

BGA AIRWORTHINESS AND MAINTENANCE PROCEDURES
MANUAL

PART 3

PROCEDURES APPLICABLE TO SAILPLANES AND
SELF-SUSTAINING POWERED SAILPLANES

CONTENTS

<u>Leaflet No</u>	<u>Subject</u>	<u>Revision</u>
3-1	Initial Issue of BGA Certificate of Airworthiness	Nov 05
3-2	Renewal of BGA Certificate of Airworthiness	Jun 02
3-3	Modification Procedure	Dec 09
3-4	Design and Certification Procedures for Homebuilt Sailplanes	Dec 00
3-5	Maintenance Certification	Jun 02
3-6	Return to service of Parts or Equipment Recovered from Gliders Involved in Accidents or Incidents	Jan 02
3-7	Registration and C of A issue for Gliders and Self Sustaining Sailplanes	Nov 05

BGA AIRWORTHINESS AND MAINTENANCE PROCEDURES

PART 3, LEAFLET 3-1

INITIAL ISSUE OF A BGA CERTIFICATE OF AIRWORTHINESS

INTRODUCTION

IMPORTANT NOTE

1. All sailplanes operated from BGA gliding clubs are required to hold either a BGA C of A or other acceptable equivalent C of A or Permit to Fly.

2. The first action is to contact the BGA and reserve a registration number and tri-graph. The BGA number is to be used in all correspondence with the BGA and on application forms.

Prior to first issue of a BGA C of A the glider must be registered with the CAA and display CAA registration marks. AMP Leaflet 3-5 contains useful information on the registration process.

INITIAL ISSUE PROCESS – EASA APPROVED TYPES (New or Used)

3. New aircraft will require an acceptance check, on used aircraft it will be necessary to carry out an annual check and C of A inspection, all must be certified by an appropriately rated BGA inspector; the work should be certified on the BGA 267 form and 267T for self sustainers. If the aircraft is not new, a thorough examination of the log books and records to establish the aircraft's history and determine compliance with mandatory inspections or modifications.

4. The aircraft should be checked for compliance with all BGA airworthiness requirements including;

- a) Colour coding of controls,
- b) Instrument presentation and calibration,
- c) Compass swing and deviation,

5. The aircraft should be weighed on import and a Weight and Centre of Gravity Schedule produced in English. (The factory weighing report is acceptable for new aircraft)

6. A 30-day ticket may be applied.

7. The C of A paperwork should be forwarded to the BGA for processing; the following documents are required;

- a) BGA 267
- b) BGA 267 T (Self Sustaining Sailplanes)
- c) Weight and C of G schedule in English
- d) Export C of A issued within the previous 60 days or Current domestic EU C of A from exporting country or renewed within the previous 60 days or EASA Form 52.
- e) Aircraft from outside the EU will require an Export C of A in all cases.
- f) Current C of A fee

g) Any other supporting reports or documentation

8 The BGA will issue a temporary C of A in accordance with the temporary exemption granted by the Department for Transport.

9 All gliders issued with a BGA C of A after 28 September 2003 will be required to obtain an EASA C of A on expiry of the DfT temporary exemption.

10 Until further notice and until EU regulation 1592/2002 Annex II is finalised only EASA approved or accepted new or used types may be issued with a BGA C of A.

11 It is not permissible to incorporate any BGA approved modifications on gliders imported after 28 September 2003.

12 BGA extended weight operations are not applicable to gliders imported after 28 September 2003

GLIDERS WITH EU PERMIT TO FLY OR PROVISIONAL C of A

13 Gliders issued with an EU Permit to Fly or Provisional C of A may operate in within the UK provided the document is validated. The BGA is able to do this whilst the temporary DfT exemption is in force. These documents are for aircraft not certified to an internationally recognised standard or whilst the final stages of certification are being completed.

14 Application for the validation should be made on form BGA 217 accompanied by a copy of the permit and the normal C of A fee as an administration charge.

15 The aircraft will remain registered in the country that issued the permit to fly and all maintenance must be certified by an appropriately authorised engineer approved by the country of registry.

16 Visitor applications for permit validation should be forwarded to the CAA.

BGA AIRWORTHINESS AND MAINTENANCE PROCEDURES

PART 2, LEAFLET 3-2

RENEWAL OF BGA CERTIFICATES OF AIRWORTHINESS (AND PERMITS TO FLY)

INTRODUCTION

1. This leaflet describes the renewal procedures for a BGA Certificate of Airworthiness (C of A) or Permit to Fly.

EXTENSION OF BGA CERTIFICATE OF AIRWORTHINESS.

2. The C of A may only be extended with the written permission of the CTO or Technical Committee. This is intended as a planning tool to overcome occasional timing difficulties. Strict controls are maintained on this process and mandatory inspections that fall other than at the C of A must be complied with. The extension need not be deducted from the next maintenance period. The extension is accomplished by the application of a 30-day ticket only after receiving written permission. This may be in the form of letter or e-mail and details are placed in the aircraft file held by the BGA should an insurance company or other third party require confirmation.

RENEWAL OF BGA C OF A

3. The Certificate of Airworthiness is renewed annually and the aircraft will require an annual check and C of A inspection certified by an appropriately rated BGA inspector. The inspection should be certified using the BGA 267 series forms. The inspection should include all the applicable items on the BGA 267 form. Items which are not applicable to the subject aircraft should be entered as N/A.
4. Compliance with mandatory inspections and modifications should be checked against the BGA Annual Compendium and BI-monthly Technical News Sheets. If the aircraft is equipped with a Self Sustainer engine BGA 267 T should be used in addition to the BGA 267.
5. Determine if the aircraft requires weighing, the maximum interval being 8 years. The aircraft must also be reweighed after significant repair or refurbishment work or if the weight and balance details are believed to be suspect in any way. Thereafter the weight and centre of gravity schedule must be compiled and the appropriate loading placards fixed in the cockpit.
6. On completion of the workpack the appropriate log book entries must be completed and a 30-day ticket issued. Any significant repair reports must be completed and a copy forwarded to the BGA with the renewal documentation.
7. Send the following documents to the BGA as soon as possible for processing;
- a) 1 copy of the 267 (and 267 T) forms.
 - b) Expiring C of A document.
 - c) Copy of weight and balance if re-weighed or requested
 - d) Details of any significant repairs.
 - e) Current C of A fee.

