

MICROLIGHT AIRWORTHINESS APPROVAL NOTE

MAAN NO:1741

ISSUE 1

DATE: 10 December 2003

TITLE: Microlight Airworthiness Approval Note 1741, X'Air Mk.1 and Mk.2 Aircraft - Service Bulletins SB 1741.1, .2 and .3.

Applicability: All X'Air Mk.1 and Mk.2

STAGE: Authorisation

1. INTRODUCTION

The X'Air is an amateur-built microlight aeroplane described in Microlight HADS HM1 and HM5.

The MAAN authorises the issue of three service bulletins, which are raised in response to concerns BMAA has regarding the continued airworthiness of these two types. These service bulletins are appendices to this MAAN and are numbered as follows:-

1741.1 X'Air Mk.1 and Mk.2 aircraft, inspection of elevator and rudder hinge brackets. This service bulletin is to be mandatory.

1741.2 X'Air Mk.1 aircraft, check on correct adjustment of ailerons. This service bulletin is to be mandatory.

1741.3 X'Air Mk.1 aircraft, reminder to operators of correct baggage compartment fitment, and correct operators manual. This service bulletin is to be advisory.

2. BASIS FOR APPROVAL

The basis for approval of both versions of the X'Air aircraft referred to in this MAAN is BCAR Section S issue 2.

3. DESCRIPTION

3.1 The elevator and rudder hinges of all variants of this aircraft consist in each case of a pair of stainless steel brackets, formed into a hinge by a single bolt through the pair. One of this pair of brackets has a double bend, in the corner of which pre-formed cracks are known to sometimes occur. BMAA's build-inspection regime for these brackets requires checking during build, and if cracks are found these are to be machined out to an internal radius. However, cracks are being found on flying aircraft, during annual

permit revalidation inspections, at an unacceptable rate indicating that a number of aircraft have been, and probably are, flying with cracked control hinges.

- 3.2 There is evidence that some builders and their inspectors of X'Air Mk.1 aircraft only have misinterpreted instructions requiring reflexing of the ailerons during setup of a new aircraft, and control deflection checking at subsequent maintenance and inspection intervals. The correct setup can be clearly defined and is also given in HADS HM1 at a new issue 20 (authorised by this MAAN). However in the meantime there may be some aircraft flying with miss-set ailerons (the effect being unacceptably shallow apparent longitudinal static stability), and also there is anecdotal evidence that due to severe misunderstandings some aircraft may have unauthorised alterations to turnbuckles in the aileron circuit - which if true would be unacceptable.
- 3.3 It has been discovered that some X'Air aircraft are not being operated with the correct UK operators manual. This is distinguished by an approval statement from the BMAA on the front cover. In addition, it has been discovered that some aircraft kits have been supplied with baggage compartments of a type specifically not approved, due to concerns about features of that component which may cause aircraft damage. Whilst this is all covered by existing technical documentation, particularly the relevant HADS and a note supplied with the kit by the kit importer, it is considered appropriate to issue a reminder to all opportunities of the authorised state of the aircraft and it's documentation.

4. TECHNICAL INVESTIGATION

- 4.1 It is BMAA's view that whilst it is acceptable to machine out pre-formed cracks prior to fitment of these brackets, once the components have been subjected to flight loads, it is not reasonably possible to predict the depth of any subsequent fatigue cracking, or whether any associated alteration to the microscopic structure of the metal is damaging. Equally, no data exists to predict the rate of crack propagation in these brackets. Whilst it would be possible to estimate these items, it isn't considered economic to do so by comparison with the cost of inspection and replacement of some very low value components. Therefore it is considered that all aircraft should be inspected as soon as possible, and any cracked brackets replaced.
- 4.2 It is known that incorrect setting of the ailerons on the X'Air Mk.1 aircraft can lead to incorrect apparent longitudinal static stability. This would make the aircraft atypical of type, which is unacceptable. In addition, there is a known risk that reduced aileron reflex can lead to near-neutral stability, which is also unacceptable. Therefore, whilst there is a significant chance that any aircraft may have incorrectly set ailerons, this must be investigated and rectified as soon as possible.
- 4.3 The BMAA approved operators manual exists because the original Indian operators manual was considered unacceptable, this position is unchanged and since some X'Air Mk.1 aircraft have been discovered being operated with the wrong manual, it must be

ensured that aircraft are being operated using the correct manual.

