

**BRITISH MICROLIGHT AIRCRAFT ASSOCIATION
TECHNICAL INFORMATION LEAFLET**

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GUIDE TO AIRWORTHINESS

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1. Introduction

Aircraft in the BMAA fleet differ from many other classes of aircraft in that it is primarily the owner/operator – *not* an inspector, maintenance organisation, or the BMAA – who is responsible for ensuring that they are maintained in an airworthy condition. This does not mean that the owner/operator has to do all the work himself, but that he is responsible for ensuring that the work is done satisfactorily.

Aircraft in the BMAA fleet operate on Permits to Fly issued by the UK Civil Aviation Authority (CAA). A Condition associated with these CAA Permits to Fly requires that “*the aircraft shall be maintained in an airworthy condition*”. If this is not done properly the Permit to Fly is invalidated. An example Permit to Fly and its Conditions are shown in figure 1.

This document is a brief guide to airworthiness for owner/operators.

<p align="center">UNITED KINGDOM CIVIL AVIATION AUTHORITY</p> <p align="center">PERMIT TO FLY AND NOISE CERTIFICATE</p>														
<p>Certificate No: PR-001</p>														
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<p>This Permit to Fly, issued pursuant to the United Kingdom Air Navigation Order, hereby permits this aircraft to fly within United Kingdom airspace only, without a Certificate of Airworthiness being in force in respect thereof. The aircraft to which this Permit applies is classified as a microlight aeroplane as defined in the Air Navigation Order and has been found to comply with appropriate design standards. This permission for flight within United Kingdom airspace does not constitute a Certificate of Airworthiness issued pursuant to the Convention on International Civil Aviation dated 7 December 1944.</p> <p>This Permit to Fly is issued subject to the associated Conditions.</p> <p>EXEMPTION</p> <p>The Civil Aviation Authority in exercise of its powers under the Air Navigation Order, hereby exempts this aircraft from the provisions of the said Order which prohibits an aircraft flying in accordance with the conditions of a Permit to Fly, from flying on any flight which does not begin and end in the United Kingdom without passing over any other country. This exemption is granted subject to the condition that before flying within any other country, permission is obtained from the appropriate authority of that country.</p> <p>A CERTIFICATE OF VALIDITY FORMS PART OF THIS PERMIT TO FLY</p> <p>The Certificate of Validity will be issued or renewed by an appropriately approved organisation, upon being satisfied with the design, construction and airworthiness of the aircraft. The Certificate of Validity will remain valid for the period prescribed from the date of issue.</p> <p>NOISE CERTIFICATE</p> <p>This Noise Certificate is issued pursuant to the Air Navigation (Environmental Standards) Order 2002 in respect of the subject aircraft, which at its date of issue is confirmed as being in compliance with the relevant noise standards.</p> <p>Date: 18 May 2011</p> <p align="center">for the Civil Aviation Authority</p>														
<p>No entries or endorsements may be made on this Permit or the Certificate of Validity except by an authorised person. If either document is lost the Civil Aviation Authority should be informed at once. Any person finding these documents should forward them immediately to the Civil Aviation Authority, Safety Regulation Group, Aviation House, South Area, Gatwick Airport, West Sussex, RH6 0YP.</p> <p>BMAA Type Approved Microlight PTF - 08082008</p>														

<p align="center">UNITED KINGDOM CIVIL AVIATION AUTHORITY</p> <p align="center">CONDITIONS OF PERMIT TO FLY NO PR-001</p>														
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<p>Where relevant, the Conditions associated with this Permit supersede those specified in the manufacturers' operating limitations.</p> <ol style="list-style-type: none"> The aircraft shall be maintained in an airworthy condition. The aircraft shall be operated in accordance with the current procedures and limitations contained in the applicable technical publications and with the manufacturers' instructions for the type and model of aircraft. The aircraft is permitted to fly only for non-aerobatic operation. Non-aerobatic operation includes: <ul style="list-style-type: none"> (i) any manoeuvre necessary for normal flying. (ii) intentional stalls from level flight. (iii) steep turns in which the angle of bank does not exceed 60 degrees. Smoking in the aircraft is prohibited. This aircraft is hereby granted a permission to fly for the purposes of aerial work which consists of the giving of instruction in flying or the conducting of flying tests subject to the aeroplane being owned or operated under arrangements entered into by a flying club of which the person giving the instruction or conducting the test and the person receiving the instruction or undergoing the test are both members. <p align="center">for the Civil Aviation Authority</p>														
<p>No entries or endorsements may be made on this document except by an authorised person.</p> <p>BMAA Type Approved Microlight PTF - 02092008</p>														

**Figure 1: A Permit to Fly for a type-approved (factory-built) microlight.
On the left is the combined Permit to Fly and Noise Certificate¹; on the right are the Conditions of the Permit.
A Permit to Fly is not valid without a valid Certificate of Validity: see figure 2.**

¹ Amateur-built aircraft, and aircraft that have a powerplant approved by BMAA MAAN, require a separate Noise Certificate.