8. The C of A renewal procedure will normally take approximately 2 weeks by the BGA including postage. If the process is delayed for whatever reason and the 30-day ticket is due to expire, another 30-day ticket may only be applied with the permission of the CTO or Technical Committee.

PERMIT TO FLY RENEWAL PROCEDURE

9. The renewal procedure is the same as for Certificate of Airworthiness with the following amendments;

10. 30-day tickets may not be applied without the permission of the CTO.

11. The Permit to Fly may have special limitations i.e. specified pilot or limited expiry date.

12. If the Permit to Fly has expired for an extended period of time, say due to flight testing not being completed or similar event, then the Permit to Fly can only be renewed on the authority of the Technical Committee. At the technical Committees discretion the Permit to Fly and certification process may have to be restarted or refusal to renew if it the type is considered unsuitable for BGA type approval.

BGA ACTION FOR C of A RENEWAL

13. Once the C of A is renewed the BGA will return the C of A document and a C of A sticker to the inspector unless directed otherwise.

14. The C of A sticker must be placed in the aircraft in place of the 30-day ticket.

BGA AIRWORTHINESS AND MAINTENANCE PROCEDURES

PART 3, LEAFLET 3-3

MODIFICATION PROCEDURE FOR GLIDERS, SAILPLANES AND SELF SUSTAINING SAILPLANES

APPLICABLE TO ANNEX II AIRCRAFT ONLY

INTRODUCTION

1. Modifications to BGA Annex II (including BGA non transitioned) gliders, sailplanes and self sustaining sailplanes fall into two main categories; **minor** and **major**, and then **requiring approval** and **not requiring approval** for minor modifications.
2. All major modifications to BGA aircraft require BGA Technical Committee or aircraft manufacturers approval. The definition of a major modification is one that requires a significant change to the flight manual, a major structural alteration, addition of a self sustainer engine, conversion from fixed to retracting undercarriage or where changes to the flight characteristic are proposed and such like modifications.
3. Minor modifications, depending on complexity either will or will not require approval.
 - a) **Modifications requiring approval**; installation of tailwheels, wheel brake conversions, winglets, canopy operation, seating and harnesses, substitution of structural components or materials, disabled pilot conversions.
 - b) **Modifications not requiring approval**: instrumentation and avionics fit, mountings for removable equipment such as GPS or cameras, non-structural substitution, cosmetic modifications.
Modifications that fall into the ‘not requiring approval’ category must be assessed to ensure they comply with section 10 of this leaflet.
4. Modifications to EASA aircraft require EASA approval in the form of a technical note or approved modification approved by the manufacturer a design company (DOA) or EASA

APPLICATION

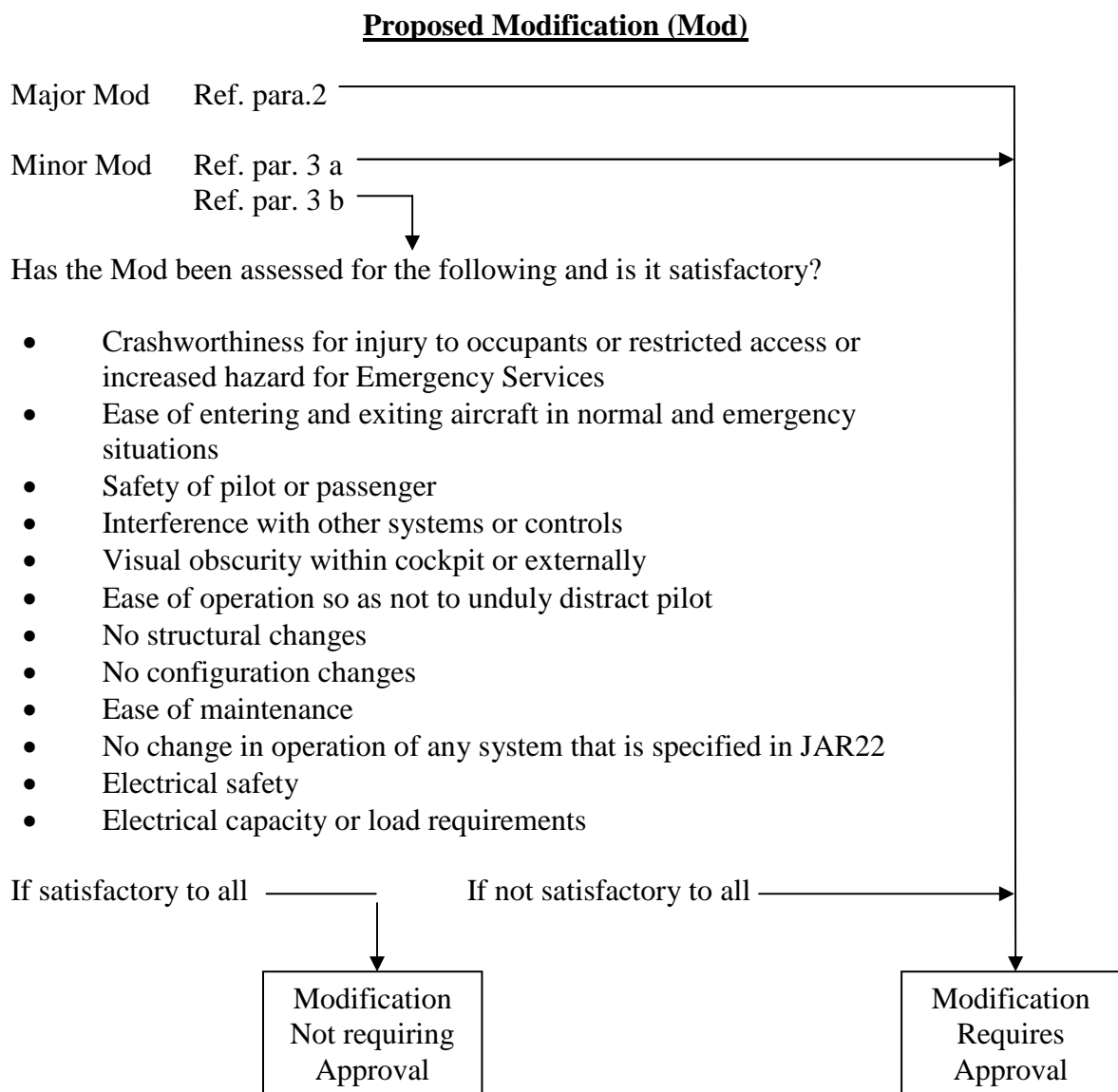
- 5 Application should be made preferably using BGA forms BGA 261 for a minor modification and BGA 282 for a major modification. Minor modifications may be applied for after completion, however, it advised that at least a verbal confirmation be obtained from the CTO prior to incorporation to ascertain acceptability.
A major modification should be applied for and approved prior to incorporation on a BGA aircraft.
- 6 Aircraft manufacturer (design authority) approved modifications would not normally require BGA approval provided that they did not alter the type certificate or designation of the aircraft.
- 7 The application form should be completed with as much detail as possible to enable the investigating engineer to assess the modification and make an accurate assessment without the need for constant referrals back to the applicant. Include sketches, drawings, wiring diagrams, manufacturers literature or specifications as appropriate.

