capacity stated in the licence. This procedure conforms with the requirements of the Colonial Air Navigation Order 1961.
- 4.1.2 The Colonial Air Navigation (Amendment) Order 1968 introduced major changes in pilot licensing by amendments to both Article 16 and to the Ninth Schedule to the 1961 Order. It is recommended that these changes, which by virtue of Article 1(3) of the Amendment Order do not come into operation until they are notified in the Gazette on a date appointed by the Governor, should be put into effect as far as is practicable.
- 4.1.3 The 1968 Amendment Order provides for the replacement of the old six month licence by a licence valid for five years. The five year licence is required to be supported by
- (a) A periodical medical examination – Article 16(2) proviso (c),
 - (b) A periodical Certificate of Test – Article 16(2) proviso (d) and the Ninth Schedule, Part C.
 - (c) An Instrument Rating in the following circumstances
 - (i) when the aircraft is flown within controlled airspace in Instrument Meteorological Conditions;
 - (ii) when the aircraft is flown on any scheduled journey;
 - (iii) when the aircraft is flown at night on a flight on which any passenger is carried;
 - (iv) when an aircraft of which the maximum total weight authorised exceeds 5000 lb is flown on any flight for the purpose of public transport, except a flight beginning and ending at the same aerodrome and not extending beyond 25 nm from the aerodrome.

- 4.1.4 (a) No difficulty is foreseen in meeting the requirement of sub-paragraph (a) of 4.1.3 above, as the Senior Medical Officer at Stanley is fully conversant with the examination procedures required for the issue and renewal of pilots licences, and the necessary equipment to carry out the examinations is available at the Hospital.
- (b) The Certificate of Test to which sub-paragraph (b) of 4.1.3 refers is required to be signed by a person authorised by the Governor for this purpose. The matters to be certified and the nature of the flying test are set out in Part C of the amended Ninth Schedule to the Order.

While it would be reasonable that the Superintendent of Civil Aviation should be authorised to sign Certificates of Test, a problem arises that he is also the Senior Pilot of the Air Service and is therefore required to undergo the same flying test. In view of the fact that only one type of aircraft is involved, on which both pilots have very considerable experience as pilot in command, it is recommended that rather than giving consideration to exempting the Senior Pilot from the requirement to hold a current Certificate of Test, it would be preferable for both pilots to be authorised by the Governor to sign these certificates. They could then test each other at appropriate intervals as prescribed in paragraph 9 of Part C of the Ninth Schedule to the Order.

- (c) The problem raised by the statutory requirement to hold and maintain an Instrument Rating necessitated in particular by sub-paragraph (c)(iv) of 4.1.3 above is more difficult, the only viable solution to which appears to be the grant of an exemption by the Governor. The Beaver aircraft has a maximum total authorised weight of 5090 lb, flights do not generally begin and end at the same aerodrome, and many of the sectors flown extend beyond 25 nm. However, the aircraft are not flown within controlled airspace, are not flown on scheduled journeys or by night, and all flying is carried out in Visual Meteorological Conditions.

The flight test prescribed for the issue and renewal of an Instrument Rating must be carried out in a multi-engined aeroplane, and the applicant is required to demonstrate ability to carry out let-down procedures using ground navigational and approach aids which are not available in the Colony. For these and other reasons it would not be possible to test the Air Service pilots at Stanley. The cost of sending the pilots to the United Kingdom or elsewhere for this purpose would be prohibitive.

The CAA team therefore recommend that, in consideration both of the operational restriction of the service to flight in Visual Meteorological Conditions and of the experience of the pilots on the routes flown, the Governor in exercise of his powers under Article 79 of the Order should exempt the pilots individually from the requirement to hold an Instrument Rating while flying Beaver aircraft of the Air Service.

4.2 Operators' Responsibility – Pilot Testing

- 4.2.1 Article 22(2) of the Order requires the operator of an aircraft registered in the Colony to satisfy himself that every member of the crew is competent to perform his duties, and in particular is competent to use the equipment provided in the aircraft for that purpose. The Article further requires a number of periodic tests to be carried out which are specified in the Tenth Schedule, Part B, to the Order.

- 4.2.2 It is clear that the tests prescribed in the Tenth Schedule are primarily directed towards the operational safety of modern multi-engined aircraft which may be flown in Instrument Meteorological Conditions over a wide route structure and normally carrying a crew of more than one pilot.

