Safety Regulation Group

Civil Aviation Authority

CAP 360

Air Operator's Certificates

Part Two - Arrangements for Maintenance Support

Information on requirements to be met by applicants and holders

www.caa.co.uk

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FOREWORD

1 PURPOSE

The purpose of this publication is to set out the maintenance support requirements to be met by Operators for the grant and continuation of an Air Operator's Certificate (AOC) or any subsequent variation to a Certificate. It should be read in conjunction with CAP 360, Part One (the 'Operational' counterpart of this document) and with the relevant parts of the Air Navigation Order (ANO), British Civil Airworthiness Requirements (BCAR) Civil Aircraft Airworthiness Information and Procedures (CAP 562) and Joint Aviation Requirement (JAR) 145.

2 APPLICABILITY

2.1 Operator certification and the associated requirements apply to a very wide range of activities, from short air taxi and pleasure flights to world-wide airline operations. In the statutory provisions few distinctions are drawn between small scale operations with light aircraft and major airline undertakings, for the basic principles of sound operating practice are essentially similar at all levels. But in the application of these principles, and of certification requirements, it is possible and it is necessary to take account of the scale and scope of the flying activity and of operators' particular circumstances. Operators may rest assured that the Civil Aviation Authority (CAA) and its inspecting staff are fully conscious of this and in dealing with certification matters will endeavour always to adopt as flexible an approach as is consistent with the maintenance of adequate standards. Small scale operators of light aircraft, balloons and airships etc should bear this particularly in mind in reading this publication.

NOTE: For the purpose of this publication the terms Operator is used to describe both applicants and certificate holders.

2.2 In this publication the word 'must' is used to indicate where the CAA expects the Operator to respond and adhere closely to the defined requirement. The word 'should' is used to indicate that the operator has a degree of latitude, particularly where the nature of the operation affects the degree of compliance. The use of 'should' must not, however, be taken to mean that nothing need be done. If the Operator's response is deemed to be inadequate by the CAA a specific requirement may be applied.

3 COMPLIANCE WITH STATUTORY REQUIREMENTS

3.1 The issue of a Certificate signifies only that the holder is considered 'competent to secure the safe operation' of his aircraft. It does not in any way relieve an operator or an aircraft commander of his responsibility for compliance with statutory requirements and for the safe conduct of a particular flight. International agreements and United Kingdom legislation are generally based on the concept that the ultimate responsibility for the safety of flight operations rests with the operator and the commander. The issue of a Certificate, and the work of the CAA in that connection, do not entail any departure from this general principle.

3.2 To a large extent the statutory requirements relating to the operation of aircraft are written in general terms. This is in accordance with the principle of 'operator's responsibility', and helps to facilitate the development of the operating standards and techniques best suited to particular circumstances and conditions. The competence of an operator to 'secure the safe operation' of his aircraft will therefore depend, in part, upon the manner in which he applies the statutory requirements of his particular operations. It is important, nevertheless, to appreciate that in the last resort the interpretation of the statutes is a function of the judiciary and that neither the issue of a Certificate nor the expression of any view in this publication should be taken as an indication to the contrary, or as a modification of any statutory requirements.

CHAPTER 1 – ADMINISTRATION

1 APPLYING FOR AN AIR OPERATOR'S CERTIFICATE (AOC) OR A VARIATION TO AN AOC

1.1 The initial application for grant of an AOC should be made to the CAA, Safety Regulation Group, Flight Operations Department* in accordance with CAP 360, Part One. A variation to the AOC will be required if a change is to be made in the type(s) of aircraft operated or if the geographical area of operation covered by the Certificate is to be modified. Application for a variation should also be made to the Flight Operations Department.

1.2 The Flight Operations Department, AOC Maintenance Office, must also be informed wherever a change is made:

(a) of the supporting maintenance organisation; note that a minimum of 28 days notice of the change is required;

(b) in the routes operated, where this involves changes to en-route maintenance arrangements;

(c) in the number of aircraft operated, where this affects the ability of the maintenance organisation to provide full support;

(d) in any of the details included in the CAA document AD 480A – Acceptance of Maintenance Support Arrangements (AD 480B in the case of a Balloon Operator).

1.3 The grant or variation of an AOC, or acceptance of any changes made to previously accepted arrangements, will be subject to a favourable assessment of the arrangements for maintenance specified in this Part Two of CAP 360.

1.3.1 Investigations will be undertaken by the Flight Operations Department and the Aircraft Maintenance Standards Department as necessary, according to the particular circumstances.

2 ACCEPTANCE

Notification that arrangements for maintenance support are acceptable will be by means of Form AD 480A, Acceptance of Maintenance Support Arrangements for Holders of Air Operator's Certificates, or Form AD 480B in the case of a Balloon. A Specimen document is included at Appendix A.

3 TEMPORARY MAINTENANCE BASES

Where it is desired to operate aircraft temporarily away from the normal operational base, at another base in the UK or overseas, the CAA may agree to maintenance being completed for a specified period at the places from which such operations are conducted.

*Safety Regulation Group, Flight Operations Department, Civil Aviation Authority, Aviation House, Gatwick Airport South, West Sussex RH6 0YR.

4 LEASING ARRANGEMENTS

4.1 Where an AOC holder intends to lease a foreign aircraft for his operation or to lease his aircraft for use outside the United Kingdom the maintenance arrangements can be complex and may involve a number of CAA departments in addition to foreign authorities and the Department of Transport.

4.2 Operators wishing to lease a foreign aircraft should contact SRG Flight Operations Policy and Standards Department Gatwick, at the earliest opportunity for further guidance.

NOTE: If an aircraft is to be operated overseas but not by the AOC holder application should be made to the Aircraft Maintenance Approvals Section, for approval of the maintenance arrangements during the period of the lease.

Chapter 1 APPENDIX A – AD480A

Civil Aviation Authority
Safety Regulation Group

AOC No.

ACCEPTANCE OF MAINTENANCE SUPPORT ARRANGEMENTS FOR HOLDERS OF AIR OPERATORS' CERTIFICATES

OPERATOR	SHOOFNER AIRLINES LTD T/A QUICKFIT AIRWAYS
AIRCRAFT TYPES	1. HS125 SERIES 800 2. HS748 SERIES 2 3. PIPER PA31 NAVAJO/CHIEFTAIN

No. 1 MAINTENANCE ORGANISATION

All maintenance requiring the issue of Certificates of Release to Service is to be completed under the control of:–

AIRCRAFT MAINTENANCE LTD
CAA APPROVAL REFERENCE AI/0123/98

No. 2 LOCATIONS

Scheduled Maintenance Inspections may be completed only at locations at which the Maintenance Organisation
is Approved by the CAA to perform such tasks, or as defined in the relevant Company Exposition. Additional locations require CAA acceptance in each case.

1. HS125 AT LONDON (GATWICK) ONLY

No. 3 LIMITATIONS

HS125 - AIRCRAFT REGISTRATION G-BQQQ
HS748 - CHECKS UP TO BUT NOT INCLUDING 'C' CHECK.

No. 4 MAINTENANCE

Maintenance is to be completed in accordance with the requirements of **CAA Approved Maintenance Schedule:**

Schedule Reference	*Aircraft Type*
MS/HS125/99	HS125 SERIES 800
MS/HS748/99	HS125 SERIES 2
MS/PIPER PA31/99	PA31SERIES

Date of acceptance

For the Civil Aviation Authority

Any changes to the arrangements defined in this document must be notified to the CAA as required in Special Condition B2 of the associated Air Operator's Certificate.

AD 480 A
210690

CHAPTER 2 – MAINTENANCE SUPPORT ARRANGEMENTS

1 GENERAL

1.1 It is the responsibility of the Operator to satisfy the Civil Aviation Authority, Safety Regulation Group, that his maintenance support arrangements are to a satisfactory standard. The Operator may have his own maintenance organisation or may contract-out his maintenance to another organisation acceptable to the CAA.

1.2 The Operator remains responsible for the safe operation of his aircraft when accomplishment of maintenance is contracted out and must therefore be satisfied with the standards of airworthiness achieved by the contractor. The Operator must monitor the contractor's response to the provisions of the maintenance agreement, employing such technical resources as are necessary to achieve this task.

1.3 Maintenance support arrangements will normally be based on an organisation approved by the JAA or CAA for the maintenance or overhaul of the type of aircraft concerned.

1.3.1 The support arrangements for aircraft of 13610 kg MTWA or more (being a type first certificated in the UK after 1st January 1972) must be based on an organisation approved by the CAA in accordance with BCAR, Chapter A8–13 or JAR–145.

1.3.2 The support arrangements for aircraft of 13610 kg MTWA or more (being a type first certificated in the UK before 1st January 1972) and for all aircraft of less than this weight may be based on an organisation:

(a) approved by the CAA in accordance with BCAR, Chapter A8–13 or Chapter A8–3 (B8–3) as appropriate (a company may hold both A8–13 and A8–3 approvals simultaneously), or JAR–145 or

(b) in which an acceptable number of appropriately Licensed Aircraft Maintenance Engineers (LAE) jointly perform the duties of a maintenance organisation.

NOTE: Where an approved organisation provides maintenance support for aircraft not listed in its terms of approval it will be considered by the CAA to be made up of a number of LAEs.

1.3.3 The maintenance of aircraft of less than 2730 kg MTWA may be accomplished by an organisation approved by the CAA in accordance with BCAR A8–3 or JAR–145 or by an organisation made up of licensed engineers or by an organisation approved by the CAA in accordance with BCAR A8–15.

1.3.4 If maintenance of such aircraft is not accomplished by an organisation approved by the CAA in accordance with BCAR A8–15 it must be remembered that aircraft must be presented to such an organisation for the renewal of Certificates of Airworthiness.

1.3.5 The maintenance of balloons must be under the control of an organisation appropriately approved by the CAA for this purpose. (See note below.)

1.3.6 The support arrangements for those airships which are subject to the Approval for Maintenance requirements of BCAR Chapter A8–18 or JAR–145 must be based on an organisation approved by the CAA in accordance with that requirement.

1.4 In considering the maintenance of aircraft, for the purpose of this document, maintenance is taken to include the overall control of airworthiness and the accomplishment of scheduled and unscheduled servicing and inspection tasks.

1.4.1 An organisation may be acceptable to the CAA for maintenance support without all of the necessary facilities to accomplish certain maintenance tasks provided contracted arrangements exist with a facility acceptable to the CAA.

1.5 All maintenance support organisations must have management systems to ensure effective support of the Operator's fleet of aircraft for which they have responsibility, over the whole of the routes operated. Quality Control and Assurance must be exercised as necessary to achieve satisfactory standards of continuing airworthiness.

NOTE: The British Balloon and Airship Club (BBAC) is approved by the CAA to certify the overhaul, repair, modification, replacement and inspection of balloons and to recommend the renewal of Certificates of Airworthiness. (The CAA will only accept such recommendations from an organisation approved for this purpose.)

2 CERTIFYING PERSONNEL – AUTHORISATIONS

NOTE: In the case of an aircraft maintained under the terms of a JAR–145 Approval personnel must be authorised in accordance with BCAR Chapter A8–13 Supplements 1 and 2 or with BCAR Chapter A8–3 as appropriate until JAR–65 becomes effective.

2.1 In the case of aircraft maintained under terms of a CAA Approval granted in accordance with the requirements of BCAR Chapter A8–13, personnel must be authorised in accordance with Supplement 2 to that Chapter.

2.1.1 Such authorisations are normally only granted to employees of the approved organisation, however, the authorisation of personnel employed by other organisations is also permitted, subject to the provisions of BCAR Chapter A8–13 Supplement 2:

(a) who are employed as full-time members of the staff by the Operator for whom the approved organisation is contracted to provide maintenance support for the purposes of an Air Operator's Certificate, or

(b) who are employed by another maintenance organisation holding CAA Approval for the type of aircraft concerned, for the purposes of completing defect rectification and line maintenance tasks only, provided there is a formal maintenance agreement between the two organisations, or

(c) who are employed overseas by a foreign organisation contracted to perform defect rectification and line maintenance tasks only, who comply with the requirements of paragraph 1.1 of Supplement 2 except that the CAA may accept an alternative to paragraph 1.1. (d) in a particular case.

NOTE: Provisions for the authorisation of personnel employed overseas, or under the terms of a CAA Secondary Authorisation, are contained in BCAR Chapter A8–13 paragraphs 1.3 and 5 respectively, where more detailed explanations of personnel authorisations and acceptable alternative qualifications are given. These provisions are amplified in Airworthiness Information Leaflet AD/1L/0145/1–5.

2.2 In the case of aircraft maintenance under the terms of a CAA Approval granted in accordance with the requirements of BCAR, Chapter A8–3, personnel should be authorised in accordance with the following requirements:

2.2.1 All staff, including holders of Aircraft Maintenance Engineer's licenses, who are required to issue Certificates of Maintenance Review and Certificates of Release to Service should be authorised in writing by the person nominated to do so under the approval.

2.2.2 Authorised persons should be provided with copies of their authorisations, preferably in card or booklet form, recording the following details:

(a) name of organisation,

(b) holder's name and signature,

(c) the JAA/CAA Approval reference number of the organisation and the holder's individual authorisation number,

(d) details of the aircraft, engines, systems, equipment and maintenance tasks for which authorisations have been granted, the scope of each authorisation and its date,

(e) a statement of any conditions of issue, including a statement to the effect that such authorisation is valid only so long as the holder is in the organisation's employment.

2.2.3 Personnel records should be kept, clearly indicating the basis upon which authorisations have been granted. The records should also include details of any Aircraft Maintenance Engineers' Licence or Aeronautical Engineering Certificate (Aeronautical Maintenance Certificate) held, training satisfactorily completed and the result of any written or oral assessment by the person responsible for granting the authorisation.

2.2.4 When personnel are temporarily employed under contractual arrangements, by an organisation holding BCAR, Chapter A8–3 or JAR–145 approval authorisations may not be granted under the terms of the approval. Where such personnel hold an Aircraft Maintenance Engineer's Licence issued by the CAA, however, the privileges of the licence may be exercised with the written agreement of the person responsible for granting authorisations in the approved organisation.

2.2.5 Personnel authorised under the terms of an approval granted in accordance with BCAR Chapter A8–3 should normally be directly employed by that organisation; however, it is acceptable for personnel to be authorised who conform to the conditions of paragraphs 2.1.1(a) or 2.1.1(b) above.

Arrangements to authorise personnel who are not employed by the organisation or who do not comply with paragraphs 2.1.1(a) or 2.1.1(b) should be discussed with the CAA, Aircraft Maintenance Standards Department (AMSD) Area Office in the first instance. Any subsequent approvals will be authorised or granted by the AMSD, Maintenance Approvals Section.

2.3 Organisations approved by the CAA in accordance with BCAR, Chapter A8–15, and unapproved organisations are not able to authorise personnel. All certifications must be made by appropriately licensed engineers.

2.4 Inspectors authorised by the British Balloon and Airship Club (BBAC) may issue Certificates of Maintenance Review (CMR) and Certificates of Release to Service (CRS) as specifically defined in their individual terms of reference and responsibilities.

3 SCHEDULED MAINTENANCE INSPECTIONS

3.1 JAA/CAA approval of aircraft maintenance or overhaul organisations normally refers to one address shown on the Approval Certificate as the address where work will be undertaken within the terms of the approval. This location is usually the main base of the organisation. Additional subsidiary bases may exist, where suitable facilities and a supporting maintenance control organisation are provided, which may be added to the JAA/CAA Approval after investigation. Scheduled Maintenance Inspections (SMI) are normally accomplished at such approved locations.