APPROVAL

- 8 The CTO will normally approve minor modifications and where deemed necessary involve the technical committee if expert assistance is needed. A signed copy of the application form is used to communicate approval.
- 9 Major modifications are investigated and approved by the Technical Committee. Approval is communicated either by letter or by returning a signed copy of the application form.
- 10 Depending on the nature of the modification, if acceptable to the BGA, full approval will be given or in certain cases a permit to test may be granted. Again, depending on the complexity this could be a simple note or e-mail or may involve a Technical Committee test programme or requirements.

MODIFICATIONS NOT REQUIRING APPROVAL – CRITERIA TO BE MET

- 11 To check that a proposed modification meets the criteria for ‘not requiring approval’ please follow the flow chart below. If in doubt please apply for the modification to be approved, at the very least someone independent will then have the opportunity to review the proposed modification and advise if approval is required or not.



BGA AIRWORTHINESS AND MAINTENANCE PROCEDURES

PART 3, LEAFLET 3-4

DESIGN AND CERTIFICATION PROCEDURES FOR HOMEBUILT SAILPLANES

INTRODUCTION

1. **General.** This leaflet sets out guidelines for the recommended procedures by which a person or group should set about the design and construction of a homebuilt glider with a view to achieving certification by the BGA. The CAA approval of the BGA as an organisation responsible for all airworthiness aspects of sailplane operation in the UK is of particular value to the home designer/builder, since it enables the designer to communicate directly with experts in the gliding field with the minimum of formality. Consequently the BGA must be assured that the sailplane, particularly if it is home designed, meets the required standard of preparation and is safe for flight under the variety of conditions which it will meet. Only when this has been achieved will the aircraft be permitted to fly from BGA sites. The insurance companies are also conscious of the need for adequate certification and will generally only consider sailplanes cleared and certified by the BGA.
2. **Control and Inspection.** All technical matters related to the design, construction, certification and operation of sailplanes in the UK are the responsibility of the BGA Technical Committee. Matters requiring investigation outside the committee are progressed by the BGA's Chief Technical Officer (CTO). The BGA CTO also manages the approval of BGA maintenance inspectors and it is through one of these inspectors that the first contact with the BGA is likely to be made. Whilst the design experience of an inspector may not be great, he will be able to give a practical insight into what is required in the repair and construction of sailplanes and an idea of the problems likely to be met. Early contact with BGA inspector is strongly advised. If difficulties arise in finding such a person (most gliding clubs have a number within their membership), the Technical Committee can usually suggest the name of a suitable individual.

SAILPLANE DESIGN

3. **Design Approach.** A sailplane is an attractive proposition to a home designer because it is a simplified form of an aeroplane and is, in general, a less complex design task. Nonetheless, the design of a successful sailplane is a specialised art requiring particular care and attention in certain areas not necessarily common to those of normal aircraft design. Sailplane design has progressed apace over the past fifteen years and the modern high performance sailplane has become more and more advanced. The prospective home designer should be careful to take a realistic view of his/her ambitions (especially in regard to the likely achieved performance of his craft), with due regard to the resources and facilities available.
4. **Design Requirements.** Whilst the overall configuration and performance of the sailplane may be varied over wide limits to suit its envisaged role, the handling and strength requirements have been firmly set. The issue of a Certificate of Airworthiness is conditional on the design, construction and flight characteristics satisfying an approved set of sailplane design requirements. The BGA currently accepts gliders designed to the following requirements.
 - a. Joint Aviation Requirement (JAR) - Part 22.
 - b. OSTIV Airworthiness Requirements for Sailplanes 1998.

c. British Civil Airworthiness Requirements (BCAR) Section E - for vintage gliders and sailplanes only.

5. **Compliance With Requirements.** Compliance with these requirements will ensure that the sailplane is capable of safe operation in the wide variety of flight conditions to which a modern sailplane may be subjected whilst retaining every opportunity of producing an effective design solution in respect of both performance and economy. The BGA Technical Committee may be prepared to grant a CofA in cases where the aircraft does not entirely fulfil these requirements, provided that evidence of any deviation is forwarded to the Committee for its consideration in the particular case. Provided that the Committee is satisfied that safety is not jeopardised it may issue a concession against the particular requirements.

6. **Role of The Technical Committee.** It is strongly recommended that the BGA Technical Committee be contacted at an early stage of the proposed design, certainly before any significant expenditure is incurred. Generally speaking, the junction at which basic research has been completed and a provisional configuration has been established is a convenient waypoint. At this early stage the Technical Committee will probably suggest contact with one of its members as a design monitor who will keep the Committee informed of progress and attempt to provide assistance and information should it be required. The monitor's presence should in no way act as a constraint, the initiative being left firmly with the designer.