The team recognise that familiarity with emergency procedures, the use of emergency and life-saving equipment, seasonal meteorological conditions, knowledge of the routes flown and the aerodromes of take-off and landing together with other matters prescribed in this Schedule, are of paramount importance in the conduct of a safe operation. However, on consideration that

- (a) the 'Operator' of the Air Service is the Falkland Islands Government and one of the total of two pilots employed on flying duties by the operator is the Superintendent of Civil Aviation, and;
- (b) only one type of aircraft is used by the operator. This is a simple single-engined aircraft flown with a crew of one pilot only and both pilots employed by the Air Service are in constant current practice, and;
- (c) flights are not carried out in Instrument Meteorological Conditions, and;
- (d) the routes flown and 'aerodromes' of take-off and landing are restricted to those within the Colony and are well known by both pilots concerned, and;
- (e) the Air Service has enjoyed a very good record of safety over a considerable number of years,

the team recommend that the Governor should exempt FIGAS from the requirements of Article 22(2) of the Order insofar as it relates to the testing of pilots by the Operator and to the maintenance of records of such tests required by the Tenth Schedule Parts B1 (2) (5) and (6) and B2 to the Colonial Air Navigation Order, 1961.

- 4.2.3 Notwithstanding the exemption from the tests required by Parts B1 (2) (5) and (6) and B2 of the Tenth Schedule to the Order recommended in paragraph 4.2.2 above, it is considered necessary to retain the requirement that the pilots should be tested within the relevant period as to their knowledge of the use of the emergency and life saving equipment carried on the aircraft, and to have practised carrying out the duties required of them in case of an emergency occurring to the aircraft as required by Part B1 (1)(a) and (1)(b) of the Tenth Schedule. The tests and practices should be carried out by both pilots together, and the relevant period prescribed in Part B1 (6)(c) of the Schedule is twelve months.

4.3 Licensing of Maintenance Engineers

- 4.3.1 The maintenance hangar is staffed by two non-commissioned officers on secondment from the Royal Air Force, both holding the rank of Flight Sergeant. One is an airframe technician and the other a powerplant technician, but neither hold civil maintenance engineers licences. The engineers are supported by two locally recruited assistants who have some basic engineering experience.
- 4.3.2 Article 8 of the Colonial Air Navigation Order empowers the Governor to grant to any person a licence to act for the purposes of the Order as an aircraft maintenance engineer subject to being a fit and proper person to hold a licence, and further requires that the applicant should undergo such examinations and tests as the Governor may require of him. These examinations and tests are set and conducted in the United Kingdom by the Airworthiness Division of the Civil Aviation Authority. It would clearly be impracticable to arrange for the RAF engineers to be appropriately tested

for the issue of civil licences, but Articles 6(3)(c) and 7(3)(c) of the Order offer an acceptable alternative. These provisions permit Certificates of Maintenance and Certificates of Compliance required by the Order to be issued by a person approved by the Governor as being competent to issue such certificates.

4.3.3 The CAA team have no reason to question the competency of the persons concerned and have indeed received confirmation from the Ministry of Defence that they have undergone appropriate courses on the Beaver airframe and engine. It is therefore recommended that the Governor should officially authorise the RAF maintenance engineers to issue Certificates of Maintenance and Certificates of Compliance in respect of the de Havilland Beaver aircraft operated by the Falkland Islands Government Air Service.

4.3.4 Article 6 of the Order further requires that the radio station installed in an aircraft used for the purpose of public transport is maintained in accordance with a maintenance schedule approved by the Governor, and that a Certificate of Maintenance should be in force certifying that maintenance has been carried out in accordance with the schedule. The team found that there was no formal or regular arrangement for radio maintenance and recommends that a suitably experienced radio engineer should be appointed and authorised by the Governor to issue the appropriate Certificate of Maintenance.

4.4 Maintenance Schedules

4.4.1 The aircraft are currently maintained in accordance with the manufacturer's maintenance schedules for both the airframe and the powerplant. It is recommended that confirmation should be sought from the aircraft manufacturer that the schedules are up to date and take account of any modifications which may have been introduced since construction. The schedules should then be approved by the Governor as required by Article 6(1)(a) of the Order.

4.4.2 No maintenance schedule for the radio installation appears to exist. It is recommended that an appropriate schedule be compiled which could probably be verified by the Canadian Department of Transport by whom the original installation may have been approved. The maintenance schedule when compiled should also be approved by the Governor as required by Article 6(1)(a) of the Order.

4.5 The Operations Manual

4.5.1 Article 21 of the Colonial Air Navigation Order requires that the operator of every aircraft to which the Article applies shall

- (a) make available to each member of his operating staff an operations manual, and,
- (b) ensure that each copy of the operations manual is kept up to date and that one copy thereof is carried on each flight so as to be available to the members of the flight crew.