3.2 The Approval Certificate in which JAA/CAA approval is defined also permits maintenance tasks to be accomplished at other locations as shown in the company's Exposition. This is intended to take account of minor locations which may be classed as either a base, or a line maintenance station at which Scheduled Maintenance Inspections take place.

3.3 Supporting maintenance organisations must ensure that Expositions, or a related document such as a Line Maintenance Manual, include details of the facilities, procedures, organisation and scope of work to be accomplished at each location where Scheduled Maintenance Inspections take place.

4 STAFF NUMBERS

4.1 The organisation providing maintenance support must satisfy the CAA that it has a sufficient number of staff, including qualified maintenance personnel, to meet the demands which will be placed upon it. Support appropriate to the route pattern, transit frequency and maintenance requirements of the Operator must be provided at main bases and route stations.

4.2 The CAA will require assurance that shift duty periods are adequately staffed and will effectively enable scheduled and unscheduled tasks to be performed. Particular attention should be paid to ensuring that adequate staff are available to perform tasks of airworthiness significance in a proper manner. Company policies in respect of maintenance personnel duty periods should be made known to the CAA.

4.3 The licensed and authorised personnel employed by the maintenance support organisation must be appropriately qualified to perform the tasks required, including the issue of Certificates of Maintenance Review and of Certificates of Release to Service for Scheduled Maintenance Inspections and the rectification of defects.

5 TRAINING

5.1 Maintenance organisations must have a programme of training to ensure that:

(a) All maintenance personnel are adequately trained to perform the duties required of them;

(b) Personnel required to issue Certificates of Maintenance Review and Certificate of Release to Service receive familiarisation training on the aircraft type and instruction in the correct operation of the Operator's airworthiness control procedures to enable them to perform these tasks on the type of aircraft for which support is being provided;

NOTE: Requirements for the training of persons engaged in the maintenance of aircraft in accordance with the requirements of BCAR Chapters A8–13 and A8–18 are published in those Chapters.

(c) persons contracted to perform line maintenance tasks through maintenance agreements or Secondary Authorisations are trained in any significant differences which exist between the Operator's aircraft and that which they are normally employed to maintain together with any relevant company procedures they are required to observe;

(d) personnel engaged in maintenance-related tasks receive refresher training at regular intervals covering any changes to the aircraft and its maintenance, taking into account the results of in-service experience gained by the Operator and that published by the aircraft, engine and equipment manufacturers. Attention should also be paid to changes in company procedures, the ANO and JAA/CAA requirements.

5.2 Records should be maintained of all training undertaken by personnel including any results of assessments or examinations.

5.3 Training must include formal instruction and practical experience.

5.4 Management, Quality Assurance and other relevant personnel should be trained in the techniques of maintenance management and the achievement of airworthiness appropriate to the posts held.

5.5 The number of maintenance personnel, including management, supervisors, quality audit staff and mechanics to be trained before the introduction into service of a new type of aircraft should be agreed with the CAA. Numbers should take into account the complexity of the aircraft and its systems, the fleet size, the anticipated pattern of aircraft utilisation and the organisation's previous experience of similar aircraft.

6 TEMPORARY MAINTENANCE BASES

6.1 When an Operator informs the CAA that he proposes to operate and control the maintenance of an aircraft temporarily away from the normal operating base, at another self-contained base in the UK or overseas, the CAA may agree to maintenance being completed for a specified period at the place from which such operations are conducted, without amendment of the company Approval or Exposition.

6.2 Application should be made to AOC Maintenance Office, for approval of the arrangements. Depending on the nature and duration of the operation the CAA may require submission either of a full description of the arrangements in the form of a report or of CAA Form AD 970 – AOC, Temporary Aircraft Maintenance Base.

6.2.1 The CAA would prefer, wherever possible, that the arrangements are described and submitted in the form of an entry in the Operator's Line Maintenance Manual, or other line maintenance instruction, thereby ensuring that maintenance personnel are fully acquainted with the arrangements and their individual responsibilities.

6.2.2 Where AD 970 is considered to be a suitable method of application for approval copies of the form will be provided by the CAA. A specimen is shown at Appendix A to this chapter.

Chapter 2 APPENDIX A – AD 970

Civil Aviation Authority

Safety Regulation Group

AIR OPERATOR'S CERTIFICATE — TEMPORARY AIRCRAFT MAINTENANCE BASE†

1 GENERAL

(a) Name of Operator .....

(b) Name of Station .....

(c) Address of Station .....

.....

..... Telephone No. .....

(d) Organisation responsible for maintenance:

Aircraft/Engine .....

Other .....

(e) Designation and frequency of maintenance checks to be completed .....

.....

.....

(f) How many aircraft is it anticipated will use this base:

No. ..... Type ..... Utilisation per month

No. ..... Type ..... Utilisation per month

(g) Maintenance will be carried out under supervision of:

LAE'S	*Yes/No
Authorisation/Approval	*Yes/No

2 STAFF

(a) Persons in charge: Aircraft/Engine ..... Other .....

Responsible for Engineering to .....

(b) Total Engineering Staff .....

(c) Qualified staff, as below:—

Name	Licences and/or Authorisations	

NOTE If insufficient space available use *Remarks* section at end.

† Where it is desired to operate aircraft temporarily away from the normal operational base, at another base in the UK or overseas, the CAA may agree to maintenance being completed for a specified period at the places from which such operations are conducted. This application, stating the facilities and support available at such places, should be submitted to the CAA, Safety Regulation Group. Acceptance will be notified by letter.

* Delete as applicable

AD 970
230888

Chapter 2 APPENDIX A (cont'd)

3 FACILITIES (EQUIPMENT)

(a) Is the size of the hangar adequate considering the types and the amount of work to be carried out? *Yes/No

(b) Are there adequate stands, steps, docking etc. to carry out maintenance, defect rectification and normal servicing? *Yes/No

(c) Are adequate workshops available? *Yes/No

State what shops .....

.....

(d) Are facilities available for completing battery charging and capacity checks? *Yes/No

(e) Are there facilities available for testing systems and equipment? *Yes/No

State which .....

.....

(f) Is any work to be undertaken in the Open? *Yes/No

State tasks to be completed .....

.....

Is working accommodation, heating and lighting adequate? *Yes/No

(g) Is any provision made for the repair of cargo containers and cargo retention equipment? *Yes/No

(h) Are all the tools and test equipment required for work to be completed available? *Yes/No

or are they supplied from: .....

(i) Have the LAE's/certifying engineers been given adequate terms of reference? *Yes/No

(j) Are there adequate engineering staff to carry out the planned work at this base? *Yes/No

(k) *Additional Support Arrangements*

for (i) Staff are available from .....

(ii) Equipment .....

(iii) NDT and other test facilities .....

4 STORES

(a) Is there an adequate quarantine stores? *Yes/No

(b) Is there an adequate bonded stores? *Yes/No

(c) The person responsible for the stores and related records is: .....

(d) Are there separate stores for flammable materials, oils and greases etc? *Yes/No

(e) Identification of parts in stores is by .....
(i.e. batch number, App. Certificate No.)

(f) Items with shelf life are controlled by: .....

(g) Where are spares obtained from? .....

(h) All spare engines are labelled showing date of inhibiting, where applicable and any component 'robbery'. *Yes/No

Delete as applicable

Chapter 2 APPENDIX A (cont'd)

5 TECHNICAL INFORMATION AND PROCEDURES

(a) Are relevant maintenance manuals available? (paper/film/fiche)* *Yes/No

(b) Are applicable company maintenance instructions, Engineering or QC Notices etc held relevant to the aircraft maintained? *Yes/No

(c) Will all or part of the Company Exposition/Engineering Manual be available on-site? *Yes/No

(d) Are maintenance schedule worksheets available relevant to the checks to be completed? *Yes/No

(e) Are service bulletins, newsletters, etc. available? *Yes/No

(f) Are copies of ANO's*, BCAR Section A*, Airworthiness Notices, CAP 360 Pt 2 and other relevant publications available? *Yes/No

(g) On completion of worksheets, these are filed

(i) at this base *Yes/No

or

(ii) forwarded to: .....

(h) Are history cards in use for every aircraft, and held at this base (alternatively state below how lifed components/tasks are controlled): *Yes/No

(i) Duplicate copies of the technical log are removed and filed at: .....

(j) Are deferred defects controlled locally, transmitted to main base daily or both? State which: .....

(k) Are defects monitored for repetition? *Yes/No

(l) Are all defect records forwarded to main base? *Yes/No

(m) Are copies of log book entries forwarded to main base? *Yes/No

(n) Are publications and forms adequately controlled and amended to date? *Yes/No

6 SUPERVISION AND PERIODIC CHECKS

(a) Is all test and servicing equipment checked periodically and recorded? *Yes/No

(b) Are refuelling installations checked regularly for water? *Yes/No

(c) Will quality surveillance checks be made on the base by the Chief Engineer/ Quality Manager or their representative at intervals to ensure that company requirements and standards are being met? *Yes/No
(State interval of routine checks months)

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**Delete as applicable*

Chapter 2 APPENDIX A (cont'd)

RECOMMENDATION

The maintenance and engineering support arrangements made for the operation of the above aircraft are to a satisfactory standard and all relevant company procedures will be applied to this base.

Signed .....
*(Technical Director/Chief Engineer/Quality Manager)

of: .....

Date .....

Approval No. .....

**Delete as applicable*

REMARKS .....

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CHAPTER 3 – CONTRACTING-OUT MAINTENANCE

1 GENERAL

1.1 The management and accomplishment of engineering support may be achieved by the Operator using his own or an associated maintenance organisation. Alternatively all or part of the arrangements may be contracted to a separate organisation.

1.1.1 Contracted arrangements for engineering support and maintenance do not absolve the Operator from the overall responsibility for ensuring the safe operation and continuing airworthiness of the aircraft.

1.2 Where the Operator does not maintain the aircraft he operates using only his own resources, full details of the division of responsibilities between the Operator and the contracted maintenance organisation must be included in an agreement between the two parties. Matters to be addressed in such an agreement are contained at Appendix A.

1.3 Where an Operator contracts-out part or all of the maintenance to a separate organisation, he must nominate a person for engineering liaison purposes. This person will be responsible to the Operator; for planning the timely presentation of the aircraft to the engineering support organisation for all contracted maintenance; for liaison on all matters relating to the maintenance contract or agreement and for airworthiness matters affecting the safe operation of the aircraft. Where the Operator has several types of aircraft a different person may be nominated for each fleet.

1.3.1 The Operator's representative(s) should visit the contracted maintenance organisation at the inception of the agreement, and periodically thereafter, to ensure that the standards agreed are being maintained. Reports of all such visits should be kept and made available to the CAA on request.

1.4 An arrangement whereby more than one maintenance organisation is contracted by an Operator in respect of the airworthiness control of a particular aircraft type will not normally be acceptable to the CAA, other than for maintenance support at route stations or where a distinct division of aircraft is established e.g. different maintenance schedules apply.

1.5 An Operator may only arrange separately for the maintenance, overhaul and repair of engines or other components with the knowledge and agreement of his principal maintenance contractor.

1.5.1 In order to be able to discharge his responsibilities for continued airworthiness and to issue Certificates of Maintenance Review (CMR) the contractor must satisfy himself on a continuing basis that the requirements of the approved maintenance schedule are being complied with, including condition monitoring and reliability reporting, and be made aware of any significant performance trends.

1.5.2 Responsibilities for the assessment and incorporation of manufacturer's Service Information and for compliance with mandatory requirements must be clearly defined in the agreement.

1.6 In its assessment of the overall engineering support arrangements provided by the Operator, the CAA will require to examine and may require to hold copies of all agreements, including sideletters and addenda, between the parties concerned.

1.7 Any proposal to change the maintenance arrangements, e.g. a change to another maintenance organisation or significant organisational, procedural or technical change to a maintenance agreement, must be notified to the CAA at least 28 days prior to the proposed date of implementation.

1.8 Arrangements other than in accordance with this chapter will need to be specifically agreed with the CAA.

2 CONTRACTING-OUT FULL SUPPORT

2.1 The operator may contract full maintenance support to an organisation approved by the JAA/CAA for the maintenance or overhaul of the type(s) of aircraft concerned. In certain circumstances e.g. aircraft below 5700 kg MTWA, and where specifically agreed above that weight, the CAA will accept the provision of maintenance support by an un-approved organisation employing appropriately Licensed Aircraft Maintenance Engineers.

2.2 The Operator must ensure that the maintenance organisation competently discharges its responsibilities under the agreement, to his satisfaction, and is responsible for satisfying the CAA that the organisation meets the requirements of this CAP 360, Part 2, insofar as they relate to the contracted work.

2.3 Written agreements should clearly define what responsibility for action is allowed to the maintenance organisation without prior consultation, and what tasks require agreement by the Operator.

2.4 Whenever an aircraft is presented for scheduled or unscheduled maintenance it is essential that a precise indication is given of the inspections required, all defects known to exist on the aircraft plus any additional work required to be carried out (after consultation with the maintenance organisation as necessary).

NOTE: Operators must appreciate that a maintenance organisation cannot carry out work or certify inspections without their instructions or agreement and it follows that they should be quite specific when making known their work requirements to the organisation of their choice. Difficulties regularly occur because there is a misunderstanding between customer and maintenance organisation as to the former's requirements.

2.5 Where maintenance arrangements are based on Licensed Aircraft Maintenance Engineers the CAA will assess the organisation's ability to accomplish the contracted maintenance support. The CAA will take into account the management systems, organisational structure, staff numbers and qualifications, quality control, quality assurance and work planning practices applied by the organisation both at main base and to support the operation en-route or at line stations. The CAA will require the nomination of a person, whose experience and qualifications are acceptable to the Authority, to act as the Chief Engineer and to accomplish liaison between the organisation, the Operator and with the CAA.

2.6 The accomplishment and certification of maintenance for aircraft not exceeding 2730 kg MTWA is defined in the respective approved maintenance schedule for that aircraft (e.g. CAP 411 – Schedule reference CAA/LAMS/FW/1978 or CAP 412 – Schedule reference CAA/LAMS/H/1978).

2.6.1 Although the provisions of the approved maintenance schedule allow maintenance checks to be carried out and certified in various ways the CAA requires, for AOC support purposes, that one organisation is nominated by the Operator to perform the tasks of overall Airworthiness Control. It is expected that this organisation will be the Operator's principal maintenance contractor.

2.6.2 In exercising its responsibilities for the overall management and control of maintenance the contracted maintenance organisation must be satisfied with the completion and certification of all tasks performed by the Operator during line maintenance or by other organisations/engineers.

3 CONTRACTING-OUT LINE MAINTENANCE SUPPORT

3.1 Line maintenance is defined as those maintenance activities required to prepare an aircraft for flight including:
Preflight inspections and servicing,
Daily inspections,
Minor scheduled maintenance not requiring input to main base,
Defect rectification.

3.2 A written agreement should exist between the Operator or his principal contracted maintenance organisation and the organisation contracted for the performance of line maintenance, detailing the tasks to be performed on behalf of the Operator.

The arrangements must be defined in company instructions so that responsibilities, procedures and communication paths are made clear to all concerned.

3.3 The authorisation of maintenance personnel employed by the line maintenance contractor must conform to any requirements and limitations imposed by the conditions of JAA/CAA Approval held by the Operator or his principal maintenance contractor as appropriate.

3.4 It is the responsibility of the Operator or his principal maintenance contractor to ensure that the continuing performance of the line maintenance contractor is such as to ensure safe operation of the Operator's aircraft.

4 CONTRACTING-OUT GROUND HANDLING

4.1 Operators may enter into Ground Handling Agreements with other operators or organisations for the provision of services associated with aircraft arrival, turnround and dispatch. In these cases a written agreement should exist detailing the tasks to be performed on behalf of the Operator.