TYPE RECORD AND DESIGN SURVEY

7. On completion of design work, the Technical Committee will require the submission of sufficient evidence to establish the compliance of the sailplane with the relevant Design Requirements. Whilst there is no objection to the submission of all design calculations to the Committee, this is by no means necessary provided the required information is set out in a shorter form in the TYPE RECORD. This document should be prepared by the applicant for the Design Survey of the proposed sailplane. At a minimum it should contain:

- (a) A three-view General Arrangement drawing, a list of component drawings and a statement of the aircraft geometry sufficient to define the configuration of the aircraft for subsequent calculations.
- (b) A summary of design assumptions. This is a statement of the leading dimensions and principal aerodynamic and weight data upon which the design calculations are based, including such design criteria and assumptions used during the design calculations. This should include:
 - (i) The design envelopes, (manoeuvring and gust) of the sailplane with particular reference to operational and limit speeds.
 - (ii) The weight distribution assumed in the strength calculations, including moments of inertia and centre of gravity positions.
 - (iii) Aerodynamic calculation required for item (c) including:
 - Spanwise lift distribution.
 - Lift and drag estimates.
 - Pitching moments of wing and fuselage.
 - Downwash at tail.

Basic longitudinal and lateral characteristics.

(c) Strength and stiffness summary. This is a statement of design loads, critical cases, reserve factors and stiffness achieved, for all primary structure, including reference to design criteria and assumptions on which calculations have been made.

(d) The approach to be adopted to determine resistance to flutter within the desired flight envelope. This may be done by resonance testing and calculation, and/or by a carefully orchestrated test programme.

8. The design surveyor will normally be a member of the BGA Technical Committee, appointed by the Chairman. Following an initial examination of the Type Record and supporting evidence the surveyor will almost certainly wish to discuss various aspects of the design with the designer and where necessary may require further checks or, in the case of novel construction features, practical tests to be carried out before full approval is given to the design. Whilst it is quite likely that the construction of the aircraft will have started before the design is fully surveyed and cleared, it should be noted that changes may be required following the design check and thus it is as well not to proceed too far ahead with construction work without reference to the design monitor. He will be able to give some idea of the degree of confidence with which early construction of various components may be approached in order to facilitate parallel design and construction. The design survey can be arranged to be carried out in several stages. Following completion of the design survey, formal BGA Technical Committee involvement is complete until the Engineering Assessment is required.

CONSTRUCTION, INSPECTION, TEST AND CERTIFICATION

9. The procedures to be adopted for the construction, inspection, test and certification of homebuilt or kit-built sailplanes are described below.

10. **Plans and Kits**. When investigating plans or kits from other sources it is important to ascertain the design standard to which the aircraft is built. Most foreign design requirements are acceptable to the BGA but there may be exceptions. Should the choice be a foreign design not previously flown in this country there will naturally be some extra investigation to be carried out; probably extra flight trials and a minor design survey. As with amateur designer's sailplanes, it is worthwhile making contact with the inspecting authority at an early stage. In the case of recognised designs it is only necessary to make contact with an inspector (or senior inspector) but in cases of difficulty, or if a new and unrecognised design is being built, the BGA Technical Committee should be contacted.

11. **Materials**. In order to comply with design requirements the sailplane structure must be built from approved materials. All sailplane repair stations stock a variety of approved materials (wood, metal, GRP, etc) and Aircraft General Standard (AGS) parts. Those parts not available from repair stations can be obtained direct from factory or manufacturer, although some manufacturers are reluctant to supply small quantities. Only where special action has been taken is it permissible to use non-approved parts in primary and secondary structure since these materials require a larger reserve factor to cater for greater variation in quality. In special cases consult an inspector for further advice.

12. **Overview of Materials**. In making the choice of a particular sailplane construction, the facilities and circumstances of the builder's workshop must be considered. The specialised conditions of temperature and humidity required for work in Glass Fibre Reinforced Plastics (GRP) structure has rendered it unpopular with home builders. The specialised tooling required for metal structures has also discouraged homebuilders in metal although this is becoming less of a restraint. Anyone with a background or skill in metalwork may be justifiably attracted to this medium. Nevertheless by far the most attractive material for general homebuilt construction is wood (aircraft

Spruce or Pine); it is a forgiving medium and can be worked with the minimum of tools. Though requiring some skill in working, wood can be relied on to produce a workmanlike finished article.

13. **Workmanship.** During construction it is vital that absolute integrity of workmanship is observed. Any job which does not, when completed, hold the builder's full confidence with respect to finish standard or strength should be stripped out and redone. If doubt exists on any point a second opinion should be obtained; an inspector will undoubtedly look sympathetically on any such request for guidance. Only in this way will full confidence in the structural integrity of the machine be retained.

14. **Inspection.** The inspector should be consulted on any problems which arise during practical construction. He will be able to give or obtain advice on such matters. It is important that a working relationship is established with him such that a mutual confidence is achieved. He will be sympathetic to the builder's problems provided that the builder is open with him and willing to learn from his previous experience. The inspector will require notification, in advance, of such stages as completing the wing torsion box, completing control circuits, painting etc., so that he can carry out a final inspection before the evidence is enclosed. The inspector will, however, give his own guidance on the frequency of such visits as he will require.

15. **Final Inspection and Pre-flight Tests.** When construction is approaching completion the inspector will advise on the degree of inspection cover he will require before flight:

a. **Recognised Designs.** In these cases the degree of inspection and the amount of pre-flight testing will vary depending on the recommendations of the designer or kit manufacturer. Well established designs may require only a local inspector and the recommended pre-flight tests. These will certainly include weighing and a check of CofG calculations and control circuit stiffness checks. Proof load testing of structures is rarely required for sailplane designs but it is not unknown for some foreign designs to call for this. In such cases reference to the Technical Committee may be required to clarify such requirements.

b. **Amateur Designs.** In these cases the Technical Committee will require to carry out an "engineering assessment". This is an appraisal of the glider carried out by a member of the Technical Committee in conjunction with the designer at a suitable stage of construction at or near completion. The appraisal embraces all engineering aspects of the glider not covered by the design survey and is intended to ensure, as far as possible, that the glider can be operated satisfactorily and can be maintained in an airworthy condition without undue difficulty, by the operators for whom it is intended.

c. **Pre-Flight Tests.** The degree of pre-flight tests will be required as defined in the relevant airworthiness requirements. Those normally required for a new design are as follows:

1. Weight and CofG determination.
2. Control Circuit stiffness tests.
3. Longitudinal control circuit calibration.
4. Wing Torsional stiffness test.
5. Tow rope release test.
6. Brake parachute release test (when applicable).