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1.1. Airworthiness of Permit to Fly aircraft

Owner/operators should be aware of a fundamental difference between Permit to Fly aircraft, and Certificate of Airworthiness aircraft. The approval process for Permit to Fly aircraft concentrates on assuring that the aircraft is fundamentally safe *when in good condition*. The comprehensive safe-life, and/or damage-tolerance, investigations that are generally required for Certificate of Airworthiness aircraft are not required. Therefore regular and thorough inspection, and conscientious maintenance are key parts of safely operating a Permit to Fly aircraft.

1.2. Engines

CAA CAP 747 GC No. 7 states that the *“the composition and properties of some Mogas fuels has changed and it is becoming increasingly difficult to obtain Mogas that does not contain any alcohol. With the exception of microlights, the use of Mogas containing alcohol is generally prohibited in aircraft”*. Additionally the BMAA fleet is not required to use certified engines. Therefore, unless the Aircraft Maintenance Manual states otherwise, the BMAA considers that if the engine manufacturer’s required maintenance is not followed, this does not invalidate the Permit to Fly. However if the engine manufacturer’s advice is not followed, the user must fully accept that there may be an increased risk of engine failure.

1.3. Inspection for Permit to Fly revalidation

Owner/operators should note that the inspection by a BMAA Inspector for revalidation of the Permit to Fly:

- Is not a complete inspection; only parts that are readily accessible are inspected.
- Reflects the condition of the aircraft on the day of inspection, but does not guarantee that the aircraft will remain airworthy for the whole year (see section 1.1)

2. Maintenance Manual

The key tool for maintaining an aircraft in an airworthy condition is the aircraft’s Maintenance Manual. For simple aircraft the Maintenance Manual is often amalgamated with the Flight Manual in the Aircraft Manual.

The Maintenance Manual describes the Checks required to maintain the aircraft in an airworthy condition. The Checks generally combine inspection and maintenance actions.

2.1. Scheduled Checks

Scheduled Checks will normally range from the pre-flight inspection to major overhauls.

Checks are composed of lists of actions that include:

- Pure inspection actions.
- Inspection actions that require the aircraft to be (at least partially) disassembled to satisfactorily inspect components.
- Pure maintenance actions such as lubrication or cleaning.
- Replacement of ‘lifer’ items, which must be replaced, irrespective of their visual condition, with new after a specified interval.

Components that are no longer serviceable must be replaced in accordance with the BMAA’s replacement parts policy, which is described in TIL 058². If replacement involves a manufacturing process – as opposed to simply bolting on a replacement – repair approval may be required (see section 6.4).

2.2. Required actions

A Condition associated with the CAA Permit to Fly requires that *“the aircraft shall be operated in accordance [...] with the manufacturers’ instructions for the type and model of aircraft”*. Therefore mandated actions required by the aircraft’s maintenance manual – as opposed to optional or advisory actions – must be performed or the Permit to Fly is invalidated.

3. Second Inspections and Qualified Persons

Safety-critical maintenance tasks – where a mistake could create a significant hazard – require a Second Inspection by a Qualified Person. These requirements are described in TIL 065³.

² BMAA Technical Information Leaflet 058 – Replacement Parts

³ BMAA Technical Information Leaflet 065 – Second Inspections and Qualified Persons

4. Service Bulletins and Mandatory Permit Directives

4.1. Service Bulletins (SBs)

Service Bulletins (commonly contracted to SB) are normally issued following in-service experience of a type to remedy a defect in the type's design/construction. Service Bulletins are normally issued by the body responsible for the type's continued airworthiness (see section 5). Service Bulletins normally describe a special inspection and/or modification to be performed and may require the involvement of a BMAA Inspector.

However strongly incorporation of a Service Bulletin may be advised, incorporation is not legally mandatory unless it is mandated by a Mandatory Permit Directive (see section 4.2).