4.2 Where appropriate the IATA Standard Ground Handling Agreement AHM 810 provides an acceptable basis for an agreement; however, it is essential that maintenance or flight crew personnel responsible for accepting the aircraft for flight are made aware of any matter which is not included in the agreement at that station.

4.3 It is the responsibility of the Operator or his principal maintenance contractor to ensure that the continuing performance of the ground handling contractor is such as to ensure safe operation of the Operator's aircraft, and that necessary training has been performed.

5 CONTRACTING-OUT TO FOREIGN MAINTENANCE ORGANISATIONS

5.1 Maintenance support may only be contracted to a foreign organisation if it is appropriately approved by the JAA, or CAA, or by the responsible authority of the organisation. Where the organisation is JAA/CAA approved the normal requirements of CAP 360, Part Two will apply. The CAA will not normally accept the contracting-out of full support to a foreign maintenance organisation unless that organisation holds JAA/CAA Approval for the particular aircraft.

5.2 If the organisation does not hold JAA/CAA Approval the following conditions will apply.

5.2.1 The maintenance organisation or operator in question must be approved by its responsible authority.

5.2.2 The national airworthiness standard under which the maintenance organisation has been approved will have to be known by the CAA to be comparable with JAA/CAA standards.

5.2.3 The arrangements must provide for the CAA to be allowed to inspect, upon notification, the facilities at any of the nominated locations.

5.2.4 Details of the proposed maintenance arrangements must be acceptable to the CAA.

5.2.5 A formal maintenance agreement in accordance with this Chapter must be established, appropriate to the tasks being undertaken. Such an agreement should aim to ensure an airworthiness standard comparable with JAA/CAA requirements, paying particular attention to the following:

(a) That the method of certifying individual maintenance tasks and the responsibilities of nominated signatories ensure that the authority given to the signatories and the nature of the work they certify provide equivalence to JAA/CAA certification. The signatories must be persons employed by the foreign maintenance organisation.

(b) That all work is completed and certified in accordance with the maintenance organisation or Operator's approved technical procedures.

(c) That the work undertaken is within the scope of the approval of the organisation granted by the Responsible Authority.

(d) That all applicable UK Operator/maintenance organisations' procedures or requirements are covered, e.g. duplicate inspections, fuel flow tests, flight tests, compass swings etc.

(e) That necessary maintenance manuals or equivalent technical literature are provided and worked to, except for authorised deviations.

(f) That all replacement parts for the specific aircraft are appropriately certified and are to a satisfactory standard, in particular replacements for any system or component which may have been the subject of UK Special Conditions or additional requirements prior to certification in the United Kingdom.

NOTES: 1 These provisions do not obviate the need for a Certificate of Maintenance Review, and a Certificate of Release to Service on completion of scheduled maintenance inspections, issued in accordance with the provisions of the Air Navigation Order.

2 The CAA will assess the qualification standards achieved by the contracted organisation when granting personnel authorisations.

6 CONTRACTING-OUT ENGINE MAINTENANCE

6.1 When an Operator chooses to contract-out maintenance of engines independently from the overall arrangements existing for maintenance support of the aircraft, it is essential that the primary maintenance contractor:

(a) Is fully in agreement with the proposed arrangements and

(b) is kept continuously aware of engine condition monitoring and any adverse trends in reliability or performance which arise, if he is not directly a party to such monitoring,

(c) is made aware of the status of engines fitted to aircraft in respect of modifications, service bulletins and airworthiness directives,

(d) liaises with the engine maintenance contractor in respect of the requirements of the approved maintenance schedule for the aircraft so that the engine maintenance reflects the needs of the aircraft for airworthiness.

6.2 At all times the liaison between the aircraft and engine maintenance organisations must be such as to enable the appropriately authorised person to carry out maintenance reviews and issue the required certificate (CMR) and safely discharge his statutory responsibilities when doing so.

Chapter 3 APPENDIX A – MAINTENANCE AGREEMENT

1 Where an Operator chooses to contract maintenance to another organisation, a written agreement must be drawn up indicating the divisions of responsibility between the two parties for the overall support of the aircraft and for compliance with statutory regulations and other relevant requirements.

2 The purpose of the agreement is to demonstrate a firm commitment by the two parties to the maintenance support of the aircraft in the operation for which application has been made for an Air Operator's Certificate.

3 It is strongly recommended that the parts of the agreement dealing with maintenance are sub-divided into those tasks to be accomplished by the contractor and those tasks which will remain the responsibility of the Operator. This is particularly necessary where, for example, the Operator retains responsibility for line maintenance or spares provision.

4 The agreement should address the following matters:

(a) *general arrangements* for support of the operation by the maintenance organisation, and for technical liaison between Operator and Maintenance Organisation,

(b) *accomplishment of maintenance* at the approved locations of the maintenance organisation,

(c) *provision of appropriately authorised/licensed maintenance personnel* sufficient in numbers for the completion and certification of scheduled maintenance, the rectification of defects and the completion of duplicate inspections,

(d) *training of maintenance personnel* and, where necessary, the Operator's flight crews,

(e) *arrangements for line maintenance and ground handling* at the Operator's route stations, including major unscheduled arisings such as engine changes and defects requiring major dismantling or jacking,

(f) *control and development of the Maintenance Schedule* in response to service experience and manufacturers recommendations, the management and operation of reliability programmes, the preparation of documentation needed to implement the schedule and the arrangements for granting variations to the maintenance schedule requirements,

(g) *airworthiness occurrence control* and reporting to the manufacturer and the CAA, including MOR, and the control of *deferred and repetitive defects,*

(h) *maintaining logbooks,* component service history, maintenance and other technical records and the transmission of Sector Record page information from the Operator to the maintenance organisation,

(i) *manufacturer's Service Bulletins/Information* received, assessed and incorporated into modifications and manufacturer's technical programmes,

Chapter 3 APPENDIX A (cont'd)

(j) *compliance with mandatory requirements* including mandatory modifications and inspections, and Airworthiness Directives, and for responding to other maintenance and airworthiness requirements published by the Responsible Authorities,

(k) *provision of spares, their storage and acceptance,*

(l) *ensuring the availability of the necessary tools and equipment* to complete the scheduled maintenance and any other work arising under the terms of the agreement,

(m) *provision of suitable maintenance accommodation* at all locations where maintenance takes place, appropriate to the task,

(n) *quality auditing of the maintenance arrangements,* including in particular the systems and procedures employed to achieve the control of airworthiness, at main base, line stations and en-route wherever support and ground handling takes place.

5 Details of the financial aspects of maintenance agreements may be omitted.

6 A copy of the signed agreement must be sent to the AOC Maintenance Office. Access must be given to any side-letters or sub-contracted arrangements for the provision of special services such as radio, avionics, NDI etc., or for any other support including that provided at line stations. Copies of such additional arrangements may be required.

CHAPTER 4 – AIRWORTHINESS CONTROL PROCEDURES

1 GENERAL

Procedures described in company manuals and/or required to be provided by this publication must be published in company documents and made available to staff concerned as necessary to ensure that they are aware of the procedures and their own resultant duties and responsibilities.

2 MAINTENANCE SCHEDULES – CONTROL AND DEVELOPMENT

2.1 Two copies of the proposed Maintenance Schedule must be prepared and submitted for approval to the CAA, Safety Regulation Group, Aircraft Maintenance Approvals Section. When the schedule is approved the applicant will be formally notified by means of a Maintenance Schedule Approval Document, AD 271, which also defines the frequency and conditions for issue of Certificates of Maintenance Review and Release to Service for Scheduled Maintenance Inspections (SMI).

NOTE: CAA Document No.452, Approval of Maintenance Schedules, gives guidance in respect of the preparation and submission of schedules for CAA approval.

2.2 Procedures must ensure that the data contained in an approved schedule is reviewed periodically, e.g. at minimum intervals of six months, with the object of ensuring that the detailed schedule requirements continue to have practical applicability in the light of experience and adequately meet the maintenance needs of the aircraft if continuing airworthiness in the respective operating circumstances is to be ensured.

2.3 Reviews must take account of variations from the original certification standard of the aircraft which may have occurred as a result of modifications and respond to the recommendations of the manufacturer contained in maintenance manuals and Service Bulletins.

2.4 Changes in the use of aircraft may affect the conditions for approval of the maintenance schedule, for example with respect to annual utilisation, average flight duration and operating environment. Amendments to schedules and to engine maintenance programmes must be submitted for approval in response to significant changes.

2.5 A continuous analysis must be undertaken of defects arising on the aircraft during flight and at maintenance inputs, from Technical Logs and from worksheets raised during Scheduled Maintenance Inspections, particularly those where major structural inspections are undertaken. Results of the analysis must be used to amend the maintenance schedule as appropriate to eliminate repetitive defects and trends.

2.6 Requirements for the Maintenance of Aircraft are contained in BCAR Chapter A6–2 (B6–2), including requirements for Maintenance Schedules, Certificates of Maintenance Review, Certificates of Release to Service, Duplicate Inspections and the Retention of Records. Appendix 1 to Chapters A6–2 and B6–2 describes an acceptable means of compliance with requirements for Condition Monitored Maintenance Programmes.

2.7 It is particularly important that maintenance schedule reviews take account of the age and utilisation of the aircraft and the continuity of corrosion control programmes. More frequent maintenance may be required as aircraft grow older.

3 THE CERTIFICATE OF MAINTENANCE REVIEW (CMR)

3.1 The CMR signatory is required, before issuing the Certificate to ensure that all maintenance is complete, all mandatory inspections and modifications that are due have been complied with, all defects have been rectified or deferred in accordance with company procedures and that all necessary Certificates of Release to Service have been issued.

3.2 Company procedures must permit access in respect of the aircraft being certified, to the approved maintenance schedule and check control system, the mandatory inspection/modification control system, the defect control system, all technical records including worksheets, and to aircraft defects. In the case of computer controlled records access must likewise be provided.

3.3 Quality Control audit records must be available to the CMR signatory on request relative to the aircraft being cleared such that he may discharge his responsibilities under the ANO.

4 DEFECTS AND OCCURRENCES

4.1 An assessment of both the cause and any potentially hazardous effect of defects or combination of defects, and occurrences must be made in order to initiate any necessary further investigation and analysis.

4.2 A system of assessment should be in operation to support the continuing airworthiness of aircraft and to provide a continuous analysis of the effectiveness of the Operator's control systems in use.

4.3 The system should provide for:

(a) *Significant Incidents and Defects.* The monitoring on a continuous basis of incidents and defects that have occurred in flight and of defects found during maintenance and overhaul, highlighting any that appear significant in their own right.

(b) *Repetitive Incidents and Defects.* The monitoring on a continuous basis of defects occurring in flight and found during maintenance and overhaul, highlighting any that are repetitive.

(c) *Deferred and Carried Forward Defects.* The monitoring on a continuous basis of deferred and carried forward defects.

(d) *Unscheduled Removals and System Performance.* The analysis of unscheduled component removals and of the performance of aircraft systems; and its use as part of a maintenance programme.

5 OCCURRENCE REPORTING TO MANUFACTURERS

5.1 The Operator's maintenance organisation should have procedures for ensuring that the organisation responsible for type certification of each aircraft type (usually the constructor) receives adequate reports of occurrences to that type, to enable it to issue appropriate service instructions and recommendations to all Operators.

5.2 Liaison with the manufacturer is necessary to establish whether published or proposed service information will resolve the problem or to obtain a solution to a particular problem.

6 MANDATORY OCCURRENCE REPORTING TO THE CAA

6.1 In addition to reporting occurrences to manufacturers, an Operator's maintenance organisation has responsibilities for Mandatory Occurrence Reporting as required by the Air Navigation Order in respect of public transport aircraft the MTWA of which exceeds 2300 kg. Guidance on meeting the mandatory requirements is given in CAP 382 ('Mandatory Occurrence Reporting – Information and Guidance').

6.2 The maintenance organisation should operate procedures to discharge these responsibilities and personnel should be instructed as to their use. As far as possible these procedures should be integrated with the airworthiness occurrence control system.

6.3 Mandatory Occurrence Reports should normally be made to the CAA through the person authorised under paragraph 8.1 of this Chapter.

6.4 An Operator who has contracted-out maintenance support may also need to submit occurrence reports direct to the CAA and to liaise with the maintenance organisation to ensure that adequate follow-up action takes place, including the provision of supplementary reports.

This is particularly necessary where a foreign maintenance organisation is involved.

7 OTHER OCCURRENCE REPORTING TO CAA

7.1 The organisation should ensure that such other reporting requirements as are prescribed from time to time are met: e.g. reporting Bird and Lightning Strikes in accordance with the relevant Aeronautical Information Circular.

8 RESPONSIBILITY FOR REPORTING OCCURRENCES

8.1 Responsibility for co-ordinating action on airworthiness occurrences and for initiating any necessary further investigation and follow-up activity should be assigned to a suitably qualified senior person with clearly defined authority and status.

8.1.1 Operational and maintenance responsibilities may be combined in one individual as long as the necessary integration is provided by the organisation, i.e. where the Operator undertakes his own maintenance.

8.2 A suitably qualified engineer within the support organisation should be assigned responsibility for co-ordinating with the Operator's operational staff in connection with occurrences which have both airworthiness and operational implications.

8.2.1 This is particularly necessary where the Operator contracts out his maintenance, when it must be clearly shown who performs this task in both the Operations and the Engineering Manuals.

9 DEFERRED AND CARRIED FORWARD DEFECTS

9.1 The systems for controlling deferred and carried forward defects must be described in Operations and Engineering Manuals. When transferring a defect in the Technical Log to the deferred sheets or carrying forward a defect during a maintenance check, the conditions agreed with the CAA for the control of deferred defects must be complied with.

NOTES: (1) Deferred defects are defined as those defects reported in operational service which are deferred for later rectification.

(2) Carried forward defects are defined as those defects arising during maintenance which are carried forward for rectification at a later maintenance input.

9.2 There should be a system to consider the cumulative effect of a number of deferred or carried forward defects occurring on the same aircraft. Any restrictions contained in the Minimum Equipment List must be considered. Whenever possible deferred defects should be made known to the flight crew during pre-flight briefing, prior to their arrival at the aircraft.

9.3 There should be a procedure to ensure that the period for which defects are deferred or carried forward reflects the importance of the defect as it affects airworthiness and/or safe operation. Limitation periods to be applied should be identified in the Exposition or Manual (e.g. flight hours, calendar time, number of sectors, return to base). The control system should ensure that the number of deferred defects and the length of time during which each defect is deferred are kept to a minimum.

9.4 There should be a procedure to ensure that deferred defects are transferred to worksheets at maintenance periods, and to ensure that deferred defects which have not been actioned during maintenance periods, are re-entered on to a new deferred defect record sheet, The original date of the defect must be retained.

9.5 There should be a procedure to ensure that the necessary components or parts are made available or ordered on a priority basis, and that they are fitted at the earliest opportunity.

9.6 There should be a cross reference in the Technical Log to enable each defect which has been deferred to be traced back to its original entry.

10 REPETITIVE DEFECTS

10.1 There should be a system to control and monitor repetitive defects on a continuous basis appropriate to the number of aircraft operated and the nature of the operation. The system should ensure that the history of a particular repetitive defect is not lost at scheduled inspections. A limit to the number of times a particular defect may be repeated should be established, after which it should be brought to the attention of a senior person in the Organisation, usually the Quality Manager. This person is responsible for ensuring that positive action is taken to obviate a further repetition of the defect.

10.2 Defects should be recorded in a standardised way to assist in identifying which problems are repetitive. There should be an arrangement to ensure that line and outstation maintenance personnel have access to repetitive defect information.