All of these tests are quite easily organised using the minimum of equipment and basic measuring tools. The engineering assessor may wish to be present at some or all of these tests and since he will have previous experience of these exercises, will probably be able to render valuable assistance on methods and techniques.

16. **Flight Tests.** The extent of the interest that the Technical Committee will need to take in the flight testing of a new sailplane will depend on the previous experience gained with the type. Following the final inspection (or engineering assessment if applicable) the inspector responsible will liaise with the Technical Committee (through the CTO) who will decide on the degree of flight trials required. When this has been decided, the CTO will issue a permit to Test Fly, probably only valid for three months, setting out the limitations to range, flight envelope and operational limits. A typical programme is as follows:-

- (a) General Handling.
- (b) Operational Limitations (cross wind takeoff and landing limits, max. tow speeds, etc).
- (c) Airspeed calibration (if not previously carried out).
- (d) Quantitative Longitudinal stability analysis and determination of CofG range.
- (e) Behaviour at high speed.
- (f) Behaviour at low speed, stalling and spinning (as required).
- (g) Flutter testing, if not proven by calculation.

As a rule about twelve to sixteen flights will probably be required for the full flight test programme. The test pilot will prepare a detailed written report on all aspects of the sailplane's behaviour and in conclusion any recommended modifications to be embodied before C of A award. This, together with the Design Survey and Engineering assessment, will form the basis of final C of A application.

CERTIFICATION PROCEDURE

17. Following completion of the flight test report, this and all other supporting information (eg type record, report on ground test, Design Surveyor's report etc) should be submitted to the BGA Technical Committee with a formal request for the granting of a CofA. Provided that good liaison has been maintained with the inspector, CTO and Technical Committee this should be a formality required only as an assurance that any modifications required have been carried out. Two categories of certification are available. Should there be uncertainty as to the classification of a particular project, a discussion with the CTO should define the most suitable category.

18. **Permit to Fly.** This category can be considered as very limited approval to continue operation in cases where paperwork is incomplete or while some undesirable feature is still in the process of being removed. Appropriate flight limitations and operational restrictions will be observed during this period and naming the pilots cleared to carry out the testing. Broadly, the requirements can vary between the two examples given below.

- (a) Well established and tried designs (ie those which have previously achieved type certification). In this case the glider may be flown by a nominated individual(s), eg Club CFI, experienced local pilot or the constructors themselves. The experience of the proposed pilots should be included in the 'Permit To Test Fly' application. General handling tests only will be required including low and high speed flight, stalling and such manoeuvres as the machine has previously been cleared to carry out. A short report should be attached to the

CofA application on completion of the trials. As a general rule about four to six flights will probably be needed to cover this sort of clearance.

(b) Completely new design. In cases of entirely new sailplanes the engineering assessment will probably have been carried out by the CTO or member of the Technical Committee. The details of the flight test programme will then be defined by the Technical Committee. A permit to fly will then be issued detailing the limitations on operation including type(s) of launch, pilots, flight limitations and purposes of operation. All pilots must be approved by the BGA. The designer/builder(s) will be added to the list of pilots on the permit provided their experience is considered sufficient. In that case the owners will generally be permitted to carry out their own development flying; mutually agreed pilot(s) will carry out the initial development flying.

(c) When flight development has reached an acceptable conclusion the flight tests acceptance trials for a CofA will be carried out by a BGA Test Group. These groups are situated at various gliding sites around the country and the constructor may choose whichever is most convenient to him. In cases of difficulty a new local test pilot may be appointed by the Technical Committee for a particular task.

(d) The test pilot will carry out trials in accordance with the relevant design requirements. These flight tests will cover all regimes of flight for which certification is to be sought including clearance of the CofG to be included on the permit which must be renewed, generally, every three months. While a sailplane can, in theory, exist in this manner indefinitely, the requirement for regular inspection and permit renewal will become inconvenient to both BGA and owner and applicants are to be encouraged to progress to a more permanent certification category.

20. **Full Certificate of Airworthiness.** This is the category that is held by the vast majority of production sailplanes flying in the UK. It is subject to annual renewal pending the normal annual inspection. Successful home designed sailplanes can qualify for this certification standard when they have successfully completed the formal procedures laid down above and have demonstrated their airworthiness and maintainability over a period on a permit or an experimental CofA. Prospective kit builders should check that their kit possesses, or is likely to achieve, this airworthiness standard.

BGA AIRWORTHINESS AND MAINTENANCE PROCEDURES

PART 3, LEAFLET 3-5

MAINTENANCE CERTIFICATION

INTRODUCTION

1. Any work carried out on Sailplanes or Self Sustainer Sailplanes maintained under the BGA Maintenance approval is to be properly recorded and certified on worksheets or in the aircraft log book. This leaflet gives guidance to BGA Clubs, Private owners and BGA Inspectors on how any maintenance is certified.

MAINTENANCE CERTIFICATION

2. **Maintenance work.** With the exception of the Daily Inspection (DI), all maintenance work carried out on sailplanes maintained under the BGA approval scheme is to be certified by an appropriately rated BGA Inspector.

The BGA 267 series should be used for certification of annual maintenance and minor rectification accomplished at that time.

Rectification worksheets should be used to record all other rectification unless it is entered directly in the aircraft logbook.

3. **Daily Inspection.** The DI may be certified by the aircraft owner, a pilot or approved person appointed by the Gliding Club or by a BGA inspector.

4. **Duplicate Inspections.** Duplicate inspections may be completed by persons other than BGA inspectors, details to be found in Part 2 of the BGA Airworthiness Exposition.