4.5.2 The operations manual is required to contain all such information and instructions as may be necessary to enable the operating staff to perform their duties, and is regarded as the corner stone of an effective operation. It provides a primary indication of the standards likely to be achieved by an operator. The form and scope of a manual will clearly vary with the size of the undertaking, but the basic principles remain the same even though, as is virtually the case with FIGAS, an operator may in effect be prescribing standards and procedures for himself.

- 4.5.3 The Tenth Schedule to the Order, which stems from Article 21 specifies in Part A the matters which should be included in the operations manual. Chapter 2 of CAP 360, 'Air Operators' Certificates – Information on requirements to be met by applicants and holders', provides guidance material on the manner in which both specific and general requirements relating to the operation of aircraft should be met.
- 4.5.4 While FIGAS has issued a list of Pilots' orders containing some of the material which would be included in an operations manual, no manual conforming to the requirement of Article 21 has been produced. It is therefore recommended that an operations manual following the guidance material contained in Chapter 2 of CAP 360 should be compiled and introduced at an early date. The Superintendent of Civil Aviation at Stanley has a copy of CAP 360.

4.6 Load Sheets and Technical Logs

- 4.6.1 Article 23 of the Order requires the operator to provide written instructions as to the manner in which the load carried on board an aircraft is distributed and secured. It is recommended that such instructions should be written.

The Article further requires that a load sheet is prepared in duplicate and is signed by both the person supervising the loading and the commander of the aircraft. In the case of FIGAS the commander himself supervises the loading so that only one signature is required. One copy of the load sheet should be carried in the aircraft and the other left on the ground on the occasion of each flight.

- 4.6.2 The form of load sheet currently used by the Air Service does not result in a true take-off weight or centre of gravity being established, nor is a copy of the load sheet left on the ground before each take-off. This question was discussed with the Superintendent of Civil Aviation and proposals were made which would bring the completion of load sheets and their distribution more in line with the statutory requirements. It was proposed that
- (a) a mean 'Aircraft Prepared for Service' weight should be calculated and entered on the load sheet. This weight would include full oil, the pilot and the emergency equipment;
 - (b) a number of standard loading plans should be devised to cater for various combinations of passengers, baggage, freight and mail, each of which would ensure that the centre of gravity falls within the prescribed limits for the aircraft. The designator of the loading plan used should be entered on the load sheet;
 - (c) a modified form of load sheet custom tailored for the Air Service type of operation should be devised on the lines of Appendix A. This should be completed in duplicate by the use of carbon paper or preferably by using a 'self-copying' backed paper for the top sheet. The top sheet would be perforated so that the appropriate portion could easily be torn off and left with someone on the ground at each stop. The load sheet suggested at Appendix A is combined with a technical log on which any defects in the aircraft and action taken in consequence are recorded. The requirements regarding technical logs are discussed at paragraph 4.6.4;
 - (d) while it is agreed that the notional weight of 180 lb used by the Air Service for both male and female passengers is a reasonable figure, the commander of the aircraft or the person supervising the loading should cause any passenger suspected of weighing more than 180 lb to be weighed before embarkation.

- 4.6.3 It is realised that the completion of a load sheet/technical log and the delivery thereof to a person on the ground in respect of each leg of a flight involving a number of brief transit stops during which the pilot may not leave the aircraft, may prove to be onerous or even impracticable. Nevertheless, a record of the load and any defects in the aircraft during flight could be invaluable in the case of an accident when the documents carried in the aircraft may well be lost, and it is therefore recommended that every effort to implement this procedure should be made.

If the procedure should prove to be entirely impracticable the team would be prepared, taking into account the nature of the operation and the uncritical loading characteristics of the Beaver aircraft, to recommend that an exemption from the relevant requirements of the Order should be granted by the Governor. This would entail an exemption from Articles 6(7) and 23(5) insofar as they relate to the requirement that a copy of the technical log and of the load sheet to be left on the ground.

- 4.6.4 The technical log to which reference is made in paragraph 4.6.2 is required by Article 6(5) of the Order. The requirement to carry this document on the aircraft and to keep a copy on the ground stems from Article 6(7), Article 51 and the Eleventh Schedule to the Order.

Although a record of defects and the corresponding certificates of maintenance and compliance upon rectification of defects are kept in the FIGAS hangar at Stanley, no technical log is currently carried in the aircraft or left on the ground at en-route stops. It is recommended that a practical solution to this omission would be achieved by adoption of the combined load sheet/technical log procedures suggested in the foregoing paragraphs, 4.6.2 and 4.6.3.