11 INSTRUCTIONS TO MAINTENANCE PERSONNEL

11.1 In addition to the technical and procedural contents of documents such as maintenance manuals and the Exposition prepared by the maintenance organisation, there is a need for a system of bulletins or instructions with which to advise maintenance personnel of matters of immediate technical importance, and to define company practices where these differ from other published information.

11.2 The maintenance organisation must therefore have a system for publishing instructions which should be:

(a) Distributed individually to maintenance personnel or in such a way that each person has access to a copy and there is a record kept to show that he has seen each document issued.

(b) Numbered sequentially and dated. Where instructions are revised an issue or revision number must be shown.

(c) Identified as to content, e.g. by ATA Chapter or by aircraft type number so as to permit easy access to particular subjects.

11.3 The principal source of matters to be addressed by the issue of instructions is expected to be the in-service experience of the aircraft being operated and maintained, to which the maintenance organisation finds a need to respond with guidance to maintenance personnel. Other likely sources of information which should not be overlooked include CAA Airworthiness Notices, Occurrence Digests, GASIL, in-service experience reports and similar continuing airworthiness information published by airworthiness authorities and manufacturers.

11.4 Where instructions are issued which conflict with, or vary, information published by manufacturers or other sources it must be clearly shown which information takes priority. It must also be ensured that instructions cannot be construed as overriding published mandatory information or concern matters beyond the scope of the Approval held by the organisation.

12 TECHNICAL RECORDS

12.1 A department responsible for the compilation and co-ordination of technical records should maintain a data recording system:

(a) Such that it is possible to ensure that the hours of service or elapsed times quoted in the approved Maintenance Schedule are not exceeded as regards components and structural assemblies, and that scheduled maintenance periods are adhered to.

(b) To record the number of landings, flights or cycles, and the use of maximum contingency or intermediate contingency power, when this information is specified in the approved Maintenance Schedule or manufacturer's manuals as a basis for inspection or other necessary action.

(c) To process the foregoing information into aircraft, engine and propeller log books or equivalent records, to maintain the records and documents concerning overhaul and repair work, component changes, mandatory modifications and inspections and to maintain the Modification Record Book (CAP 259).

12.2 A computer may be used as part of a technical records system with the agreement of the CAA. In this case procedures should be instituted which will ensure that the computerised record will provide storage, preservation and retrieval to the same level as would have been achieved by hard copy records. CAA acceptance of computerised recording does not exempt the Operator or his contracted maintenance organisation from complying with the appropriate provisions of the Air Navigation Order for the keeping and retention of records.

NOTE: Guidance material to identify the CAA attitude to the acceptance of computer control systems is contained in Airworthiness Information Leaflet AD/1L/0134/1–4.

13 DOCUMENTATION FOR MAINTENANCE CHECKS

13.1 The department responsible for technical records should also be responsible for the accuracy of the documents issued for a maintenance check and should maintain a procedure to ensure that only documents to the latest amendment state are issued, and that all superseded documents are withdrawn and cancelled. Working documents made available for use by hangar engineering staff such as worksheets or cards should include:

(a) A list of inspections, checks or work items required to meet the requirements of the approved maintenance schedule and adequate directions for their implementation.

(b) The part numbers and serial numbers (unless not relevant to component control) of all components to be removed and replaced, and their locations on the aircraft.

(c) Details of any modifications which have to be incorporated during the check.

(d) Any mandatory or special inspections, or any other checks which are required to be made by the company in addition to those required by the approved maintenance schedule.

(e) Detailed procedures for engine runs, power unit or propeller change, fuel flow tests, duplicate inspection of controls, landing gear retraction tests etc., as applicable.

(f) A list of outstanding deferred and carried forward defects.

13.2 Additional worksheets or cards should be provided for recording the work completed as a result of the maintenance check and any defects arising from inspections.

13.3 All worksheets or cards should be readily identifiable and should bear an issue number. They should also be identified to associate them positively with the relevant items in the maintenance schedule. The procedures for documentation control should ensure that if any worksheet or card is mislaid or lost this will be readily apparent on completion of the check, and that each 'pack' of worksheets or cards is complete and certified before the aircraft is released for service.

13.4 Before issue, all worksheets or cards must be recorded on a 'workpack control' sheet which should also state the following:

(a) Name and JAA/CAA Approval reference of the maintenance organisation.

(b) Aircraft type and registration letters.

(c) The maintenance check to be carried out.

(d) The date.

(e) The approved maintenance schedule reference number and amendment state.

(f) The name of the Operator whose aircraft is being maintained.

13.5 Technical records are deemed to be essential records and may not be destroyed without permission from the CAA.

13.6 The compilation of maintenance check documentation may, alternatively, be allocated to a maintenance planning department, subject to the agreement of the CAA. In such cases the company Exposition must contain details not only of the procedures of the planning department through which the documentation is compiled but also of the monitoring programme exercised by Quality Assurance.

14 AIRWORTHINESS DIRECTIVES AND MANUFACTURERS TECHNICAL INFORMATION

14.1 Maintenance organisations must have procedures and the necessary personnel to ensure that Airworthiness Directives are complied with as required. It must be quite clear, when maintenance accomplishment is in any way subcontracted, where responsibility lies for compliance with Directives.

14.2 When assessing the overall capability of the organisation to provide satisfactory maintenance support, the CAA will take into account the organisation's arrangements for:

(a) The assessment of incoming technical information from manufacturers, including Service Bulletins, relating to relevant aircraft types.

(b) Initiating action as necessary on such information, particularly in relation to the Maintenance Schedule.

(c) Responding to requests by the Manufacturer and the CAA, to have 'in-service' experience reports transmitted for their evaluation.

NOTE: The CAA may require access to an Operator's assessments of manufacturer's service information to assist in evaluation of such information for the purpose of possible mandatory classification.

14.3 When manufacturer's service information is received an immediate assessment must be made to establish priority of response. Matters of significant airworthiness importance, such as those having an impact on ETOPS flights, must be responded to promptly.

NOTE: CAA requirements for Extended Range Twin Operations (ETOPS) are contained in CAP 513.

14.4 By means of Modification Records (AD 259), Technical Records, Log Books or other means adopted by the organisation it must be possible at any time to establish the record of compliance with Directives and Service Information for each of the Operator's aircraft.

14.5 Operators must ensure that the relevant aircraft manufacturer is aware that they are users of his aircraft so that all relevant service information, details of in-service experience of the aircraft and amendments to manuals, including the Flight Manual, are received and embodied in a timely manner. This is especially important where the Operator is not the original owner of the aircraft, or it has been leased from the owner.

14.6 Where manuals, including the Flight Manual, have been prepared or amended by an agency other than the manufacturer, the Operator must ensure that amendments are prepared as necessary, submitted to the CAA through an appropriately approved organisation for approval and incorporated into manuals promptly.

14.7 The technical library must hold and make available to personnel concerned the necessary technical data, e.g. JAA/CAA publications, the ANO, manufacturer's manuals, any relevant service information, any other related literature appropriate to the aircraft types covered by the AOC and copies of appropriate company manuals, procedures and Instructions. A person must be appointed to be responsible for the technical library.

14.8 Arrangements must be made for:

(a) The supply of amendments, so that all publications are kept up-to-date, and for departments concerned to be notified of such amendments, and of any additional technical information relevant to the work undertaken.

(b) Maintenance manual information recorded on microfilm, microfiche or disk to be checked at specific intervals for amendment state and legibility, and any temporary amendments to be kept available adjacent to each reader.

14.9 Arrangements should be made for all technical drawings to be suitably stored and a procedure operated to ensure that only drawings of the correct issue are released. A person should be made responsible for maintaining an up-to-date record of drawings available and also for notifying departments concerned when drawings have been superseded by a later issue.

14.10 The technical library must make arrangements for manuals or sections of manuals, schedules, service information, etc., appropriate to the work undertaken, to be made available to line maintenance stations and a suitable procedure maintained to ensure that such information is kept up to date.

14.11 Microfilm, microfiche and compact disk viewing and printing equipment must be available, as appropriate, at each location where manuals in these formats are in use, and in the library. Adequate arrangements must be made for regular maintenance of the equipment and users should be made aware of contact points for servicing and repair.

15 SPARES

15.1 **Provision and Storage.** The Operator must provide for sufficient spares to be available to ensure that aircraft, engine and equipment defects can be promptly rectified. Spares may be provided by either the Operator or the maintenance organisation, as contractually agreed, but must as far as possible be located where they will be required to be used.

15.2 Account must be taken of the Operator's Minimum Equipment Lists (MEL) to ensure that essential spares to support the rectification of defects in systems required for operation are placed where they are most likely to be needed and in such numbers as to ensure that successive defects will be promptly addressed.

15.3 Operators may make arrangements with manufacturers and overhaul agencies for the provision of spares on demand subject to the arrangements being the subject of a firm contract. Spares obtained from another Operator or Maintenance Organisation will only qualify for installation if the source is considered to be acceptable within the criteria defined in CAA Airworthiness Notice 17.

15.4 The CAA may require to examine spares provisioning arrangements and any agreements entered into to ensure that adequate support for defect rectification is being made. Where necessary the CAA may require additional provisions to be made.

15.5 Spares provisions at each maintenance location should be determined when the particular base or station is commissioned and published in the company instructions/procedures defining the maintenance operations undertaken at the particular location.

15.6 Spares holdings should be reviewed at regular intervals at all locations to ensure that:

(a) Redundant items are removed, e.g. for aircraft no longer operated.

(b) Superseded parts, or those with out of date modification states, are removed for replacement or up-dating.

(c) Previously assessed numbers of spares remain adequate for support in relation to routes, frequency of flights and numbers of aircraft.

(d) Airworthiness Directives and other mandatory requirements published while parts are in storage are complied with before the part is released for service.

15.7 **Storage Procedures.** All spares must be stored, at all times and locations, in such a manner as to ensure that they remain airworthy and fit for use when required. Parts must be used in rotation so that they remain in stores for as short a time as possible, i.e. first in – first out.

15.7.1 Procedures must be established to control the return to stores of items withdrawn for use but not needed, especially where the item has been installed in the aircraft and subsequently removed. The robbery of components from completed assemblies must be rigidly controlled and any removal positively identified.

15.7.2 Spares having a limited allowable shelf life, including materials and consumable products, must be identified and controlled.

15.7.3 Stores references or batch numbers should be recorded on worksheets, cards or technical log pages so as to facilitate subsequent tracing of the associated part to source.

15.7.4 Management procedures and conditions of storage must be reviewed regularly to ensure that satisfactory standards are being implemented.

16 INSTRUCTIONS TO FLIGHT CREWS

16.1 Operators should arrange for written instructions to be included in the Operations Manual so that:

(a) Aircraft commanders are advised of the action to be taken to obtain engineering assistance when aircraft are away from main base, of the procedures which are acceptable for any necessary certifications, and of the procedure to be adopted where any doubt exists over work being carried out by any other organisation, or which cannot be certified.

(b) Where no arrangements have been made in respect of engineering support at route stations, aircraft commanders are advised of the procedures to be followed for reporting defects to main base. See also Chapter 8 paragraph 9.

(c) Where it is desired to transmit advisory information of a temporary nature to flight crews, e.g. in respect of modifications to the aircraft, trial installations or other changes which the crew need to be aware of during their operation of the aircraft, or which impose operating restrictions, an information sheet should be included in the Technical Log containing the relevant data.

17 AIRCRAFT REFUELLING – QUALITY ASSURANCE

17.1 The Operator must be satisfied with the quality of all fuel taken on board his aircraft, particularly in respect of freedom from water contamination.

17.1.1 Fuel suppliers within the United Kingdom are required to comply with the provisions of the Air Navigation Order Article concerned with Aviation Fuel at Aerodromes and must ensure that fuel dispensed is fit for use in aircraft. The Operator must comply with this Article himself if he has a facility or vehicle in which fuel is stored and/or delivered to aircraft.

17.2 The Operator is required to:

(a) Keep a record of the fuelling arrangements at each station where fuel is uplifted, indicating the company or person responsible for monitoring the fuel supplier. This may be a nominated airline at each location, or the Operator may, himself, choose to monitor the supplier's quality performance.

(b) Institute a fuel uplift sampling programme taking into account matters such as:

(i) Known supplier quality performance, including any history of contamination.

(ii) Local environmental conditions, e.g. likely sources of contamination including microbiological contamination.

(iii) Supply facilities.

(iv) Frequency of use.

(c) Provide flight crew with guidance on the accomplishment of fuel uplift sample checks and clear instructions as to when these are to be carried out.

(d) Provide maintenance personnel with guidance, in respect of fuel quality sampling, in relation to their station. Ensure that persons engaged in refuelling activities are properly trained for their tasks.

(e) Audit the arrangements as defined to ensure the continuing acceptability of fuel quality throughout the operation.

17.3 The minimum frequency of fuel contamination checking, at the point of uplift, must be declared in guidance to maintenance personnel and acceptable to the CAA.

17.4 The control of fuel storage and dispensing by suppliers should conform to the standards defined in CAP 434, Aviation Fuel at Aerodromes.

18 ALL WEATHER OPERATIONS – MAINTENANCE REQUIREMENTS

18.1 **CAP 359** – All Weather Operations, defines the means by which an Operator can achieve approval to perform operations in Category 2 or 3 landing conditions. In order to perform such operations certain aircraft systems must be fully serviceable and the equipment in those systems must be to a defined modification standard.

18.2 The Operator or his maintenance organisation must publish guidance to maintenance personnel and flight crews on the control of the validity of all weather categorisation. This guidance should take the form of:

(a) A list of the systems required to be fully serviceable in order to qualify the aircraft for Category 2 or 3 operations.

(b) A company procedure for the control of the modification status of the equipment fitted in the required systems which are deemed to be 'sensitive' in terms of all weather operations.

(c) Placards applied to both equipment and installation to alert maintenance personnel to the need to fit only controlled equipment.

(d) Procedures for downgrading all weather capability from Category 3 or 2 to Category 1 in the event that an uncontrolled item of equipment is fitted or after any defect in an affected system or any event which results in disturbance of the system.

(e) Procedures for up-grading capability from Category 1 to Category 2 or 3 as appropriate when serviceability is proven, normally by performing a successful Category 2 approach or Category 3 landing in Category 1 weather conditions (sometimes referred to as a standard landing).

18.3 Provision should be made to inform the crew of the Category 2 or 3 status of the aircraft before the flight is begun.

18.4 When setting alert levels in system reliability monitoring, consideration must be given to the levels of reliability assumed in qualifying the aircraft for Category 2 or 3 operations. Significant trends must be responded to promptly or all weather classification must be suspended until remedial action has been taken.

Note: The published company procedure for controlling the engineering aspects of all weather operations, incorporating the subjects included in this paragraph, forms part of the details required by the CAA for grant of operational approval. It should,therefore, be sent to the AOC Maintenance Office, for assessment.

19 PREPARATION OF AIRCRAFT FOR FLIGHT

19.1 The ANO Article concerned with preflight action required to be taken by the aircraft commander prescribes that he satisfy himself that the aircraft is fit in every way to make the intended flight. In order to permit the Commander to discharge this responsibility, in respect of the maintenance of the aircraft, the Operator must:

(a) Ensure that the Operations Manual and Maintenance Schedule contain a pre-flight inspection to be completed by the crew, or by maintenance personnel where available, with which to verify that the aircraft continues to be serviceable. Details of this inspection should also be included in the Technical Log.

(b) Provide information, preferably, in the Technical Log, to advise the Commander when the next Scheduled Maintenance Inspection (SMI) is due, by flying hours and calendar time, any defects existing on the aircraft affecting its operational airworthiness and safety, and any maintenance actions falling due before the next SMI.