4.2. Mandatory Permit Directives (MPDs)

Mandatory Permit Directives (commonly contracted to MPD) are issued by the CAA⁴. CAP 661: Mandatory Permit Directives; contained all issued MPDs up until 31 January 2012, when the publication ceased to be amended. The MPDs in CAP 661 remain valid and are not 'withdrawn'. All MPDs realised after 31st January 2012 are available directly on the CAA website:

<http://publicapps.caa.co.uk/modalapplication.aspx?appid=11&mode=list&type=sercat&id=55>

Although they can be issued in isolation, they are normally used to mandate incorporation of a Service Bulletin. An aircraft's Permit to Fly is invalid while the terms of a Mandatory Permit Directive are not complied with.

5. Bodies responsible for continued airworthiness

Continued airworthiness activities include collecting and analysing accident, incident and defect reports from owners/operators so that appropriate action can be taken if these reports highlight a defect in the design/construction of the type (or other recurring problem).

For each type in the BMAA fleet, there is a 'body' responsible for the type's continued airworthiness. This body is either the manufacturer or the BMAA.

5.1. Supported, type-approved (factory-built) types

For supported (not orphan), factory-built types the type-approval holder (CAA approved manufacturer) is responsible for continued airworthiness. Therefore defects should be reported to the type-approval holder. Service Bulletins for these types are issued by the type-approval holder.

Note: contrary to popular belief, aside from revalidating the Permit to Fly, the BMAA is not formally responsible for the continued airworthiness of a supported, type-approved aircraft. The BMAA is happy to receive reports on type-approved aircraft so that we can advise the type-approval holder. If appropriate we will also inform the BMAA Inspectorate.

5.2. Amateur-built types

The BMAA is formally responsible for the continued airworthiness of amateur-built types. However in practice it shares its responsibility with the UK distributor (whether that be the kit importer or designer/manufacturer). Therefore we request that defects with these aircraft are reported to the UK distributor, copying the BMAA for our information. Service Bulletins for these types are issued by the BMAA.

5.3. Orphan types

Orphan types are those where the manufacturer no longer exists. The BMAA assumes responsibility for the continued airworthiness of orphan types. Therefore all defects with these aircraft should be reported to the BMAA.

6. Activities requiring BMAA involvement

6.1. Permit to Fly revalidation

To be valid, a Permit to Fly requires a Certificate of Validity. A Certificate of Validity is valid for up to 12 months. An example Certificate of Validity is shown in figure 2.

⁴ All MPDs are available on the CAA website. All but the latest MPDs are archived in CAP 661. Search www.caa.co.uk for "MPD" and "CAP 661".

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Certificates of Validity are issued by the BMAA on application from the owner, following a satisfactory inspection (by a BMAA Inspector) and check flight. The process is described in TIL 066⁵.

The inspection includes a review of the aircraft's paperwork as well as an inspection of the airframe. One of the paperwork checks is to confirm that all required maintenance actions have been performed (see section 2.2).



Figure 2: a Certificate of Validity for the Permit to Fly in figure 1.

6.2. Amateur-built aircraft construction

To qualify for a Permit to Fly, BMAA amateur-built aircraft types must be constructed under the supervision of the BMAA. In particular, construction is inspected at key stages by a BMAA Inspector. The process is described in TIL 039⁶.

6.3. Aircraft weighing

Weighings must be performed (or witnessed) by a BMAA Inspector. See TIL 012⁷. Embodiment of modifications, repairs and certain maintenance activities (such as engine replacement) may also require a reweighing. Contact the BMAA Technical Office for guidance.

6.4. Modifications and repairs to aircraft

A Permit to Fly is issued, and revalidated, subject to both the design and construction of the aircraft being approved. Therefore, apart from certain exceptions, all modifications and repairs to BMAA aircraft require approval.

The process of applying to the BMAA for approval is described in TIL 002⁸.

TIL 001⁹ describes which repairs require explicit approval, and which do not, and the process of applying to the BMAA for approval. Specific guidance on particular types of modification and repair is to be found on the BMAA website.

6.5. Hired aircraft

Type-approved (factory-built) microlights can be hired out by flying clubs to club members. Aircraft may use an individual CAA Exemption or the generic exemption first issued April 2016. There are also additional operational and maintenance requirements. See TIL 032¹⁰.

⁵ BMAA Technical Information Leaflet 066 – Permit to Fly Revalidation – Process Guide

⁶ BMAA Technical Information Leaflet 039 – Amateur Build Kits – Process Guide

⁷ BMAA Technical Information Leaflet 012 – Preparing a Weight & CG Report

⁸ BMAA Technical Information Leaflet 002 – Applying for a Modification

⁹ BMAA Technical Information Leaflet 001 – Aircraft Repairs - Guidance

¹⁰ BMAA Technical Information Leaflet 032 – BMAA Code of Practice for Microlight Hire