USE OF RECTIFICATION WORKSHEETS

5. It is strongly recommended that rectification worksheets be used to record all work carried out on aircraft, especially during extensive repairs or refurbishment's. Such action will keep track of the progress of work and the rectification action which has been carried out. This will avoid the possibility of unrecorded work being carried out or a failure to return to an airworthy condition any fault or any structure or system which has been disturbed.

Further guidance on the use of rectification worksheets is contained in Part 4, Leaflet 4-2 of this manual.

GLIDER LOG BOOKS

6. Examples of how to complete BGA Glider log books will be found in annex 1 and 2

RECORD OF MANDATORY MODIFICATIONS/INSPECTIONS

Component	Modification Ref.	Description	Certified	
			Inspector	Date
<i>Canopy</i>	<i>AD86-136, TN359-9</i>	<i>Canopy jettison, lever to be red</i>	<i>F Smith I/C/999</i>	<i>7/8/86</i>
<i>Aileron</i>	<i>AD87-1, TN359-11</i>	<i>Mass balance increased</i>	<i>F Smith I/C/999</i>	<i>10/5/87</i>
<i>Flight manual</i>	<i>TN359-13</i>	<i>Revision</i>	<i>J Jones I/A/888</i>	<i>5/5/88</i>
<i>Wing</i>	<i>AD89-22, TN359-4</i>	<i>Wing root mod</i>	<i>F Smith I/C/999</i>	<i>18/6/89</i>
<i>Air brakes</i>	<i>TNS</i>	<i>Introduce drain holes</i>	<i>F Smith I/C/999</i>	<i>5/2/92</i>
<i>Water ingress</i>	<i>BGA 009/10/2000 iss1</i>	<i>Inspection</i>	<i>A Other I/C/777</i>	<i>4/11/00</i>

TOTAL
Brought forward 345.30

.....2002.....Year

DATE	Flying H	Time M	Launches	D.I.	REPAIRS, ADJUSTMENTS, COMMENTS ETC	Passed out as Airworthy By – And date
<i>B/Fwd</i>	<i>345</i>	<i>30</i>	<i>1007</i>			
<i>Jan 2002</i>	<i>6</i>	<i>00</i>	<i>9</i>			
<i>Feb 2002</i>	<i>8</i>	<i>30</i>	<i>5</i>			
<i>March 2002</i>	<i>2</i>	<i>00</i>	<i>6</i>			
<i>April 2002</i>	<i>15</i>	<i>30</i>	<i>5</i>			
<i>May 2002</i>	<i>0</i>	<i>00</i>	<i>0</i>		<i>C of A completed, brake pads replaced, L/H Aileron rose joint replaced</i>	<i>A Other I/C/777</i>
<i>June 2002</i>	<i>25</i>	<i>15</i>	<i>10</i>		<i>Hard wax applied, Glider reweighed</i>	<i>15/5/02</i>
<i>July 2002</i>	<i>14</i>	<i>40</i>	<i>9</i>			
<i>August 2002</i>	<i>42</i>	<i>10</i>	<i>30</i>		<i>Heavy landing inspection – No damage</i>	<i>F Smith I/C/999</i>
<i>Sept 2002</i>	<i>10</i>	<i>40</i>	<i>11</i>			<i>20/8/02</i>
<i>Oct 2002</i>	<i>1</i>	<i>20</i>	<i>3</i>			
<i>Nov 2002</i>	<i>0</i>	<i>10</i>	<i>1</i>		<i>Main wheel tyre & tube replaced</i>	<i>A Other I/C/777</i>
<i>Dec 2002</i>	<i>1</i>	<i>15</i>	<i>3</i>			<i>5/11/02</i>
<i>TOTAL Carried forward</i>	<i>473</i>	<i>00</i>	<i>1099</i>			

BGA AIRWORTHINESS AND MAINTENANCE PROCEDURES

PART 3, LEAFLET 3-6

RETURN TO SERVICE OF AIRCRAFT PARTS RECOVERED FROM GLIDERS INVOLVED IN ACCIDENTS OR INCIDENTS

INTRODUCTION

The CAA's requirements for the return to service of aircraft parts recovered from aircraft involved in accidents or incidents are clearly expressed in Airworthiness Notice 97, which is to be complied with in the case of aircraft issued with a CAA C of A.

Such guidance is well found and should form the basis of how parts and equipment of gliders should be handled before they are reused. After involvement in an accident or incident, glider parts or equipment may have been rendered unserviceable having been over stressed during the event. It is not always possible to ascertain the condition of a component by visual examination and this leaflet outlines the requirements which are to be applied to components before reuse on aircraft with a BGA C of A.

REQUIREMENTS

Before any glider parts are reused after being involved in an accident or incident, the full circumstances of the accident or incident are to be reviewed to establish if it is possible that any parts may have been taken above their proof load. Visual examination or overhaul may not establish if a component has been overloaded and items of significant structural significance must not be reused if there is any doubt whatsoever that they may have been over stressed; e.g. wing attachment fittings or engine bearers. Moreover, items involved in a fire should also be checked to ensure that damage has not occurred, including the loss of strength in materials caused by the effects of heat.

Where possible, the advice of the aircraft manufacturer should be sought. Before salvaged components are reused their history and source should be investigated and fully documented in the aircraft records.

If it is not possible to determine the history of condition of the component it should not be reused and should be destroyed or rendered unusable.

INSPECTION GUIDANCE

The use of non-destructive testing methods should be used to assist in establishing the serviceability of components. X-rays, Ultrasonic, Eddy-Current, Magnetic particle inspection, and Dye-Penetrant are some of the methods used. Each has its own limitations and uses. For expert advice consult with a qualified CAA Approved NDT engineer.

BGA AIRWORTHINESS AND MAINTENANCE PROCEDURES

PART 3, LEAFLET 3-7

REGISTRATION PROCEDURE FOR SAILPLANES AND SELF SUSTAINING SAILPLANES

Updated for the transition from BGA C of A to EASA C of A

1 INTRODUCTION

- 1.1 With the introduction of EU regulation 1592/2002 it became a requirement for sailplanes to be registered with a National Aviation Authority and be issued with an EASA Airworthiness Certificate (C of A). However, sailplanes under the control of the BGA have been temporarily exempted from this requirement by the Department for Transport (DfT).
- 1.2 This temporary DfT exemption expires on 28 September 2008. From this date, all UK based sailplanes (other than those which have a permanent exemption under Annex II of EU regulation 1592/2002) will need to be registered with the CAA and be issued with an EASA C of A. These sailplanes which must be registered are referred to in the rest of this document as 'EASA sailplanes.'
- 1.3 This leaflet details the procedure to be followed for the first step in moving away from the temporary exemption: to obtain CAA registration.