(c) Where a procedure acceptable to the CAA exists for the control of maintenance actions necessary between Scheduled Maintenance Inspections it may not be practicable to include full details in the Technical Log. In such cases it should be possible for flight crew to verify, with the assistance of maintenance personnel if necessary, that no maintenance task is due or will become due before the end of the intended flight.

(d) Provide any other information to the crew concerning the aircraft and its systems, including changes resulting from modifications, which may affect the operation of the aircraft.

(e) Have management and quality assurance procedures which will ensure that, whether the aircraft is dispatched by the Operator or the task is wholly or partly sub-contracted:

(i) Fuel uplifted prior to flight is free from contamination.

(ii) Refuelling of the aircraft is carried out in a controlled manner taking into account essential safety measures for fire prevention. CAP 74 – Aircraft Fuelling, provides guidance to all persons concerned with the fuelling of aircraft, including helicopters.

(iii) Baggage and cargo is loaded and restrained in accordance with Flight Manual limitations and that cargo doors are securely fastened.

(iv) Push-back and start-up are carried out to a standard procedure for the specific type of aircraft, under the control of a suitably trained person, that the area in which engines will be started is free from debris and contamination likely to damage the engines and that fire-fighting facilities are immediately available.

NOTE: It is recommended that ground personnel take appropriate precautions when push-back occurs during electrical storms and lightning. Interphone connection should not be made with the aircraft and dispatch instructions should be given with agreed hand signals.

(v) Control surface and landing gear locks, restraint devices and blanks are removed.

(vi) Proper attention is given to the rectification of recorded defects, compliance with the MEL and any limitations imposed in respect of the period of flights, flying hours or calendar time, and

(vii) The aircraft is serviced and inspected as required by the approved maintenance schedule.

19.2 Where aircraft are not dispatched by or under the direct control of appropriately authorised maintenance personnel it must be ensured that persons performing dispatch tasks have been properly trained to do so and have been given written authority to that effect, and where tasks are divided between two parties the responsibilities of each are clearly defined.

19.2.1 Written authority may be granted individually or to a group of persons by virtue of a maintenance agreement, where the contracted party has its own system of authorisation.

19.2.2 Where flight crew personnel are authorised it is sufficient for the particular training and authority to be included in training records.

20 CABIN RECONFIGURATION – APPROVAL AND CONTROL

20.1 Any change to the cabin configuration from that for which the aircraft was first certificated constitutes a modification which must be approved by the CAA. Airworthiness requirements to be satisfied in order to gain CAA approval of cabin re-configuration for the carriage of cargo are shown in Appendix A to this Chapter.

20.2 Revised or alternative seating layouts, the fitting of stretchers or the conversion of the cabin to a cargo carrying role all constitute modifications which must conform to an approved design and be certified with the issue of a Certificate of Release to Service (CRS) each time they are installed or the original configuration is restored. (See also paragraph 20.8).

20.3 The Operations Manual and instructions to maintenance personnel must contain precise descriptions, preferably pictorial, of the approved configuration and any limitations to be observed. It is recommended that the various actions necessary are summarised in a checklist in each case, particularly in respect of the fitting or securing of emergency equipment and exits. Checklists should be readily available to personnel when carrying out configuration changes.

20.4 Where any possibility of error exists, such as in the position of seats and of fitting incorrect seats at and adjacent to emergency exits, the aircraft and the item to be fitted should be clearly marked and the pictorial diagram of the configuration should illustrate the arrangement.

20.5 Clear and easily interpreted guidance must be given to persons responsible for loading and securing the aircraft for flight so that the conditions of the approved modification are observed. In cases where the main cabin is used for the carriage of cargo it should be possible to readily install a configuration embodying methods of restraint which will ensure compliance with cabin design limitations without the need for extensive calculations at the point of dispatch.

20.5.1 It must be ensured that all cabin configurations are fully represented in APS weights and indices used in the loading calculations made prior to flight dispatch.

20.6 Approved modifications for cargo configurations should contain the various restraint practices used by the Operator to facilitate the satisfactory carriage of different types and sizes of load.

20.7 Operators must have a care and maintenance programme for cargo containers and pallets used either in cargo holds or the main cabin, particularly where the container itself is designed to provide necessary restraint and, in some cases, fire containment. CAA requirements for the use, care and maintenance of Unit Load Services (ULD) are contained in Appendix B to this Chapter.

20.8 **Certification of Changes**

20.8.1 Certificates of Release to Service (CRS) must be issued for each change of configuration. The CRS must refer to the modification being embodied or removed but may do so through reference to a company instruction or role diagram etc which directly records compliance with the requirements of the modification.

20.8.2 Certificates of Release to Service may be issued by appropriately licensed or authorised personnel. Alternatively Operators may apply to the CAA through their assigned Flight Operations Inspector for exemption from the need to issue CRS. Details of the Exemption, with limitations and conditions, are contained in Appendix C of this Chapter.

21 BALLOONS

21.1 The Operator must establish procedures to ensure:

(a) that all appropriate Maintenance Schedules, Maintenance Manuals, Service Bulletins, CAA or foreign mandatory inspections/modifications publications and any other supporting information necessary for the maintenance of a particular balloon are available to personnel working on the balloon,

(b) that all such publications are kept up-to-date and that the Approved Maintenance Schedule is regularly reviewed to reflect the maintenance needs of the balloons,

(c) that all manufacturers' service information is evaluated and appropriate action taken as considered necessary,

(d) that all required scheduled maintenance, mandatory inspections modifications and defect rectification are carried out,

(e) that all materials and parts used or held in storage have been obtained from acceptable sources and are fit for use,

(f) that storage conditions are satisfactory and batch control guarantees traceability to source,

(g) that calibration/servicing, where appropriate, of tools, test equipment or servicing rigs is carried out at the appropriate intervals and suitable records are maintained,

(h) all technical documentation such as log books, work sheets etc., are maintained in a complete and up-to-date manner,

(i) that any outstanding defects considered acceptable for flight on completion of the particular scheduled maintenance are notified to the Commander and endorsed in the Technical Log,

(j) that the organisation responsible for type certification of each balloon type (usually the manufacturer), and the maintenance organisation, receive adequate reports of all airworthiness occurrences to that type, to enable the issue of appropriate service instructions and recommendations to all operators.

NOTE: Mandatory Occurrence Reporting is required by the Air Navigation Order in respect of public transport aircraft exceeding 2300 kg MTWA. It is recommended that balloon operators not affected by this requirement nevertheless report to the CAA any occurrence interpreted as within the guidance given in CAP 382 – Mandatory Occurrence Reporting – Guidance and Information.

21.2 The Operator must establish a procedure acceptable to the CAA to ensure that Commanders discharge the following responsibilities:

(a) that all routine servicing/maintenance is carried out including pre-flight checks,

(b) that defects affecting airworthiness or safe operation of the balloon are recorded in the Sector Record Page of the Technical Log,

(c) ensure that defects are rectified before flight by appropriately qualified persons, or are deferred in a manner acceptable to the CAA and in accordance with the provisions of an allowable defects list.

22 AIRCRAFT EXTERNAL DAMAGE MARKING

22.1 In the course of normal service aircraft may suffer external damage in the form of scratches and minor dents as a result of collision with cargo and baggage loading equipment, access steps and vehicles.

22.2 Operators should have a system for identifying such damage after inspection and acceptance by the supporting maintenance organisation so that it is readily apparent when new damage occurs.

22.3 Damage should be entered in a record kept in the aircraft either directly on pictorial diagrams or by use of a grid referencing system. Such records may be included in the Technical Log or another readily available document.

22.4 When considered desirable as a means of prompt recognition of accepted damage it is acceptable for the actual damage to be marked using a suitable method of identification.

22.5 The damage record for each aircraft must be reviewed from time to time to ensure that it has been kept up to date, that repaired damage is removed from the record and that the cumulative effects of damage do not exceed manufacturers limitations.

23 AIRCRAFT FURNISHINGS

23.1 Operators and maintenance organisations must have adequate control over the cleaning of aircraft furnishing materials. For this, they need to have a knowledge of the material type, the recommended cleaning or proprietary finishing processing methods, the effects of time in service on the flame resistance properties, the flame retardant processes applied, if any, and the method of re-application of such a process, where this is necessary.

23.2 Where materials, e.g. seat covers, require the application of a proprietory flame retardant process in order to satisfy airworthiness requirements it is strongly recommended that each item is identified with the number and type of cleaning actions it receives until it is re-proofed.

23.3 It is not acceptable to place reliance on unsubstantiated claims concerning the continuance of flame resistant properties of a material after durability or additional flame retarded processes have been applied. Where such processes have been applied, there is a need to prove the continued acceptability of a particular material or process in service, and, therefore, further flame resistance tests must be conducted in accordance with requirements identified in CAA Airworthiness Notices 58 and 59 as appropriate.

24 THE MAINTENANCE OF CABIN AND OTHER SAFETY PROVISIONS

24.1 Provisions made for the safety of passengers in flight and in the event of emergency alighting may be subject to abuse by passengers either deliberately or by virtue of frequent use. It is therefore essential that regular inspections take place to ensure that the means by which the particular provision is implemented remain valid and any defined or implied inspection requirements are accomplished.

24.1.1 In some cases re-configuration of the cabin can result in seat positions, placards and emergency equipment being moved or omitted.

24.2 Subjects which require frequent monitoring include the following matters where the requirement has been notified as a CAA Airworthiness Notice, with, or without, a specific maintenance requirement:

(a) Stowage and accessibility of lifejackets.

(b) Continuing compliance, and test, of floor proximity escape path marking.

(c) Testing of cabin and toilet smoke detector systems.

(d) Access to and functioning of type III and IV exits.

(e) Integrity of cargo compartment fire containment capability, linings and seals.

(f) Inspection of catering carts and trolleys, brakes, restraints and placards.

(g) Functional test of inflatable escape chutes and flotation devices (aeroplanes and helicopters).

(h) Continuing integrity of toilet fire precautions.

(i) Protection of liferafts and flotation bags from damage after deployment.

(j) Compliance with approved cabin configurations for seat positions, access to exits and minimum space for seated passengers, particularly where seats are regularly removed and refitted.

(k) Statutory provisions for the marking of exits and break-in areas.

CHAPTER 4 APPENDIX A – THE CONVERSION OF PASSENGER CABINS FOR THE CARRIAGE OF CARGO (AEROPLANES) – AIRWORTHINESS REQUIREMENTS

1 GENERAL

1.1 The Flight Manual may often include structural limitations in terms of floor loading and the strength of fixtures but no information is usually given in respect of crashworthiness, emergency escape or fire precautions. In any event the Flight Manual rarely defines the configuration used by the Operator and any details included in the Flight Manual, for example in respect of restraint methods, are in a Section which is not usually subject to CAA assessment and approval.

1.2 Where the Operator wishes to use such aircraft for the purpose of carrying cargo, approval of the associated cabin configuration must be obtained by modification action to show compliance with the following requirements.

2 ALL AEROPLANES WITH A MAXIMUM CERTIFICATED TAKE-OFF WEIGHT ABOVE 5700 KG (12,500 LB)

2.1 **Fire Precautions,** BCAR Chapter D4–3 paragraph 6.2 (JAR 25.855) and either:

(a) BCAR Chapter D4–3 paragraph 6.3.2 or JAR 25.857(b) as a Class B cargo compartment, or

(b) BCAR Chapter D4–3 paragraph 6.3.5 or JAR 25.857(e) as a Class E cargo compartment and

2.2 **Crashworthiness,** BCAR Chapter D3–8 paragraphs 2.2 and 2.3 including D4–3 paragraphs 2.2 and 2.3, or JAR 25.561(c) and 25.787 and

2.3 **Emergency Exits,** BCAR Chapter D4–3, paragraphs 4.2.1, 4.2.5(j) and 4.2.6 or JAR 25.787, 25.803(a), 25.805 and 25.809.

3 ALL AEROPLANES WITH A MAXIMUM CERTIFICATED TAKE-OFF WEIGHT OF 5700 KG (12,500 LB) AND BELOW

3.1 **Fire Precautions.** There are no compartment classifications in BCAR Section K or BCAR 23.

(a) If the crew can easily detect the presence of smoke (e.g. where there is no physical barrier between crew and load) then no smoke detectors or additional fire extinguishers are required (although Operators may consider them to be desirable in which case they may be incorporated into modifications). The Operations Manual must say 'land at the nearest available airfield' in such circumstances.

(b) If the crew are separated from the cargo then a detector is required. Detectors would also be required in a pressurised aircraft unless it can be shown that the airflow path from a fire to the cabin air outflow will bring a fire to the notice of the crew reasonably quickly.

3.2 **Crashworthiness.** The load must be restrained to the requirements of BCAR K3–8 paragraphs 2 and 3 and K4–3 paragraph 2, or BCAR 23.561(e) and 23.787. The means of restraint may be a bulkhead, barrier net, tie downs or nets or any combination shown to meet the requirements.

3.3 **Emergency Exits.** The load must not prevent or impinge upon the crew emergency exit route or the exit. BCAR Chapter K4–3 paragraphs 2, 4.3 and 4.4 apply, or BCAR 23.787 and 23.807.

4 FLIGHT MANUAL

Where emergency procedures are simple in content, i.e. 'land at nearest airfield in the event of a cabin fire', it is acceptable for them to be included in the Operations Manual only (see paragraph 5 below). In any other cases, for example where more detailed operational limitations/conditions or crew action is necessary a Flight Manual Supplement or Change Sheet will be required and should be submitted for approval with the modification proposal.

5 OPERATIONS MANUAL

5.1 An Operations Manual amendment must be submitted as part of the modification. It must be possible, by reference to the Operations Manual or related instructions such as a loading manual, to respond to the airworthiness considerations taken into account in the Modification. If the crew are themselves responsible for achieving the passenger to cargo re-configuration the Operations Manual guidance must be such as to enable them to readily satisfy the limitations and approved arrangements of the modification.

5.2 Typical contents of the Operations Manual will include:

(a) The identity of the Modification and CAA Approval.

(b) The means of identifying fire and the necessary response derived from 3 above.

(c) Any other guidance in respect of fire in the cabin. (The modification may include guidance from other parts of the Flight Manual, FCOM, POH etc.)

(d) Cargo loading limitations, e.g. maximum height, width and forward dimensions.

(Other limitations in the Manual, e.g. floor loading and attachment point strengths may be repeated.)

(e) Methods/Routes of escape in the event of an emergency landing/stop.

The locations of smoke/oxygen masks and other fire-fighting equipment may also be shown, including fire extinguishers if appropriate, (i.e. if the crew is/are able to use them.

6 REQUIREMENT FOR A MODIFICATION

6.1 A modification is required to show how the aircraft cabin is converted from passenger to cargo use and how the relevant airworthiness requirements are satisfied.

6.2 The modification should be presented to the CAA in draft form for classification. It should describe the cabin in its modified condition for carrying of cargo and typically will include extracts from the manufacturer's loading instructions. Cargo 'bays' should be shown, if applicable, together with the relevant floor loading limitations, (with or without floor spreader boards as appropriate).

6.3 The involvement of an approved design organisation will be necessary where design changes take place, special equipment is fitted or it is necessary to make performance assessments, (unless the changes are the subject of a manufacturer's approved modification or Service Bulletin). Typical instances include the installation of fixed freight restraining bulkheads/barriers, the location of smoke detectors and the determination of cabin airflow patterns.

CHAPTER 4 APPENDIX B – THE USE, CARE AND MAINTENANCE OF CARGO UNIT LOAD DEVICES (ULD)

1 USE OF CARGO CONTAINERS, PALLETS AND NETS (UNIT LOAD DEVICES)

1.1 In addition to providing an efficient means of transfer and loading, containers and pallets are designed to ensure that cargo and baggage is properly restrained.