There is a baggage compartment available for the X'Air, which is sewn into the rear cockpit bulkhead and considered acceptable. The alternative device, which is available on aircraft being flown in France, has no top enclosure whilst being suspended above a primary control run and thus could lead to control jamming; also, the compartment has not been shown to comply with the structural requirements of Section S and has been considered unlikely to meet those requirements; also, the compartment is aft of the CG range and no measures have been taken to ensure that the aircraft does not exceed the aft CG range with it fitted and filled. For these reasons, fitment of this compartment is considered unacceptable.

5. FLIGHT TESTING

Not required.

6. MANUALS, PLACARDS AND INFORMATION

No amendment is required to any existing operating data.

Compliance with the three service bulletins shown at Appendices A to C of this MAAN is required.

7. NOISE CERTIFICATION

Not affected.

8. RADIO

Any aircraft radio installation is not affected by this note.

9. INSPECTION

To HADS HM1 or HM5 in their latest versions, plus the Service Bulletins attached as appendices to this MAAN.

10. WEIGHT AND BALANCE

Not affected (effects of removal of the unapproved baggage compartment are considered trivial since when empty it's effect upon empty W&CG are trivial).

11. SIGNIFICANT FEATURES AND LIMITATIONS

Not affected.

12. CERTIFICATION

I authorise issue of BMAA Service Bulletins No SB1741.1, SB1741.2, SB1741.3, which are contained at Appendices A to C of this MAAN.

I request CAA issue of one or more Mandatory Permit Directives (MPD) to support BMAA Service Bulletins MAAN 1741.1 and MAAN 1741.2

I authorise amendment of HADS HM1 to issue 20 to reflect the instructions contained within this MAAN.

Eur Ing G B Gratton
Chief Technical Officer
British Microlight Aircraft Association

Initial Distribution:

Full MAAN

CAA Aircraft Projects Dept (Gatwick)
CAA Applications and Certifications Section (Gatwick)
X'Air Mk.1 Post approval File
X'Air Mk.2 Post Approval File
MAAN File 1741.
Wessex Light Aeroplane Company.

Appendix A

All registered owners and ongoing builders of X' Air Mk.1 and Mk.2 aircraft.

Appendix B

All registered owners and ongoing builders of X' Air Mk.1 aircraft

Appendix C

All registered owners and ongoing builders of X' Air Mk.1 and Mk.2 aircraft

BMAA Service Bulletin No. SB 1741.1

10 December 2003

Subject: Mandatory inspection of elevator and rudder hinge brackets.

Applicability: All X'Air Mk.1 and Mk.2 aircraft.

Reason: The elevator and rudder hinges of all variants of this aircraft consist in each case of a pair of stainless steel brackets, formed into a hinge by a single bolt through the pair. One of this pair of brackets has a double bend, in the corner of which pre-formed cracks are known to sometimes occur.

Whilst this should have been eliminated at the build stage, a large number of aircraft are being found to suffer these cracks during the annual permit revalidation.

Compliance: Mandatory, before next flight (or first flight if aircraft is still under construction):-

Each elevator and rudder hinge must be carefully inspected. Cracks, when they occur, will normally be at the corner between two bends. Cracks may not be readily visible, but can be detected by running a fingernail along the edge of the bracket, particularly within that double bend corner. The fingernail will catch on the start of any crack.

If ANY cracking is found in ANY hinge bracket, that bracket must be replaced before any further flight.

If cracks are found in replacement brackets, it is permissible to repair them as described in the latest version of HADS HM20. This is not permissible on any bracket which has been subjected to flight loads.

Inspection: Inspection should initially be made by the aircraft owner, or a BMAA Inspector, and entered into the aircraft logbook. In addition if any component is modified or replaced, a duplicate check and signature by either a BMAA inspector or a second qualified pilot is required in the aircraft logbook before further flight.

At the next permit revalidation, compliance with this Service Bulletin must be confirmed by a BMAA inspector and a duplicate entry made in the aircraft logbook.