4.7 Carriage of Documents in Aircraft

- 4.7.1 Article 51(2) of the Order provides that an aircraft registered in the Colony shall, when in flight, carry documents in accordance with the Eleventh Schedule to the Order as amended by the 1965 Amendment Order. The Schedule requires seven documents to be carried by aircraft on flights for the purpose of public transport within the Colony, but the team recognises that no derogation of safety would result should these be reduced to three. These are Item D, the load sheet, Item F, the technical log and Item H, the operations manual.

- 4.7.2 It is therefore recommended that an exemption should be granted by the Governor to the effect that notwithstanding the documents required to be carried in an aircraft by Article 51(2) and the Eleventh Schedule to the Colonial Air Navigation Order 1961 as amended, Items D, F and H only are required to be carried by aircraft operated by FIGAS when engaged on flights within the Colony.

4.8 Licensing or Notification of Aerodromes

- 4.8.1 Article 59(1) of the Order requires that an aircraft engaged on a flight for the purpose of public transport of passengers shall not take-off or land at any place in the Colony other than
- (a) a Government aerodrome notified as available for the take-off and landing of aircraft so engaged, or in respect of which the person in charge of the aerodrome has given his permission for the particular aircraft to take-off or land, or

- (b) an aerodrome licensed under the Order for the take-off and landing of aircraft so engaged.

4.8.2 Aircraft of FIGAS take-off and land at the Stanley base and at areas of water adjacent to the settlements which they serve. Although these areas fall within the definition of aerodromes as interpreted by Article 81 of the Order, it is not considered necessary that they should be licensed as such. It is recommended that Stanley and all points within the Colony served by the Air Service should be notified as Government aerodromes available for take-off and landing by aircraft of FIGAS, in accordance with Article 59(1) of the Order.

4.9 Dropping of Mail

4.9.1 Reference was made at paragraph 3.1.8 of this report to measures required to legalise the dropping of mail by the Air Service. It is recommended that the Governor, in exercise of his powers under Article 79 of the Order should

- (a) exempt the pilots of FIGAS from the provisions of Article 32(2) of the Colonial Air Navigation Order 1961, as amended, insofar as they shall not apply to the dropping of mail from aircraft, and
- (b) exempt the aircraft from Article 56(1) of the Colonial Air Navigation Order 1961, as amended, insofar as paragraph 5(e) of Section 2 of the Twelfth Schedule to the Order shall not apply to aircraft of FIGAS while engaged on flights for the purpose of the dropping of mail.

4.10 Fatigue of Crew

4.10.1 The terms of reference of this study include

- (a) advice on the maximum weekly and daily flying hours and number of landings permissible for the pilots, and
- (b) advice on the level of staffing needed to permit flying to take place seven days per week.

Both these inter-related items are discussed under the main heading of this paragraph, and recommendations are made.

4.10.2 The Air Service has established no meaningful limits on flight times, flying duty periods or minimum rest periods other than those prescribed by Item 11 (Restrictions) in the Service's Pilots' Orders.

Article 45 of the Colonial Air Navigation Order (as amended in particular by the 1968 Amendment Order) requires the operator to establish limits on flying duty period and limits on the aggregate of flight times during every period of 28 consecutive days.

Paragraph (2) of Article 45 stresses the importance of taking into account in the establishment of these limits the nature of the work and the number of landings involved in any flying duty period. Further guidance material is contained in Chapter 2(4) of and Appendix D to CAP 360 to which document previous reference has been made in paragraphs 4.5.3 and 4.5.4 of this report.

The Air Service operation entails flying a relatively large number of very short stages with little time at cruising level. Strong and variable winds generally prevail, and at the low levels at which the aircraft are flown turbulence is frequently encountered. The single pilot operation in aircraft not equipped with an autopilot over rugged terrain in weather conditions more often than not far from ideal demands a continuous high level of concentration. Little or no relaxation is possible at the short transit stops where the work load is again continuous.

From observation on flights with both pilots the team concluded that a maximum limit of ten landings in any flying duty period should not be exceeded.

- 4.10.3 It is recommended that the following limits should be established, and that these limits should be included in the operations manual as required by Article 45(7) of the Order:
- (a) The scheduled flying duty period of a pilot should not exceed
 - (i) Ten hours in respect of a period during which the number of stages flown does not exceed four,
 - (ii) Nine hours in respect of a period during which five or six stages are flown.
 - (iii) Eight hours in respect of a period during which seven to ten stages are flown.
 - (b) The number of stages flown during any flying duty period should not exceed ten.
 - (c) The total number of hours flown in any period of 28 consecutive days should not exceed 80. It may be found necessary to reduce this figure in respect of the senior pilot of the Air Service to enable him to carry out his additional duties as Superintendent of Civil Aviation.
 - (d) A minimum period of 36 hours, including two nights, free of all duty in any seven day period should be established.
 - (e) Notwithstanding the above recommended limitations a discretion should be conferred upon the pilots to carry out a flight or flights in the special circumstances and subject to the conditions to which Article 45 (6) of the Order refers.