It should be noted that the procedure detailed below is not applicable to tugs, self launching sailplanes and motor gliders, sailplanes exempted from EU regulation 1592-2002 (Annex II) and sailplanes not using the BGA as the approval organisation or where the owner is not a member of a BGA club. The term 'sailplane' includes self-sustaining sailplanes (turbos).

1.4 **Affected aircraft**

- EASA sailplanes operating in the UK

1.5 **Non-affected aircraft**

- Non-EASA sailplanes (including those listed in Annex II)
- EASA sailplanes based outside the EU
- In general, EASA sailplanes operating outside the UK but within the EU. (EASA sailplanes operating outside the UK but within the EU may be considered on a case by case basis).

Note: the BGA will continue to register:

- i) BGA approved types of Annex II sailplanes operating within the UK; and
- ii) Annex II British vintage sailplanes operating within the EU.

These aircraft do not require a CAA registration. See the EASA web site for Annex II list.

1.6 **Timing**

a) **EASA sailplanes first imported into the UK after 28 September 2007***

All such sailplanes will require immediate registration with the CAA before an EASA C of A can be issued. The BGA will not issue BGA C's of A to EASA sailplanes from 1st October 2007).

b) **EASA sailplanes registered with the BGA prior to 28 September 2007 that are subject to transition to an EASA C of A****

All such sailplanes will require registration with the CAA before an EASA C of A can be issued. EASA Cs of A must be issued for all such sailplanes by 28 September 2008.

*This includes EASA sailplanes where the initial application for a BGA C of A will not be completed before 1st October 2007.

**Sailplanes under the BGA airworthiness system (C of A) but flying outside the UK are treated as if they were flying in the UK. Some persons outside the UK may not be eligible to register an aircraft with the CAA. In those cases, you should contact your National Aviation Authority.

Please note:

Once a CAA registration mark has been issued it must be displayed on the aircraft and the registration completed before the aircraft's next flight.

2 CAA REGISTRATION

2.1 **Application**

Application for CAA registration is made on CAA form CA1. This is available to download from the CAA web site (www.caa.co.uk) or can be obtained from the following address.

Civil Aviation Authority
Aircraft Registration Section
CAA House
45-59 Kingsway
London
WC2B 6TE.

Tel 020 7453 6666, Fax 020 7453 6670

The following supporting documentation must be sent with the application:

- EU 785/2004 compliant insurance certificate.
- CAA registration fee

In addition, when registering a new aircraft, a certificate of non-registration must accompany the application. When registering a used aircraft on its first import into the UK, a certificate of de-registration must accompany the registration.

2.2 Completing the CA1

General advice on completing the CA1 is provided along with the form. Following this, together with the glider-specific advice below, should help your application to be trouble-free.

- 1b – Enter ‘Glider’
- 1c – This should be completed if the glider is self-sustaining
- 1d – Enter ‘Piston’ or ‘Wankel’ as and if appropriate
- 1e – Enter the glider’s maximum all up weight as defined by the manufacturer in kg, including water ballast
- 1f – Enter ‘Nil’ if single seater; ‘1’ if two seater
- 1g – Enter ‘No’
- 4b – Normally the CAA will advise the registration mark (but see below)
- 5 – Enter the BGA Tri-graph in addition to any previous marks
- 6 – If the glider is owned by a co-ownership syndicate then the owners' details should be entered in 6a with the group name in 6b.
- In cases where there are three or more individual owners of an aircraft it is recommended that one of the owners, or at the most two, are nominated as trustees of the syndicate. The details of the other shareholders need to be given on a CAA registration department-supplied ‘trustee grid’ form. In this way any member may leave or join the group without the need to re-register the glider on every occasion and thus incurring a fee. Unfortunately, the glider must be re-registered if the trustee leaves the group.
- 9a – This must be completed. The month and year is sufficient.

2.3 Owners with Large Numbers of Sailplanes

For owners with large numbers of gliders (e.g. clubs) the CAA advise that they should be able to accept a single CA1 application containing all the constant information and a separate schedule of the variable elements, such as the glider type, date of ownership, etc. In these circumstances, you should contact the CAA registration department directly and they will devise a schedule format that is appropriate for your needs. The usual CAA fee will still apply on a per-glider basis.

2.4 Fees

The fees to register a sailplane with the CAA are published on the CAA web site. The current fees (as of 1st July 2007) are as follows:

Normal registration:	£60
Out of sequence registration	£160 in addition to the above fee
Change of owner	£60
Change of owner’s address	No fee

For group owned aircraft, the CAA does not charge a fee for amending ownership details unless the owner whose address has changed has been nominated as trustee.

Change of trustee ownership details must also be notified to the BGA to maintain accurate records and to ensure the owner continues to receive important airworthiness information. (The BGA do not charge for this process). The BGA is unable to advise the CAA of ownership changes.

2.5 Issue of CAA Registration Marks

If your sailplane does not already have one, you should firstly contact the BGA to reserve a BGA number and trigraph. There is no charge for allocation of a BGA number or trigraph.

The BGA number and trigraph should be used in all correspondence with the BGA as these will uniquely identify the sailplane in the BGA database. Once a BGA number and trigraph (three letter identification) has been issued, a CAA registration can be applied for.

By default, applicants will be allocated a CAA registration mark in the form 'G-CTTT', where TTT is the BGA trigraph. If this mark has already been allocated, the C will be replaced by another letter, usually D, to give a unique registration.

Please note that if your trigraph contains the letter Q then the CAA is unable to issue a trigraph-related registration as the letter Q cannot be issued as part of a G-XXXX registration. In these circumstances, you can proceed in one of two ways. If you wish, the CAA will provide you with a standard sequential registration mark. You will be allowed to choose from approximately 75 marks that are 'in sequence' at the time of application. To do this, you should enter 'please telephone' in the 'Proposed Mark' section of question 4 on the CAA registration application form CA1. The CAA will contact you upon receipt of the application form to allow you to make your choice.