1.2 To ensure that the restraint capabilities of both containers, pallets and nets are fully effective and that airworthiness requirements are satisfied, it is essential that no unit is used which is damaged beyond the ULD manufacturer's specified limits. In the case of containers, doors and screens must be fully attached using all fasteners and latches.

1.3 Specific attention must be paid to the manner in which cargo is loaded on to pallets and the method of restraint utilised. The net (or strap) and pallet combination must restrain the loaded cargo as required by the Flight Manual, usually to withstand inertia forces of $1^{1}/_{2}$ g forwards in the case of a Class II system or 9 g in the case of a Class I system. Instances are frequently found where nets are used solely to hold the load together without due attention being paid to the need to attach the load to the pallet so as to comply with aircraft design requirements.

1.4 Operators are reminded of their responsibilities for safe operation including security of cargo. Contracts with cargo agencies must state clearly how cargo is to be restrained and the contractor's performance must be regularly monitored, including checks at the point of loading on to the aircraft.

2 CARE AND MAINTENANCE OF UNIT LOAD DEVICES

2.1 CAA requirements in respect of the care and maintenance of cargo containers, nets and pallets (ULD) are contained in Airworthiness Notice 92. It is recommended that the Operator's care and maintenance programme is included in the Loading Manual or a similar document to which persons responsible for using containers have access.

2.2 Acceptable damage limits must be given, as stated in the manufacturer's manual, together with the company procedure for responding to unacceptable damage. The procedure should show how units are to be directed to a CAA approved organisation for repair and show the position in the company of the persons responsible for declaring units fit for service at each station served. Operators may arrange for containers damaged overseas to be repaired locally provided that the repair facility is appropriately approved by the Responsible Authority and details of the repair are recorded and certified in accordance with the requirements of that Authority.

2.3 It is essential that cargo/baggage handling personnel are kept fully aware of the airworthiness implications of damage and mis-use of cargo restraint equipment. Empty containers for example, should be stored on rails at the correct height to permit transfer to trolleys. Containers must never be lifted with fork-lifts, especially when full, unless they are specifically designed for the purpose.

2.4 ULDs should be inspected before use and discarded, if damaged, for detailed examination and repair at a later date. Inspections of all ULDs should be made at each station at frequent intervals to ensure that overall standards remain high and the condition of ULD is satisfactory.

2.5 Specific guidance should be given to both loading and maintenance personnel so that the division of duties in respect of ULD serviceability is fully understood.

CHAPTER 4 APPENDIX C – CERTIFICATION OF CABIN CONFIGURATION CHANGES – EXEMPTION FROM ANO ARTICLE 11 (ISSUE OF CERTIFICATE OF RELEASE TO SERVICE)

1 Operators who wish to be exempted from the need to issue a Certificate of Release to Service for a configuration change, should apply via their assigned Flight Operations Inspector. An exemption may be granted subject to the undermentioned conditions and within the following limitations.

2 LIMITATIONS

(a) Exemptions will be limited to changes of aircraft seating arrangements, and the installation of a cargo configuration, with the subsequent restoration of the passenger configuration, in aircraft not exceeding 5700 kg MTWA.

(b) Exemptions may be granted for the certification of installing a stretcher in aircraft of any weight.

3 CONDITIONS

(a) The configuration to be installed must be approved by the CAA.

(b) The configuration must be clearly defined in the Operations Manual in terms of the installation, layout, equipment to be removed/fitted, placards to be visible and any tests required.

(c) In association with the supporting maintenance organisation all persons carrying out these changes must be appropriately trained to perform the required tasks and record kept of the training.

(d) The Operations Manual must contain details of the company procedure for controlling configuration changes including appropriate terms of reference for the person nominated to manage this task.

(e) Each change of configuration must be recorded in the Technical Log and signed in the Action Taken column by the person approved and responsible for carrying out the change.

CHAPTER 5 – MAINTENANCE FACILITIES

1 GENERAL

Facilities provided by the supporting maintenance organisation, at each location where maintenance is performed, must be adequate for the size and scope of the operation and be such as to enable personnel to perform their duties satisfactorily.

2 WORKING ACCOMMODATION

2.1 Covered accommodation must be provided to house aircraft completely during Scheduled Maintenance Inspections except as may be agreed by the CAA in a particular case. The accommodation should have provision for heating and have a good standard of overall and concentrated lighting. The floors should be sealed to minimise dust and to assist in maintaining a satisfactory house-keeping standard.

2.2 Minor scheduled or pre-planned maintenance of aircraft in the open is acceptable provided it is closely controlled by the Operator/ maintenance organisation concerned. It must be ensured that:

(a) work packages are continually assessed in order to determine that their contents do not include complex maintenance tasks which, with more effective planning, could be conducted at a maintenance base where covered accommodation is available;

(b) due consideration is given to the weather conditions prevailing at the time the maintenance is being completed, including the extent of the external work required and the amount of protection given to the personnel involved;

(c) there is sufficient ground servicing and support equipment for the tasks undertaken including provision of effective lighting, heating, portable covers and access equipment.

2.3 Those areas of an aircraft that may require unscheduled work in the open, e.g. for rectification of defects, major replacements, or any work where the ingress of moisture, dust etc., could be detrimental, must be provided with protective cover against adverse weather conditions, and adequate lighting to facilitate the work.

3 MAINTENANCE EQUIPMENT

3.1 Sufficient rostrums, stands or docks must be provided to permit access to all parts of the aircraft, together with suitable racks and stands for engines, aerofoil surfaces and other components removed from aircraft. Accommodation must also be provided for drawings, maintenance manuals, maintenance schedules, worksheets etc. Particular emphasis is placed on the need for complete docking installations for larger aircraft where positioning of rostrums, stands, ladders and lifts is time consuming and their use does not provide comprehensive access to upper surfaces of wings, fuselage and tail.

3.2 Equipment necessary for the completion of work required by the approved Maintenance Schedule must be available, together with any special test equipment needed for the diagnosis of faults and related functional checks specified in the relevant technical publications.

4 TEST FACILITIES AND TOOLS

4.1 The organisation must have, or must have access to, suitable facilities for carrying out such tests as are necessary to establish compliance with the appropriate standards and specifications.

4.2 Maintenance equipment, tools and test equipment should be controlled to ensure that they remain fit for use when required and, where necessary, serviced or calibrated at such intervals as necessary to maintain confidence in their accuracy. Equipment and tools should be marked with the date when the next check is due.

5 OFFICE ACCOMMODATION

5.1 Suitably furnished offices for quality control and inspection staff and supervisors should be provided and should be such that manuals and drawings may be studied and aircraft maintenance documents may be controlled, completed and checked without undue disturbance.

6 STORAGE FACILITIES

6.1 A controlled stores area must be provided at each location where spare parts and materials are held, and a person should be appointed to be responsible for its day-to-day operation. A secure area must also be provided where it is necessary to segregate parts and materials which are unfit, or improperly certified for aircraft use.

6.2 Suitable controlled arrangements must be made for the storage of bulky items such as wheels, brakes, engines, propellers and major aircraft assemblies which cannot be housed in the main store.

6.3 Provision must be made for the storage of:

Tools and Equipment,

'Pre-load' items awaiting immediate fitting to the aircraft to rectify deferred or carried forward defects,

Flammable Materials.

6.4 The environmental conditions in all storage facilities must be such as to ensure that parts and materials are maintained in a fit condition for use throughout their period of storage.

7 WORKSHOPS

7.1 Workshop facilities are not normally the subject of an investigation for AOC purposes. Overhaul and repair services provided by the maintenance organisation must be the subject of direct approval by the CAA in accordance with the provisions of BCAR, Chapter A8–3 or JAR–145.

7.2 It is permissible, however, for tasks directly associated with the maintenance of the aircraft to be carried out in workshops specially designed to facilitate the task. Such tasks include power plant and wheel build-up, battery testing and charging, sheet metal work and the servicing of seats, galleys and furnishings.

NOTE: Procedures must be in place to ensure that components removed from aircraft for repair and return to service on the same aircraft are properly controlled and that all work is certified by issuing a CRS.

7.3 All such workshop activities must be the subject of investigation and agreement by the appropriate CAA, SRG, Aircraft Maintenance Standards Department area office. Acceptable conditions for CAA agreement include:

(a) All workshops should be equipped with effective heating and lighting and should be kept clean and free of extraneous materials.

(b) Where hydraulic component rectification and testing is undertaken, positive segregation of the work and test areas for components in which incompatible fluids are used, should be provided.

(c) Separate battery servicing and charging facilities must be provided for lead acid and nickel cadmium batteries.

(d) Stripping and cleaning areas of workshops should be segregated from the assembly and inspection areas.

(e) Workshops should be equipped with the necessary tools and equipment and, where applicable, functional test sets or rigs to enable checks specified in the approved technical publications to be properly completed. In addition, workshops should have adequate bins or racking for components awaiting overhaul or rectification, and suitable benches for dismantling, local cleaning, rectification, inspection, reassembly and test.

8 LINE MAINTENANCE FACILITIES

8.1 The numbers and qualifications of staff at line stations must be sufficient to perform the tasks allocated to the station. Shift arrangements must ensure that persons are available when needed and to ensure continuity of control over servicing and dispatch activities. Arrangements must be made to ensure that on-coming shifts are made fully aware of any outstanding or incomplete task.

8.2 Scheduled or pre-planned tasks must only be allocated to line stations where sufficient staff and down-time are available to perform the task, in a manner commensurate with its airworthiness significance, the working conditions are appropriate to the nature of the task and the necessary tools, equipment, test apparatus and technical instructions are available.

8.3 Each line station must be provided with:

(a) A summary of the technical literature provided for the station. The list should be kept up to date and made available to the technical library so that amendments and periodic checks of currency can be made.

(b) A summary of the station spares holding with an indication of which items are held for priority purposes, e.g. to meet possible MEL compliance requirements or ETOPS dispatches etc.

(c) Company procedures and technical instructions appropriate to the aircraft types supported.

(d) Such extracts from the maintenance schedule, in the form of worksheets or cards etc, as are necessary to perform the tasks allocated to the station.

(e) Access to deferred and repetitive defect information to assist in the diagnosis of reported defects.

(f) Details of any subcontracts for line support, fuel supply, loading and ground handling entered into by the Operator to enable the person responsible for dispatch to ensure that all significant airworthiness tasks are satisfactorily accomplished.

(g) Maintenance facilities and working accommodation appropriate to the scale of work and undertakings of the station.

(h) Ground support equipment as appropriate including equipment or access to equipment for the ground de-icing, anti-icing of aircraft as necessary.

8.4 **Ground De-icing and Anti-icing**

8.4.1 It must be ensured that de-icing equipment is checked immediately before the commencement of winter operations and at intervals throughout the winter season to verify that the equipment is fully serviceable at each location where aircraft are likely to require de-icing.

8.4.2 Items such as mixer nozzles must be correctly calibrated and it must be ensured that they are not replaced with incorrectly calibrated nozzles during the winter season.

8.4.3 Satisfactory procedures for testing mixtures of de-icing fluids must be established together with suitable conditions for the storage and identification of de-icing fluid.

8.4.4 Where facilities for common use are provided at airports or this task is contracted-out to a specialist organisation such audit checks must be carried out by the Operator as are necessary to ensure that de-icing/anti-icing of his type of aircraft will be carried out effectively and in a manner to ensure subsequent safe operation.

8.5 **Balloons**

8.5.1 No scheduled or unscheduled tasks may be carried out on a balloon in the open during adverse weather conditions. All work must be completed in conditions appropriate to the task being undertaken with adequate lighting, heating etc., and such as to avoid ingress of moisture or other contaminants detrimental to the balloon or its components.

8.5.2 Equipment necessary for the completion of work required by the approved maintenance schedule must be available together with any special test equipment needed for the diagnosis and rectification of defects. Where some of the specialist tasks are sub-contracted to another organisation/person, it must be shown that any necessary equipment can be provided on site within a reasonable time period appropriate to the nature of balloon operation.

8.5.3 It is the responsibility of the Operator to ensure that balloons are stored and transported in such a manner, and with adequate protection, so as to ensure continuing airworthiness and security from damage and other deterioration.

CHAPTER 6 – QUALITY CONTROL AND ASSURANCE *

1 GENERAL

1.1 The maintenance organisation's systems for quality control and assurance must take into account all of the facilities and procedures utilised to ensure continued airworthiness, at each of the Operator's locations where activities take place affecting the airworthiness of the aircraft.

1.2 Quality control must therefore be effective throughout the operation and maintenance of aircraft and quality auditing must ensure that control is being properly applied and achieving satisfactory results.

1.3 The organisation's quality control policies and systems must be described in the Exposition or Engineering Manual together with the Quality Assurance audit programme.

2 PROCEDURES

2.1 Staff assigned to quality control and assurance duties must be:

(a) sufficiently experienced in the company systems and procedures and technically knowledgeable of the aircraft being maintained so as to enable them to perform their duties satisfactorily;

(b) experienced in the techniques of quality control and assurance or receive suitable training before taking up their duties;

(c) given clearly defined terms of reference and responsibility within the organisation.

NOTE: This is particularly important where QC/QA personnel are also expected to perform other duties in the organisation, e.g. to issue CMR or other maintenance certification.

2.2 The department responsible for Quality Control and Assurance must arrange for independent quality audit checks to be carried out on a planned basis. Emphasis should be placed on the company systems employed to achieve and ensure airworthiness, their suitability and effectiveness. The scope of quality checks within the organisation should follow the guidelines given at Appendix A to this Chapter.

2.3 All quality checks must be recorded and assessed and any criticisms forwarded to the person responsible for the particular facility or procedure for corrective action to be taken. There must be a feed- back system for confirming to the quality assurance staff that corrective action has been taken and to ensure that persons concerned with any audit deficiency are kept aware of both the adverse report and the outcome.

Quality Control. A management system for programming and co-ordinating airworthiness standards within an organisation to provide for maintenance, overhaul, repair and defect rectification to be accomplished in compliance with JAA/CAA requirements, together with the specific company or customer requirements, and continuing airworthiness.

Quality Assurance. Overall supervision of airworthiness achievement to ensure that the standards set by the system of Quality Control are enforced.

Chapter 6 APPENDIX A – QUALITY CONTROL AND ASSURANCE

1 Quality Assurance procedures should ensure that audit checks are carried out as follows:

NOTE: This summary of quality assurance checks is not exhaustive but is intended to provide an indication of the range of checks necessary.Additional or different checks may be needed in respect of particular support arrangements.

1.1 **Checks on aircraft whilst undergoing scheduled maintenance for:**

(a) compliance with maintenance schedule requirements and ensuring that only worksheets and cards reflecting the latest amendment standard are used,

(b) completion of worksheets, including the transfer of defects to additional worksheets; their control, and final assembly. Action taken in respect of items carried forward, not completed during the particular inspection or maintenance task,

(c) compliance with manufacturers' and company standard specifications,

(d) standards of inspection and workmanship,

(e) conservation of aircraft corrosion prevention techniques and other protective processes,

(f) procedures adopted during shift-changeover to ensure continuity of inspection and responses,

(g) precautions taken to ensure that all aircraft are checked, on completion of any work or maintenance, for loose tools and miscellaneous small items such as split pins, wire, rivets, nuts, bolts and other debris, general cleanliness and housekeeping.

1.2 **Checks on aircraft in service for:**

(a) compliance with company approved practices for cargo restraint, load distribution and spreading such that the approved modifications for cargo configurations are observed,

(b) procedures to ensure that the APS weight data in use reflects the aircraft configuration and the weight and balance schedule,

(c) satisfactory condition of cargo/baggage compartments and their linings, cargo handling and restraint equipment and special provisions for the carriage of livestock and attendants,

(d) continuing compliance with CAA Airworthiness Notices in respect of cabin and other safety provisions. (See paragraph 24 Chapter 4).