- 4.10.4 No difficulty is envisaged in rostering the two pilots and the technical staff to enable the Air Service, weather permitting to operate seven days per week. Arrangements to achieve this end had already been made prior to the arrival of the CAA team, and no reason was seen to change the present system.

Both aircraft are normally flown on Tuesday, Wednesday and Thursday subject to traffic demand and weather conditions, and one only is operated on Friday, Saturday, Sunday and Monday. This arrangement permits each pilot two days free of duty in every seven day period. The technical staff in the hangar are similarly rostered. Clerical staff do not work during the weekend so that any last minute reservations are dealt with by the pilot on duty.

- 4.10.5 The Senior Pilot, in his capacity as Superintendent of Civil Aviation attends the arrival and departure of the scheduled LADE service from Comodoro Rivadavia on Monday of each week. He is accompanied by a meteorological officer and local weather information is communicated by radio to the incoming aircraft. In the afternoon a forecast for the return flight to Argentina is provided. While there may well be some political or social justification for the Superintendent's presence at the Hookers Point airstrip during LADE movements it appeared that the airline personnel were perfectly capable of taking care of their own operation. The Superintendent would then be free for flying or administrative duties.

- 4.10.6 It was concluded that the present level of staffing is sufficient to permit the Air Service to fly seven days per week although no provision is made for leave or possible protracted sickness of pilots or maintenance engineers.

5 AMALGAMATION OF AVIATION, HARBOUR AND METEOROLOGICAL DEPARTMENTS

- 5.1 During their visit the CAA team held discussions with the Harbour Master who also acts as Collector of Customs and Agricultural Officer. The Senior Meteorological Officer was unfortunately away from the Colony, but the responsibilities and operation of the Department were discussed with his temporary relief.
- 5.2 For the purpose of this report it is not considered necessary to detail the technical and administrative duties of these officers, nor to expand upon the nature of the additional tasks which would devolve upon the Aviation Department should these three departments be amalgamated. While at the present time the Superintendent of Civil Aviation could take on the relatively minor administrative tasks involved in the supervision of the Meteorological Department, it was not demonstrated that this change would result in either economy or increased efficiency in weather reporting or the provision of weather forecasts.

It was understood that the harbour duties are in general infrequent and the demands on the Harbour Master's time are unpredictable. The existing combination of Harbour, Customs and Agricultural duties would appear to ensure that the officer concerned is fully occupied with a minimal risk of conflict between tasks.

While no merit is seen in amalgamation of the three departments at the present time, it may be wise to reconsider amalgamation of the Aviation and Meteorological Departments when the projected permanent airfield at Cape Pembroke is completed. In order to avoid duplication of both meteorological equipment and personnel it may then be reasonable to propose that the meteorological station should be moved to the airfield, and that the meteorological service should be operated under the aegis of a Director of Civil Aviation.

6 THE FUTURE OF THE AIR SERVICE

- 6.1 The Air Service was established in the 1950s primarily to meet the need for emergency medical treatment or evacuation, and this remains its primary purpose. Apart from a very small number of privately owned motor and sailing vessels, the service provides the only means of inter-island transport and its utilisation has shown a steady increase throughout the years. The inauguration of a regular air service between Stanley and Argentina is likely further to increase demand due both to improvement in the facility for Falkland Islanders to travel overseas and also to the possibility of an increase in tourism resulting from the greater accessibility of the Colony to the outside world. A continuing requirement for the Air Service as an essential social service is not in doubt in the foreseeable future.
- 6.2 The major effort of the CAA team during their brief visit was directed towards consideration of the operating procedures of FIGAS, and there was little opportunity to look into the economic aspects. However it was noted that the consultants Peat, Marwick and Mitchell reported in 1971 that the operating losses in 1970 subsidised by the Government amounted to £11 000 compared with a revenue of £16 000.

These figures appear to have substantially improved in subsequent years, and the 1973-4 Estimates for the Colony predict a revenue of £32 000 against a total expenditure of £34 782 which, if achieved, should entail a government subsidy of less than £3000. This prediction is presumably based on the introduction in July 1973 of a revised selective tariff by which fares are increased but which makes provision for a rebate on the mileage element in respect of persons normally resident in the Colony. Recent increases in fuel and oil prices have not been taken into account, and to what extent these will reflect in increased operating losses is not known.