Alternatively, if you would prefer to have a CAA registration that corresponds to your trigraph, the BGA will endeavour to change your trigraph by substituting 'O's for any 'Q's in your current trigraph - for example 'AYQ' would become 'AYO.' (It should be relatively easy to make this change to the glider's current physical markings). If you wish to take this option, you must arrange the trigraph change with the BGA office before applying for CAA registration.

Note that the above two options only apply if your current trigraph contains the letter Q.

Alternatively, applicants can specify an 'out-of-sequence' registration mark of their choice, akin to a personalised car number plate. This option carries an additional CAA charge of £160.

2.6 Further Guidance:

Further guidance on the registration process, current fees, forms and FAQs are available on the CAA web site. Go to www.srg.caa.co.uk and look under 'Aircraft Register'.

3 AIRCRAFT MARKINGS

3.1 CAA Markings

To comply with the Air Navigation Order, sailplanes must display the allocated nationality (G-) and registration marks in accordance with CAP 523 or be in possession of a valid exemption granted by the CAA. The registration marks must be displayed on both sides of the fuselage and the underside of the left (port) wing. CAP523 details the size, format and position of the marks and can be downloaded from the CAA web site.

Additional guidance is given in section 3.5 below.

3.2 **BGA Markings**

BGA Laws and Rules states that an EASA sailplane with an EASA C of A does not need to display a BGA number. However, EASA sailplane owners who have registered their sailplanes are reminded of the continuing requirement (BGA Operational Regulation 1.9) for BGA approved identification markings (the trigraph or competition number – see below) to be displayed as large as practicable on each side of the fin and/or rudder of the sailplane in a substantially vertical plane. There is no need to display ‘BGA approved identification markings’ under the wing. However, if BGA markings are displayed on the underside of the wing, they should be displayed under the right (starboard) wing.

3.3 **Competition Numbers**

Competition numbers are available from the BGA at a small additional charge. In the absence of a competition number, the trigraph (last 3 letters of the CAA registration) should be displayed on the fin.

3.4 **Identification Plate**

All sailplanes require a metal identification plate bearing the nationality and registration marks (G-xxxx). It is recommended that the BGA number is also engraved on this.

3.5 **Registration Markings – General Guidance**

Due to the physical, structural and aerodynamic limitations of the majority of modern sailplanes, the following guidance on the size, position, colour and type of registration marks is offered to assist in interpreting CAP 523 ‘The Display of Nationality and Registration Marks on Aircraft: Guidance for Owners’.

Fuselage:

The registration marks should be centred on the tail boom about midway between the trailing edge of the wing and the leading edge of the fin or tailplane.

The height of the letters should be approximately one quarter of the circumference of the tail boom at the midway point. (1m circumference fuselage would mean 250mm high letters).

Wing:

The registration marks should be centred about the mid section or the predominantly constant section of the underside of the left (port) wing. Marks can cross segmented wing sections but cannot cross optional and removable tip sections. Marks should not cross onto flaps and ailerons but may cross air brake caps.

Edge margins should be left at approx 150 mm from the leading edge (tops of letters) and 100mm from the trailing edge of the wing (not control surface).

If the wing has factory fitted turbulator tapes or is ‘blown’, advice should be sought from the manufacturer prior to applying registration marks in case there are any aerodynamic considerations to be aware of.

Size:

CAP 523 lays down the size, proportions and format of the letters taking into account the structural limitations above. Embellished fonts are not allowed.

Colour:

Letters should be in a contrasting colour to the background. However, on GRP aircraft, dark colours must be avoided due to heat degradation of some structures. Always follow the sailplane manufacturer's advice but, in the absence of any other guidelines, for white GRP aircraft, letters should be mid-grey, mid-blue or an equivalent contrasting colour.

Light colours will probably offer insufficient contrast and therefore will not normally be acceptable.

Application and thickness:

For most normal applications, stick-on vinyl letters will be perfectly adequate and be the most economical option.

It should be noted that vinyl does not adhere to some fabric covered surfaces particularly well and painting may be the best solution.

Remember to cut the letters at wing intersections or airbrake caps and clear any vents or drains. Letters should be positioned well clear of static instrument ports.

For some high performance applications the letters can be painted very thinly or even set into the gel coat. Both these applications are more labour intensive and therefore more costly.

Please remember:

If the size, position or colour of the registration marks is incorrect or not displayed to the best advantage the CAA could insist that they are redone.

Competition and fin markings:

These should be applied on the fin and if desired, on the underside of the right (starboard) wing in accordance with BGA Laws and Rules for Glider Pilots

You may not display the last 3 letters of an 'out of sequence' CAA registration mark (unless it is the same as the trigraph). If you want to display anything other than the trigraph, you will need to apply to the BGA for a competition number. This is transferable between sailplanes.

For aesthetic reasons the competition or fin markings should be in the same font and colour as the registration marks and, if space allows, may be larger. Embellished fonts should not be used as these can be difficult to read from a distance and, in any event, are not allowed for registration marks.

Fireproof identification plate.

The nationality and registration marks should be engraved on a small plate made from stainless steel or similar material. It is recommended that the letters should be approximately 10mm high in plain font.

The registration letters may be incorporated on the aircraft serial number plate using appropriately sized letters.

Supplies

Some glider spares suppliers and repairers have vinyl letter cutting machines and supplies of suitable vinyl for registration marks. They may also have equipment for engraving fireproof identification plates.

Trophy engravers can also supply fireproof identification plates using jewellers' silver plate. This would be an acceptable alternative to stainless steel.

Vinyl templates can also be used as masks for painting registration marks onto the aircraft.

3.6 Exemptions

Exemption from the need to display CAA registration markings are available in a limited number of cases, normally to enable aircraft to display historically accurate military liveries and marks. Details and application forms are available from the CAA web site.

Note that for aircraft to bear military markings, permission must be obtained from the Ministry of Defence or the appropriate foreign government.