1.3 **Checks on Technical Logs for:**

(a) correct completion of sector record pages and their transmission to technical records,

(b) satisfactory rectification of defects or their deferral in accordance with the MEL and company procedures. The recording of component details and stores control numbers, cross-referencing to deferred defect records and additional worksheets where appropriate and the inclusion of rectification details in the Sector Record Page,

Chapter 6 APPENDIX A (cont'd)

(c) compliance with required reporting procedures in the event of flights taking place after rectification of defects without issue of a Certificate of Release to Service,

(d) certification of modifications including the installation of role equipment such as stretchers and conversion of the aircraft from passenger to cargo roles, and return to passenger,

(e) correct use of maintenance and inspection control systems included in the technical log for the completion of scheduled and pre-planned tasks between Scheduled Maintenance Inspections,

(f) operation of systems for recording external damage to the aircraft which has been inspected and is considered safe for further operation.

1.4 **Checks on Technical Service Information for:**

(a) adequacy of aircraft manuals and other technical information appropriate to each aircraft type, including engines, propellers and other equipment, and the continuing receipt of revisions and amendments,

(b) assessment of manufacturers service information, determining its application to the Operator's aircraft and the recording of compliance or embodiment in each aircraft,

(c) maintaining a register of manuals and technical literature held within the company, their locations and current amendment states,

(d) ensuring that all company manuals and documents, both technical and procedural, are kept up to date.

1.5 **Checks on the Company's general Airworthiness Control Procedures for:**

(a) responding to the requirements of Airworthiness Directives, mandatory modifications and inspections, CAA Airworthiness Notices and special fleet checks instituted in response to occurrences etc,

(b) monitoring company practices in respect of scheduling or pre-planning maintenance tasks to be carried out in the open, and adequacy of the facilities provided,

(c) effective completion of maintenance reviews at intervals required by the approved maintenance schedule and the availability of information to the certificate signatory,

(d) operation of the defects analysis system for the Operator's airframes, engines and systems and its integration with the system for mandatory occurrence reporting; the highlighting of repetitive defects and the control of deferred defects,

(e) authorisation of personnel to perform inspections and maintenance tasks on the Operator's aircraft and for the issue of CMR and CRS; the effectiveness and adequacy of training and the recording of personnel experience, training and qualifications for grant of authorisation,

(f) the effectiveness of technical instructions issued to maintenance staff,

Chapter 6 APPENDIX A (cont'd)

(g) the adequacy of staff in terms of qualifications, numbers and ability in all areas of support for the Operator which affect airworthiness,

(h) the efficacy and completeness of the quality audit programme.

(j) compliance with the requirements of the approved Maintenance Schedule, including maintenance/inspection periods, component overhaul/test/calibration control, records of cycles/landings etc and for granting variations at the request of the Operator,

(k) maintaining logbooks and other required records on behalf of the Operator,

(l) ensuring that major and minor repairs are only carried out in accordance with approved repair schemes and practices.

1.6 **Checks on Stores and Storage Procedures for:**

(a) the adequacy of stores and storage conditions for rotable components, small parts, perishable items, flammable fluids, engines and bulky assemblies,

(b) the procedure for examining incoming components, materials and items for conformity with order, release documentation and approved source,

(c) the 'batching' of goods and identification of raw materials, the acceptance of part life items into stores, requisition procedures,

(d) labelling procedures, including the use of serviceable/unserviceable/repairable labels, and their certification and final disposal after installation. Also labelling procedures for components which are serviceable but 'part life' only,

(e) the internal release procedure to be used when components are to be forwarded to other locations within the organisation,

(f) the procedure to be adopted for the release of goods or overhauled items to other organisations. (This procedure should also cover items being sent away for rectification or calibration),

(g) the procedure for the requisitioning of tools together with the system for ensuring that the location of tools is known at all times,

(h) control of shelf life and storage conditions in the stores. Control of the free-issue dispensing of standard parts, identification and segregation.

1.7 **Checks on Maintenance Facilities for:**

(a) cleanliness, state of repair and correct functioning of hangars, hangar facilities and special equipment, and the maintenance of mobile equipment,

(b) adequacy and functioning of special services and techniques including welding, NDI, weighing, painting,

(c) viewer/printer equipment provided for use with micro-fiche, micro-film and compact disk ensuring regular maintenance takes place and an acceptable standard of screen reproduction and printed copy are achieved,

(d) the adequacy of special tools and equipment appropriate to each type of aircraft, including engines, propellers and other equipment.

Chapter 6 APPENDIX A (cont'd)

1.8 **Checks at Line and Route Stations, in addition to the foregoing as applicable for:**

(a) the adequacy of facilities and staff,

(b) the provision of covered accommodation for aircraft when maintenance is undertaken which requires a controlled environment, and for the accomplishment of work in the open where this is unavailable,

(c) the cleanliness, state of repair, correct functioning and maintenance of ground support equipment including ground de-icing/anti-icing equipment,

(d) the effectiveness of any sub-contracted arrangements for ground handling, servicing and maintenance support and compliance with the operator's contracted arrangements,

(e) quality monitoring of fuel supplies including supplier checks and uplift contamination checks; the effectiveness and completion of fuel tank water drain checks,

(f) the care and maintenance of cargo containers, freight nets, pallets and other cargo equipment,

(g) the currency, scope and effectiveness of locally raised technical instructions and the procedure for bringing them to the notice of maintenance personnel,

(h) adequacy of the technical publications held at the station for the operator's aircraft, their currency and procedures for amendment,

(j) the accuracy and control of worksheets or cards, to ensure that only up-to-date issues are used.

CHAPTER 7 – THE ENGINEERING MANUAL

1 GENERAL

1.1 The Operator is required to provide a description of his maintenance support arrangements for the direction and guidance of flight crew and maintenance personnel engaged in the day to day operation and maintenance support of his aircraft, throughout his operating network.

The manual is also required as a basis for CAA acceptance of the arrangements, a pre-requisite for the grant of an AOC.

1.2 For the purposes of CAP 360 Part Two this description of the arrangements will be referred to as the ENGINEERING MANUAL but may take other forms in practice, as defined in this Chapter.

1.3 The Operator may:

(a) publish a discrete Engineering Manual containing a full description of the support provided for his Operation or,

(b) use the Operations Manual to satisfy the requirement for an Engineering Manual including the necessary details as a Volume, Section or Chapter of that manual as appropriate and he may:

(c) refer in his manual to the Exposition of the approved maintenance organisation for those parts of the maintenance arrangements which are described therein or,

(d) he may use the Exposition to describe the whole of his maintenance arrangements.

1.4 Where the Operator's maintenance organisation does not hold JAA or CAA Approval, or holds an approval for which an Exposition is not required, the CAA will accept a document prepared by that organisation as a substitute provided it conforms to the requirements for an Exposition.

1.5 The CAA will require to hold copies of the Manual as dictated by the nature of the operation and the necessary surveillance.

1.6 Operators of balloons may utilise a section of the Operations Manual to describe all of their maintenance arrangements.

2 PREPARATION OF THE MANUAL

2.1 The purpose of the Engineering Manual is to describe the maintenance arrangements made by the Operator to support his operation, in accordance with the requirements of this CAP 360, Part Two. The contents of the Manual should therefore address all of the subjects included in this document. The Contents List given at the front of this document may be used as a summary of subjects to be included in the Engineering Manual.

2.1.1 Whether details appear in the Operator's engineering manual or in the maintenance organisation's Exposition will depend on the nature of the relationships between the two parties.

2.2 It is apparent from the foregoing that the Operator will need to liaise closely with his maintenance organisation in the preparation of his Engineering Manual, to take advantage of those aspects of his maintenance support which are adequately described in the Exposition.

2.3 It is recommended that the Engineering Manual is divided into parts appropriate to the functions of maintenance. The Exposition in particular should be divided between main base and line maintenance functions and may be further sub-divided for ease of use and to facilitate its management.

2.4 In preparing the Manual account should be taken of CAA publications and other sources of information, including:

CAP 74 Aircraft fuelling – fire prevention and safety measures for the fuelling of aeroplanes and helicopters

CAP 382 The Mandatory Occurrence Reporting Scheme

CAP 418 Condition Monitored Maintenance

CAP 434 Aviation Fuel at Aerodromes

CAP 455 Airworthiness Notices

CAP 512 Ground De-icing of Aircraft

CAP 513 Extended Range Twin Operations

CAP 520 Light Aircraft Maintenance

CAP 553 and CAP 554 BCAR Sections A and B

CAP 549 Master Minimum Equipment Lists (MMEL) and Minimum Equipment Lists (MEL)

CAP 562 Civil Aircraft Airworthiness Information and Procedures

Notices to AOC Holders

Aeronautical Information Circulars

JAR–145 Approved Maintenance Organisations

2.5 Where a maintenance organisation provides all or part of the support for more than one Operator it should be possible to clearly identify the support provided for each operator in the Engineering Manual or Exposition.

CHAPTER 8 – THE TECHNICAL LOG

1 GENERAL

1.1 A Technical Log is required to be kept for any aircraft with a Certificate of Airworthiness in either the Transport or Aerial Work Category and at the end of every flight (except as indicated below) the aircraft commander must enter the following details:

1.1.1 The times when the aircraft took off and landed.

1.1.2 Particulars of any defect known to him if it affects the airworthiness or safe operation of the aircraft, (if there are no defects the aircraft commander must make an entry to this effect).

1.1.3 Any other particulars required by the CAA.

1.1.4 His/her signature and the date.

1.2 If the aircraft is 2730 kg or less MTWA and is not operated by the holder of an AOC (or by a person who is required to hold an AOC) the CAA may approve a different record (see paragraph 5 'Alternative Records').

1.3 If a number of consecutive flights occur within the same period of 24 hours at the same aerodrome with the same aircraft commander, all entries may be made at the end of the last flight unless a defect becomes known to the commander in the meantime, which must be entered as it occurs.

2 CAA REQUIREMENTS

2.1 In addition to the particulars required by the Air Navigation Order, as indicated above, the Technical Log may contain maintenance control and Flight Crew advisory information for use during the routine operation of the aircraft between scheduled maintenance inputs to main base.

2.2 The log must contain pre-serialised Sector Record Pages of a design acceptable to the CAA, provision to record acceptable deferred defects which are awaiting rectification, a valid Certificate of Maintenance Review and a Maintenance Statement.

2.3 A specimen Certificate of Maintenance Review is shown at Appendix G.

3 THE SECTOR RECORD PAGE

3.1 Each sector record page must include provision to record:

(a) The aircraft type and registration.

(b) The date, place and times of take-off and landing.

(c) The name and address of the Operator (the address may be omitted if it is printed on the title page to the log).

(d) Particulars of defects.

(e) The post-flight signature of the aircraft commander and the date.

(f) The fuel state on arrival.

(g) Details of rectification action taken in respect of defects together with a pre-printed Certificate of Release to Service (CRS) in such a position as to be readily identifiable with the defect entry to which it relates. (Provision should also be made for CRS signature with the date and authority for issue).

(h) The quantities of fuel and oil uplifted and the quantity available in each tank or combination of tanks at the beginning of each flight. (See Note.)

NOTE: The format in which fuel quantities are recorded must encourage the identification of any gross errors present in the quantity of fuel on board, e.g. by comparison of the calculated and actual fuel uplifted, using the recorded fuel on arrival. Common units of quantity should be used within columns or provision should be made in the record for the conversion of units to a standard.

(i) The running total of flying hours so that the flying hours remaining to the next inspection can be readily determined, and the date of such inspection.

(j) The completion of preflight and/or daily inspections.

(k) The times when de-icing was started and completed, unless otherwise agreed with the CAA.

3.1.1 It may also be necessary to record additional information for specific aircraft. Examples include:

(a) *Maximum or Intermediate Contingency Power.* It is necessary to record the duration of maximum and intermediate contingency power usage, and subsequently to transfer the information to the engine log book or maintenance record. For rotorcraft the record of each use of such power settings must also subsequently be transferred to the log cards or other appropriate documents applicable to those components of the transmission which always transmit the power from a single engine only, i.e. components upstream of any combining gearbox.

(b) Landings.

(c) Flight Pressure Cycles.

3.1.2 This list is not exhaustive and additional records may be required. The supplementary information to be recorded should be assessed by the Operator in consultation with the relevant maintenance organisation and submitted for agreement to the CAA.

3.2 The Sector Record Page layout should be divided to show clearly what is required to be completed after flight and what is required to be completed in preparation for the next flight.

3.3 Typical layouts for Sector Record Pages are shown in the Appendices to this Chapter:

Appendix A Multi Sector record

Appendix B Single Sector light aircraft record

Appendix C Single Sector large aircraft record

Appendix D Balloons

4 RETENTION OF RECORDS

4.1 All entries made on a Sector Record Page must be made in duplicate with provision for one copy of each entry to be removed from the Technical Log and retained on the ground before the next flight commences.

4.1.1 In the case of an aeroplane not exceeding 2730 kg MTWA or a helicopter, if it is not reasonably practicable for a copy of the Sector Record Page to be kept on the ground, it may be carried in the aeroplane or helicopter in a container approved for the purpose by the CAA.

4.2 Arrangements must be made to extract information recorded in the Sector Record Page for use by the maintenance organisation. Additional copies of the page may be necessary for this purpose.

4.3 All entries in the Sector Record Page must be retained by the Operator for a period of not less than two years after the particular aircraft has been destroyed or permanently withdrawn from service except that the CAA may consider a different retention period in a particular case.

4.3.1 Where the Operator arranges for the relevant maintenance organisation to retain copies of Sector Record Pages on his behalf he will nevertheless continue to be responsible for the records under the ANO Article relating to the preservation of records. If he ceases to be the operator of the aircraft he also remains responsible for transferring the records, if requested, to any other person who becomes the Operator of the aircraft.

5 ALTERNATIVE RECORDS

5.1 In circumstances when the operator of an aircraft with a Certificate of Airworthiness in the Transport Category is permitted to use an alternative form of record the following arrangements must be made if the aircraft undertakes a flight or flights for the purpose of public transport. The pertinent details must be transferred to the Sector Record Page from the Alternative Record, including:

(a) Total flight hours.

(b) Hours to next maintenance check and date of such check.

(c) Any acceptable deferred defects awaiting rectification. (It is strongly recommended that the standard record of deferred defects is utilised for all aircraft, whether a full Sector Record Page or Alternative Record is used, see Appendix E).

(d) Any maintenance actions falling due before the next scheduled maintenance inspection (see paragraph 7, Maintenance Statement).

When the aircraft returns to non-AOC flying the above details must be transferred to the alternative record to ensure continuity of maintenance control.

NOTE: The form of alternative record must be approved by the CAA. Operators are advised to contact the CAA for guidance before considering the adoption of such a record.

5.2 Alternative records and any Sector Record Pages completed during the period must be made available to the maintenance organisation when the aircraft is presented for the accomplishment of scheduled maintenance so that a full assessment of the maintenance needed by the aircraft can be verified.

5.3 Use of an alternative record does not alter the Operator's responsibilities for recording defects as they become known to the Commander and for their rectification. Where defects are deferred, or transferred to aircraft log books for entry of rectification details and issue of CRS, detailed cross-referencing must be included so that continuity of maintenance actions can be established.

6 ACCEPTABLE DEFERRED DEFECTS

6.1 A procedure for deferring the rectification of defects where this is permitted by the Minimum Equipment List (MEL) for that aircraft should be published in the Operations Manual and engineering Technical Procedures. A suitable record sheet for this purpose is shown at Appendix E, however, Operators may develop procedures and records more suited to their methods of defect control, and to permit, for example, recording of rectification attempts and component replacement.