- 6.3 The Air Service is equipped with two de Havilland Beaver II float planes, spares for which are guaranteed until 1977. Series production of this aircraft has now ceased, but they are still flown in considerable numbers particularly in Canada and North America. It is possible that spares could be obtainable from sources other than the original manufacturer beyond 1977.

The two FIGAS aircraft have flown approximately 4000 hr each in the past six years and appear to have been well maintained. The current rate of utilisation is about 500/600 hr per aircraft per year. Certain major structural components will eventually require replacement, the most significant of these being the struts at 8000 hr and the mainplane spars at 12 000 hr. There is no reason therefore why the aircraft should not be capable of continuing in service at least until 1977 and probably longer even should the possibility of increased utilisation up to say 1000 hr per aircraft per year be taken into account. Any significant increase in utilisation above the present level would require an extra pilot and possibly an increase in hangar staff.

- 6.4 No provision appears to have been made for eventual replacement of the existing aircraft, and it is unlikely that FIGAS will be able to generate an operating surplus sufficiently great to finance replacement. It is recommended that within the next two years the Government should (a) initiate enquiries as to whether major spares likely to be required for the Beaver aircraft will be obtainable beyond 1977 and whether their maintenance in service would be an economic proposition, and (b) decide upon a suitable aircraft to replace the Beavers when this action becomes necessary. In the formulation of this decision it is strongly recommended that priority should be given to consideration of float planes or seaplanes which have very definite advantages over landplanes for the type of operation in which little change is envisaged in the foreseeable future. Among the reasons for this are:

- (a) the siting of landing strips at many settlements would be a difficult task primarily because the generally strong and variable winds experienced in the area would necessitate provision of strips orientated in more than one direction;
- (b) light land-based aircraft are relatively sensitive to cross-wind both on landing and during ground manoeuvres. The number of occasions when flights would be impossible or unacceptably hazardous could be considerable;
- (c) due to soil conditions in the Islands where a preponderance of peat and clay is common, adequate drainage of the landing areas would be difficult, and surface water is likely to inhibit landplane operations during wet weather conditions;
- (d) the cost of preparation and maintenance of suitable landing areas could be expensive and may well be beyond the means of owners of the settlements. Fencing would probably be required to avoid incursions by sheep or other animals;

(e) water-based aircraft involve none of these problems, and have an added advantage that emergency alighting areas are generally available in event of engine failure or other contingencies necessitating a forced landing.

- 6.5 It is not possible to predict at this time the types of aircraft which may be available in 1977 or later as replacements for the Beaver, but the Civil Aviation Authority would be pleased to assist the Falkland Islands Government in this choice at the appropriate time.
- 6.6 The practicability of attracting a private aviation concern to the Colony to operate the Air Service would appear to be remote. In the absence of specific instructions no approach has been made to commercial firms either in the United Kingdom or elsewhere.

The size, nature of the operation, remote location and lack of opportunity for significant expansion of routes either within the Colony or to neighbouring territories offers little scope for profitability. It is believed that even should a private company be induced to take over the operation, it is probable that the majority of the personnel would be expatriates commanding higher salaries than those currently paid by FIGAS. The cost to the Falkland Islands Government might be expected to increase with little or no corresponding increase in effectiveness of the service. While operation of the service remains at or near its present level, it is considered that no advantage would result from the engagement of a private company.

7 MEDICAL ARRANGEMENTS FOR THE RENEWAL OF PILOTS' LICENCES

- 7.1 This final item in the team's terms of reference was briefly mentioned in paragraph 4.1.4(a). Discussions held with the Senior Medical Officer of the Colony revealed that FIGAS pilots are currently medically examined at six-monthly intervals to the standards prescribed in the Handbook for Civil Aviation Authorised Examiners. Facilities to examine to these standards are available at the Stanley Hospital with the exception of full audiogram equipment which is not considered to be of major importance.
- 7.2 Article 16, paragraphs 1, 2(c) and 6 of the Colonial Air Navigation Order 1961, as amended by the 1968 Amendment Order, requires the pilots to submit themselves to a medical examination 'upon such occasions as the Governor may require' and 'in such form as the Governor may require'. There is no record that either the frequency or the form of examination has ever been officially prescribed by the Governor. It is therefore recommended that the current practice should be formalised by the promulgation of an appropriate notice in the Gazette requiring pilots to be medically examined every six months to the standard required by the United Kingdom Civil Aviation Authority appropriate to the holder of a Commercial Pilots Licence.