Signed:

Guy Gratton
Chief Technical Officer
British Microlight Aircraft Association

BMAA Service Bulletin No. SB1741.2

10 December 2003

Subject: Check on correct adjustment of ailerons

Applicability: All X'Air Mk.1 aircraft.

Reason: (1) It is believed that aileron reflex has not been correctly set on some X'Air Mk.1 aircraft. Incorrectly set ailerons can give unsafe handling qualities.

(2) It has been indicated to the BMAA that in order to comply with incorrect interpretations of the requirement for aileron reflexing of some X'Air Mk.1 aircraft, unauthorised modifications may have been made to the aileron adjustment turnbuckle located in the upper fuselage just behind the wing trailing edge.

Compliance: Mandatory, before next flight (or first flight if aircraft is still under construction):-

- (1) Aileron reflex must be checked. The correct setting is a nominal 7.5° (within 1.5° of this is acceptable) trailing edge up. This is measured with the stick central (ailerons parallel). The lower surface of the aileron at the inboard end must be between 6° and 9° trailing edge up compared to the underside edge of the longitudinal wing tube which connects the wing leading and trailing edges and protrudes below the lower wing skin at about half span. If the setting is incorrect, then it must be reset to within limits by adjusting the aileron adjustment turnbuckle located in the upper fuselage just behind the wing trailing edge.
- (2) The aileron adjustment turnbuckle must be inspected visually. If there is any indication (for example cutting of the threaded ends) that it has been modified, the turnbuckle must be replaced before further flight.

Inspection: Inspection should initially be made by the aircraft owner, or a BMAA Inspector, and entered into the aircraft logbook. In addition if any adjustment is made to the ailerons or the turnbuckle replaced, a duplicate check and signature by either a BMAA inspector or a second qualified pilot is required in the aircraft logbook before further flight.

At the next permit revalidation, compliance with this Service Bulletin must be confirmed by a BMAA inspector and a duplicate entry made in the aircraft logbook.

Signed:

Guy Gratton
Chief Technical Officer
British Microlight Aircraft Association

BMAA Service Bulletin No. SB1741.3

10 December 2003

Subject: **Reminder to operators of correct baggage compartment fitment, and correct operators manual.**

Applicability: **All X'Air Mk.1 and Mk.2 aircraft.**

- Reason:**
- (1) BMAA has become aware that some X'Air kits have been supplied with the wrong operators manual. The correct operators manual has an approval statement by the BMAA on the front cover. For the X'Air Mk.1 this is at issue 1 AL1, for the X'Air Mk.2 this is at issue 1 AL0. The manual should be in it's own binder with the various information applicable to the aircraft contained in the lettered annexes.
 - (2) BMAA has become aware that some X'Air kits have been supplied with an unapproved baggage compartment which is considered dangerous. The ONLY baggage compartment approved for use on X'Air aircraft is a type sewn-in to the cockpit bulkhead and placarded "max 3kg". Any other type is unapproved and potentially dangerous.

Compliance: This service bulletin is issued as advice to aircraft owners and their inspectors. They are reminded that if they do not have the correct operators manual they should obtain it as soon as possible from the importer (Wessex Light Aeroplane Co.) and that permit revalidation cannot be signed off by a BMAA inspector if the correct manual, fully made-up, is not available. Similarly they are advised that unapproved baggage compartments (all unapproved versions seen so-far by BMAA have been supported on parallel rods suspended between fuselage stringers behind or above the fuel tanks) are not only unauthorised modifications, but are potentially very dangerous. Compartments formed by a zipped pouch in the bulkhead with maximum load capacity of 3kg are acceptable.

The Wessex Light Aeroplane Co. has advised the BMAA that they intend to submit a modified version of this baggage compartment for approval, and that it is likely that all supplied compartments can be modified in the near future to an approvable standard. Owners are therefore advised not to discard these compartments once removed from the aircraft.

Inspection: Inspectors are reminded that permit revalidation should not be signed off without sight of the approved operators manual in the correct issue state as shown on the HADS, or with the fitment of an unapproved baggage compartment.

Signed:

Guy Gratton
Chief Technical Officer
British Microlight Aircraft Association