6.2 The CAA will investigate operator's procedures for deferring defects at the time of application for an AOC to ensure that they will be effective, in practice, and result in defects remaining unrectified for minimum periods. Any change in procedures must be notified to the CAA for further investigation.

6.3 When a defect is to be transferred, the 'Action Taken' column of the Sector Record should be completed in the following manner:

Transferred to ADD Record sheet serial No ..... Item No .....

Signed .....

Date .....

6.3.1 Details of the defect, Sector Record page serial number, signature of person authorising deferrment and date (or aircraft hours) of origin, should be entered on the ADD Record. The period for which the deferred defect may be carried should also be stated in accordance with the company procedure.

6.3.2 On rectification of the defect it is necessary to enter on the current Sector Record page:

(a) the ADD Record sheet serial number and item number,

(b) details and date of the original defect and of the rectification, together with the applicable component change date or other action, and to Complete the Certificate of Release to Service. The 'Defect Cleared' columns of the ADD Record must then be signed and dated.

6.4 Completed ADD Records may be removed from the Technical Log at each Scheduled Maintenance Inspection. Where single defects remain current on each page, resulting in numerous pages being carried in the log it is acceptable to consolidate these entries on to a single page for ease of assessment by the crew. When this occurs the original date of entry must be retained so that the duration of entry can be readily established.

6.5 Where deferred defects are transferred to worksheets at maintenance periods there should be a procedure to ensure that defects which have not been actioned are re-entered on a new deferred defect record sheet, ensuring that the original date of the defect is retained.

7 THE MAINTENANCE STATEMENT

7.1 The purpose of the Maintenance Statement is to advise the Aircraft Commander and maintenance personnel of the forthcoming maintenance requirements.

7.2 The statement is to be completed by the maintenance organisation following each scheduled maintenance inspection and should include details of all out-of-phase inspections and component changes etc., falling due prior to the next SMI. Where these are too numerous to include in a Maintenance Statement or the Operator wishes to provide for repeated inspections, etc., alternative procedures and recording systems may be adopted with the agreement of the CAA.

NOTE: Where scheduled maintenance inspections may be completed as a line maintenance function the Maintenance Statement may be of a form which enables the accomplishment of such minor inspections within the overall validity period of the Statement.

7.3 A specimen Maintenance Statement is shown at Appendix F.

8 PROCEDURES

8.1 Detailed instructions should be given to flight crew in the Operations Manual and to maintenance engineers in Engineering Manuals on the manner in which the Technical Log is to be used and completed. These should be repeated in the Log itself if necessary to ensure a disciplined response by pilots and engineers.

8.2 Specific guidance should be given in respect of special inspections, Line Maintenance Requirements, Notices to Crew, External Damage Recording systems and compliance with short-term mandatory requirements etc., which may also be included in the Technical Log.

8.3 As a general rule one legible copy of each Sector Record Page should remain in the log for a sufficient period to permit the identification of a repetitive defect by maintenance engineers at the point of operation. Similarly deferred defect records should not be removed prematurely. It will be necessary to ensure a balance exists between permitting a degree of defect analysis on the aircraft on the one hand and preventing a situation in which too many pages, particularly of deferred defects, obscures the airworthiness status of the aircraft.

8.4 In cases when the copy of the Sector Record Page provided for maintenance control is not extracted directly by the maintenance organisation, Operations Manual procedures must show the responsibilities of the Operator for removing and dispatching completed pages to that organisation. It is essential that details of flights undertaken and any defects, whether rectified or deferred are advised promptly to the maintenance organisation, so that maintenance planning and spares provision can be effective.

9 FLIGHTS WITH UNCERTIFIED RECTIFICATION OF DEFECTS

9.1 The Air Navigation Order permits an aircraft to be flown to a place where a Certificate of Release to Service can be issued for the rectification of a defect when the aircraft is at a place where it is not reasonably practicable to do so.

9.2 If such a flight is undertaken the Commander of the aircraft must notify the CAA within ten days, giving particulars of the flight and the reasons for making it. The flight itself must be to the nearest place where the necessary certification can be made, it must be flown by a route for which it is properly equipped, and must take into account any hazards to the liberty or health of the persons on board.

9.2.1 All reports should be addressed as noted below. Any operational aspects will then be coordinated with the assigned Flight Operations Inspector. Reports should include the following details:

(a) Aircraft Type, Registration, Date, Time, Place and Flight Number.

(b) Technical Log reference for Sector Record Page on which the defect is recorded, and the deferred number.

(c) Description of Defect and Rectification

(d) Person/Organisation who carried out the work, and confirmation that the Operator's maintenance organisation was consulted and authorised this course of action.

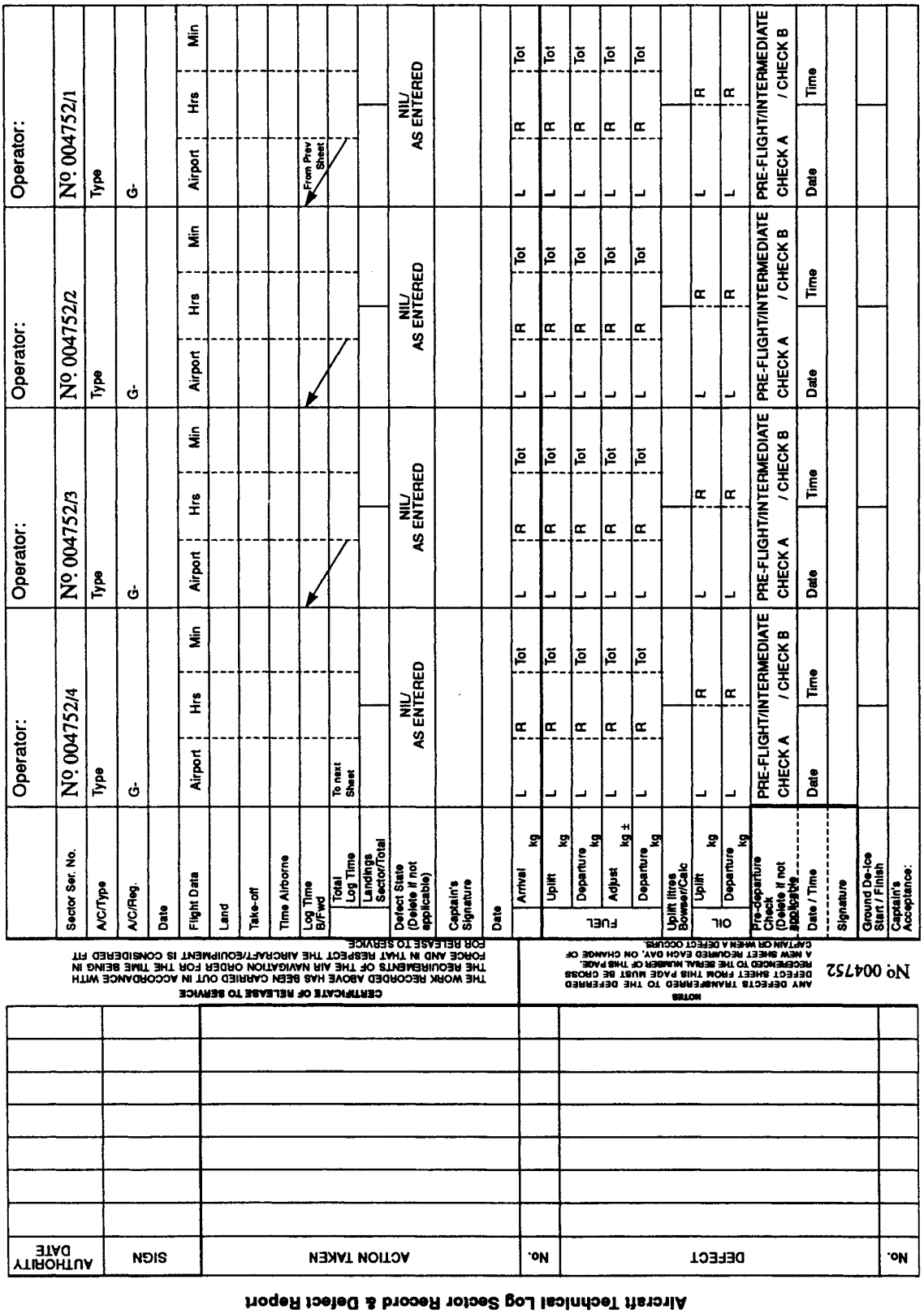
(e) Whether or not a duplicate inspection was necessary and, if so, who carried it out.

(f) An indication of whether normal operation of the aircraft was affected (altitude, route, etc).

(g) Name and signature of the aircraft commander.

NOTE: Reports should be addressed to the CAA, Safety Regulation Group, Flight Operations Department, AOC Maintenance Office. It is recommended that Operators prepare a reporting form with provision for entering the above information and arrange for copies to be available to the flight crew.

Chapter 8 APPENDIX A – Multi Sector Record



Operator: Serial Nº 001

Date	Captain	Aircraft Registration	Type

HOURS TO CHECK BROUGHT FORWARD	
SUBTRACT	

FROM	TO	TAKE-OFF	LAND	TIME AIRBORNE

HOURS TO CHECK CARRY FORWARD	

No.	Defects	No.	Action Taken inc Component Details	Sign/Auth/Date

DATE OF NEXT CHECK ____/____/____

	FUEL kg				OIL	
	PORT		STBD		(litres)	
	Aux	Main	Main	Aux	Port	Stb
Arrival						
Uplift						
Departure						
Adjust ±						
Departure						

Signature

Captain Inbound Flight

CERTIFICATE OF RELEASE TO SERVICE – The work recorded above has been carried out in accordance with the requirements of the Air Navigation Order for the time being in force, and in that respect the aircraft/equipment is considered fit for Release to Service.

FUEL UPLIFT CHECK (ltr)	REFUEL VEHICLE:	CALCULATED:

DATE	FROM	TO

GROUND DEICING
(if applicable)

Commenced GMT

Finished GMT

Signature

CHECK/PREFLIGHT INSPECTION, CARRIED OUT.
N.B. Check A. Before 1st flight of day only

Time GMT

Signature

CAPTAINS ACCEPTANCE CERTIFICATE
Captains signature confirms fuel/oil state, defect and rectification state and hours to next check all satisfactory before flight.

Signature

Notes: (1) This is a specimen only. Operators may need to change the layout or introduce additional items to suit their individual requirements.

Operator ..... Captain .....

A/C Reg.	Date:	Serial No:

No.	Defects	Action Taken inc. Component Details	Sign/Auth/Date

Flight No:		Hrs	Min
To	Land		
From	T.O.		
Airborne Time			
Total Log Time B/F			
Total Log Time			
No. of Landings			

Inspection Type Completed .....

Time ..... Date .....

Signature .....

Oil Topped Up .....

Refuelled by .....

NOTE: I hereby certify that the amounts of fuel and oil stated are on board this a/c at time of departure.

Total Fuel on Board ..... kg

Name ..... Sign .....

CAPTAINS ACCEPTANCE OF AIRCRAFT & REPLENISHMENT LOG

Name ..... Sign .....

Date .....

NOTE: ANY DEFECTS TRANSFERRED TO THE DEFERRED DEFECT SHEET FROM THIS PAGE MUST BE CROSS REFERENCED TO THIS PAGE.

Use of Max Contingency Power:

Use of Int. Contingency Power:

Signed ..... Captain (inbound)

CERTIFICATE OF RELEASE TO SERVICE – The work recorded above has been carried out in accordance with the requirements of the Air Navigation Order for the time being in force, and in that respect the aircraft/equipment is considered fit for Release to Service.

FUEL RECORD:

	PORT			STBD		kg
	3	2	1	1	2	3	TOTAL
Arrival							
Uplift							
Depart	3	2	1	1	2	3	TOTAL
							kg
Adjust ±							
Depart							

*Water Methanol

1	2	3	4	TOTAL

Fuel Uplift Check (litres)

Refuelling Vehicle:	Calculated:

*State Units

Ground De-Icing (if applicable)
Commenced .....
Finished .....
Signature .....

*OIL RECORD

1	2	Eng	3	4
		Uplift		
		Total		

* Oil	Acc. G/Box			
	1	2	3	4
Uplift				
Total				

NOTES: (1) This is a specimen only. Operators may need to change the layout or introduce additional items to suit their individual requirements.

Chapter 8 APPENDIX D – Balloons

Technical Log Sector Record Page
Loadsheet and Passenger Manifest

Serial No.

Operator	Reg. G-

Passenger Name	Wt. lb
1	
2	
3	
4	
5	
6	
7	
8	
Total Weight +	

Permitted Lift Calc	
Datum Temp	C
Press Alt	ft
Max lift/1000 cu/ft	
	lb
Balloon Volume	
	cu/ft
Total Permitted Lift	
	lbs

Captain	Date

	Place	Time
Dep		
Arr		

Hours to Check BF	
Hours this page –	
Hours to Check =	
Date Check Due	

Fuel Calculation	
Planned Duration	:
Fuel Required	

Check A Carried out
Sign
Date

Total Fuel at Dep +		lb
Empty Weight +		
Total Lift Reqd =		

Fuel Certificate
Sign

Compare with Total Permitted Lift

Loading Certificate
Sign
Date

Departure Weather	Source	Time			
Wind	Vis	WX	Cloud	Temp	QNH

NIL DEFECTS *	Capts Signature	Date

No.	Defect	Action Taken

CERTIFICATE OF RELEASE TO SERVICE – The Work recorded above has been carried out in accordance with the requirements of the Air Navigation Order for the time being in force, and in that respect the balloon/equipment is considered fit for release to Service.	Item Nos.	Signed	Authority	Date

*Strike out if a defect entry is made

Chapter 8 APPENDIX E – Deferred Defect Record Page

Serial No.

A/C Reg. G

DEFERRED DEFECT DETAILS FROM SECTOR RECORD					DEFECT CLEARED			
No.	Sector Record Page No.	Defect	Signed	Date	Defect Deferred to (state limit)	Sector Record Page No.	Signed	Date

Before the Defect Cleared sections of this page are completed, details of the deferred defect, its number, the sector record page number, together with rectification action, *must* be recorded and certified on the current sector record page to provide a duplicate record.

Chapter 8 APPENDIX F – Maintenance Statement

MAINTENANCE STATEMENT

Aircraft Type: Registration Mark:

The next SCHEDULED MAINTENANCE INSPECTION is due at: hrs

on:

The following out of phase inspections/component changes are due before the next Scheduled Maintenance Inspection specified above:

Item	Due		Sector Log Reference on Completion
	Hrs	Date	

This maintenance statement is not complete unless a valid Certificate of Maintenance Review is attached.

Chapter 8 APPENDIX G – Certificate of Maintenance Review

CERTIFICATE OF MAINTENANCE REVIEW

Aircraft Type: .....

Registration Mark: .....

Certified that a maintenance review of this aircraft and such of its equipment as is necessary for its airworthiness has been carried out in accordance with the requirements of the Air Navigation Order for the time being in force.

The next maintenance review is due .....

Signed .....

CAA Approval/Licence .....

Date .....

Firm .....

SUBJECT INDEX

This index provides simplified access to subjects included in the text. It does not necessarily cover every occasion that subjects are mentioned nor is it intended as a definitive summary of the contents for which reference must be made to the list of contents at the beginning of the document.

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Working Accommodation		5 2.1
Workpack Control	4 13.4	4 13.3
Workshops		
– Approval		5 7.1
– Maintenance Workshops	5 7.3	5 7.2

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