8 CONCLUSIONS

8.1 Operational Procedures

- 8.1.1 Consideration of the operational procedures of the Falkland Islands Government Air Service indicated that while the operation is unorthodox and in a number of respects is technically in breach of the Colonial Air Navigation Order, 1961, it is safe and provides an essential social service.
- 8.1.2 No change in the present 'on demand' type of operation is recommended. It is considered that the introduction of a form of scheduling as suggested in the Peat, Marwick and Mitchell Report would result in inconvenience to users of the service, would not necessarily result in an increased load factor and would be unlikely to significantly reduce the operating costs.
- 8.1.3 Recommendations have been made throughout this report on action required by the Governor in respect of exemptions, authorisations and notifications under various articles of the Colonial Air Navigation Order 1961 with the object of ensuring that the operation of FIGAS is carried out in accordance with the provisions of the Order wherever this is practicable. These recommendations are summarised in paragraph 9.

8.2 Maximum Flying Hours and Number of Landings Permissible

- 8.2.1 No adequate measures are currently taken to guard against pilot fatigue.
- 8.2.2 The limits recommended in paragraph 4.10.3 should be established.

8.3 Operation on Seven Days per Week

- 8.3.1 It was concluded that the Air Service could operate on seven days per week with the present level of staffing.

8.4 Amalgamation of Aviation, Harbour and Meteorological Departments

- 8.4.1 It was concluded that amalgamation of the Aviation, Harbour and Meteorological Departments would serve no useful purpose at this time.

8.5 Future of FIGAS

- 8.5.1 It was concluded that the operation of the Air Service should continue in its present form.
- 8.5.2 It was considered that the existing de Havilland Beaver aircraft are capable of maintaining the service until and possibly beyond 1977.
- 8.5.3 Within the next two years consideration should be given to the need for replacement of the existing aircraft. The continued use of water based aircraft is strongly recommended.
- 8.5.4 No advantage is seen in attempting to engage a private company to operate the Air Service.

8.6 Arrangements for Medical Examination of Pilots

- 8.6.1 Existing arrangements for the periodic medical examinations of pilots is satisfactory, but should be formalised by the promulgation of appropriate requirements.
- 8.6.2 It is suggested that when the Senior Medical Officer is next in the United Kingdom he may care to contact Dr G Bennett, Chief Medical Officer of the Civil Aviation Authority with a view to taking advantage of a short course in aviation medicine. These courses, of one week's duration, are provided periodically for authorised CAA medical examiners.

9 RECOMMENDATIONS

- 9.1 An Operations Manual should be compiled and introduced at an early date.
Para 4.5
- 9.2 Limits on flying duty periods, maximum number of landings permissible within these periods and minimum rest periods should be established and included in the Operations Manual.
Para 4.10.3
- 9.3 A form of combined Load Sheet and Technical Log on the lines of Appendix 'A' should be introduced and the feasibility of its use as proposed in the report determined.
Para 4.6
- 9.4 It is recommended that the Governor should take the following action in exercise of the powers conferred upon him by the Colonial Air Navigation Order 1961, as amended, to ensure that the operation of FIGAS complies as far as is practicable with the provisions of the Order. Appropriate legal advice will be required on the precise wording of the proposed exemptions, authorisations and notifications.
- 9.4.1 By notice in the Gazette appoint a suitable date on which Articles 2(5)(a)(b)(d)(e)(f)(g) and (h) and 7 of the Colonial Air Navigation (Amendment) Order 1968 shall come into operation. This date will depend on the time required to have printed a new form of pilots licence as required by these Articles. The new Commercial Pilots Licences (Aeroplanes) should then be issued to the pilots concerned.
Para 4.1.2
- 9.4.2 Authorise both pilots of FIGAS to sign certificates of test as required by Part C.1 of the Ninth Schedule to the Order as amended by the 1968 Amendment Order.
Para 4.1.4(b)
- 9.4.3 Exempt the pilots of FIGAS from the provisions of Paragraph 2A of Part A of the Ninth Schedule to the Order insofar as they shall not be required to hold an Instrument rating when flying Beaver aircraft on flights for the purpose of Public transport.
Para 4.1.4(c)
- 9.4.4 Exempt FIGAS from the provisions of Article 22(2) of the Order insofar as it relates to the testing of pilots by the operator and to the maintenance of records of such tests required by Parts B.1 (2) (5) and (6) and B.2 of the Tenth Schedule to the Order.
Para 4.2
- 9.4.5 Both pilots of FIGAS should be required to test each other at twelve monthly intervals as to their knowledge of the use of the emergency equipment carried on board the aircraft, and at the same time should practise carrying out the duties required of them in case of an emergency occurring to the aircraft, as required by Part B1 (1)(a) and (1)(b) of the Tenth Schedule to the Order.
Para 4.2.3

- 9.4.6 Approve the maintenance engineers seconded from the RAF as persons competent to issue Certificates of Maintenance and Certificates of Compliance, as provided for in Articles 6(3)(c) and 7(3)(c) of the Order. *Para 4.3.3*
- 9.4.7 Appoint a suitably experienced radio engineer to carry out maintenance of the radio installations in the aircraft of FIGAS, and authorise him to issue Certificates of Maintenance in respect thereof as provided for in Article 6(3)(c) of the Order. *Para 4.3.4*
- 9.4.8 Approve the aircraft and radio maintenance schedules as required by Article 6(1)(a) of the Order. *Para 4.4.1/2*
- 9.4.9 Should the recommended load sheet/technical log procedure prove to be impracticable, exempt FIGAS from the provisions of Articles 6(7) and 23(5) of the Order insofar as they relate to the requirement that a copy of the load sheet and technical log should be left on the ground. *Para 4.6.3*
- 9.4.10 Exempt FIGAS from the provisions of Article 51(2) and the Eleventh Schedule to the Order insofar as the only documents required to be carried on the aircraft shall be the Load Sheet, the Technical Log and the Operations Manual. *Para 4.7.2*
- 9.4.11 Notify as government aerodromes available for take-off and landing all points served by aircraft of FIGAS in accordance with Article 59(1) of the Order. *Para 4.8.2*
- 9.4.12 Exempt the pilots of FIGAS from the provisions of Article 32(2) of the Order insofar as they shall not apply to the dropping of mail from aircraft. *Para 4.9.1(a)*
- 9.4.13 Exempt the aircraft of FIGAS from Article 56(1) of the Order insofar as Section 2, Paragraph 5(e) of the Twelfth Schedule to the Order shall not apply to the aircraft when engaged on flights for the purpose of the dropping of mail. *Para 4.9.1(b)*
- 9.4.14 Prescribe a requirement in accordance with the provisions of Article 16(1), (2)(c) and (b) of the Order that pilots shall be medically examined every six months to the standard required by the United Kingdom Civil Aviation Authority appropriate to the holder of a Commercial Pilots Licence (Aeroplanes). *Para 7.2*
- 9.5 Recommendations concerning items in the terms of reference other than the operational aspects of the Air Service are made in Paragraph 8 (Conclusions) of this report.

10 ACKNOWLEDGEMENTS

- 10.1 Captain Branson and Mr Jones wish to express their appreciation and thanks to His Excellency the Governor, the Acting Chief Secretary, the Superintendent of Civil Aviation, the Senior Medical Officer and to the people of the Falkland Islands for their guidance, advice, information and generous hospitality during the visit.

Civil Aviation Authority
Operational Services Overseas
June 1974

SPECIMEN TECHNICAL LOG AND LOAD SHEET

TECHNICAL LOG	Top sheet preferably NCR (No Carbon Required) Paper. Broken lines indicate tear-off perforations on top sheet only.									
From (D)										
To (E)										
LOAD SHEET	Flight No.		Date			VP FA		APS Wt.		
	FUEL		PAX		BAGS	CARGO	MAIL	AUW - C of G		
From (D)	Imp. Gals	Lb.	No.	lb.	lb.	lb.	lb.	lb.	lb.	Loading Plan
To (E)										
	Signature:									
TECHNICAL LOG	Dept.		Arr.				Time			
	DEFECT			ACTION			Signature and Licence			
From (C)										
To (D)										
	Signature of Commander:									
LOAD SHEET	Flight No.		Date			VP FA		APS Wt.		
	FUEL		PAX		BAGS	CARGO	MAIL	AUW - C of G		
From (C)	Imp. Gals.	Lb.	No.	lb.	lb.	lb.	lb.	lb.	lb.	Loading Plan
To (D)										
	Signature:									
TECHNICAL LOG	Dept.		Arr.				Time			
	DEFECT			ACTION			Signature and Licence			
From (B)										
To (C)										
	Signature of Commander:									
LOAD SHEET	Flight No.		Date			VP-FA		APS Wt.		
	FUEL		PAX		BAGS	CARGO	MAIL	AUW - C of G		
From (B)	Imp. Gals	Lb.	No.	lb.	lb.	lb.	lb.	lb.	lb.	Loading Plan
To (C)										
	Signature:									
TECHNICAL LOG	Dept.		Arr.				Time			
	DEFECT			ACTION			Signature and Licence			
From (A)										
To (B)										
	Signature of Commander:									
LOAD SHEET	Flight No.		Date			VP-FA		APS Wt.		
	FUEL		PAX		BAGS	CARGO	MAIL	AUW - C of G		
From (A)	Imp. Gals	Lb.	No.	lb.	lb.	lb.	lb.	lb.	lb.	Loading Plan
To (B)										
	Signature:									