AIRWORTHINESS APPROVAL NOTE NO: 23042 Issue 3

APPLICANT: Cyclone Airsports Ltd

AIRCRAFT TYPE: Cyclone AX3/503

REGISTRATION NO: G-MYER

CONSTRUCTOR'S NO: CA 001

Type Approval of the Cyclone AX3/503
3 Axis Microlight Aeroplane and Approval for a Permit to Fly

1. Introduction:

The two seat Cyclone AX3/503 3 axis microlight aeroplane is based upon the Ultralair Premier AX3 design. This French Ultralight is, in turn a derivative of the original American Weedhopper 2 axis machine.

This AAN covers the details of approval for the type and recommends the issue of a Permit to Fly for the prototype, Con. No.CA001

Issue 2 of this Approval Note will contain specific details relating to production aircraft.

CAA Type Approval Data Sheet (TADS) No.BM45 refers to this aeroplane.

Issue 3 was raised to extend the forward CG limit.

2. Description:

The Cyclone AX3/503 is of conventional layout. It has a high keel tube running the length of the airframe to which are mounted all the major components (i.e. the engine, the wings and the empennage). It is generally similar in layout to the existing Thruster, although the AX3 has a tricycle undercarriage arrangement. It is powered by a Rotax 503 upright air cooled engine rated at 52 bhp at 6500 rpm. This drives a GSC Tech II 64 inch diameter ground adjustable 2 blade propeller (set to 46 inch pitch). This propeller has wooden blades, plastic root fittings and an aluminium hub.

It has a side by side seating layout with a single centrally mounted stick and two sets of rudder pedals. The aircraft is fitted with a non-structural cockpit fairing and has forward hinged removable doors. There is a single 28 litre fuel tank mounted on the back of the right-hand seat. The main undercarriage tube is of composite construction.

The aeroplane is generally constructed of D65S Aluminium tube (equivalent to 6261 T6) covered (on both the wings and fuselage) by "ULTRALAM" man-made fabric. This (155 gsm) material consists of a polyester substrate with a PVF film covering and is produced by GTS Flexible Materials Ltd., Bracknell.

The two spar, double-surface wing has the profile formed by battens, rather than ribs. There is a conventional elevator trim tab fitted to the aircraft. It has no flaps.

The Cyclone AX3/503 microlight is largely manufactured by Ultralair SA in France. The modifications to the French design found to be necessary for full compliance with BCAR Section S have been incorporated into the declared UK design standard. This is controlled exclusively by Cyclone Airsports and is used by Ultralair SA for the manufacture of the UK machines.

3. Basis for Approval:

The Cyclone AX3/503 has been assessed against BCAR Section S Advance Issue, March l983 as revised ll October l988. CAA paper S866 was also used as a basis for establishing an acceptable test factor for the composite components.

Statements of absolute compliance with Section S have been accepted for all except the following requirements:-

S 23	a)	Load Distribution Limits
S474		Landing Case - Strength
S689	b)	Cable Systems

Either alternative means of compliance or derogations have been accepted for these, as detailed in paragraph 4 below.

4. Technical Investigation:

A formal Type Approval process has been carried out with this microlight aeroplane.

The resulting type approval data is given in CAA TADS No.BM45

4.1 The submitted documents forming the basis of the approval are as follows:-

4.1.1 Design & Structural Substantiation:

The bulk of the compliance submission is contained in Cyclone Airsports Compliance Checklist, document TAS/AX3/1/92, at Issue 4.
It contains the details of compliance with subparts A,C,D,E,F,G and J of Section S. The Appendices to this report contain details of the structural and functional tests forming the basis of the compliance statements.

4.1.2 Flight Test Substantiation:

The document Cyclone AX3-Flight Test Report at Issue 1 as amended by Cyclone Airports letter of 12 August 1992 gives the details of the tests conducted to demonstrate compliance with Subpart B of
Section S.

4.1.3 Definition of Design:

The Cyclone AX3/503 design standard is defined by "top drawing" document reference AX3-001 at Issue 1.

This document gives details of all the drawings comprising the design standard, both those originally drawn by Ultralair SA (and adopted as part of the UK design) and those generated by Cyclone Airsports themselves.

4.1.4 Owners Manual:

Cyclone AX3/503 Owners Manual Issue 1 contains the information required by Section S from both the Pilots Handbook and the Maintenance Manual.

4.2 Alternative means of Compliance and Derogations

4.2.1 Load distribution limits (S23a))

Due to the lack of availability of a suitable pilot the full declared range of centre of gravity positions at minimum weight was not demonstrated. Sufficient arguments have been presented by Cyclone Airports for this to have been deemed acceptable. Also see paragraph 4.4.

4.2.2 Landing Case - Strength (S474)

The conditions upon which the testing of the composite main undercarriage axle has been accepted are given in CAA Internal Memo on the subject of 21st May 1992.

4.2.3 Cable Systems (S689b))

Neither the aileron or rudder pulley banks in the vicinity of the control stick are in agreement with the recommendations of the interpretation material to S689b).

These pulley has been accepted in this instances based upon their satisfactory usage in the existing French Ultra light aircraft and by 'hard lifing' both sets of cables in the maintenance schedule.

4.3 Differences between Con. No. CA001 and the Type Approved Design Standard

The prototype aircraft CA001 differs from the design standard (ref 4.1.3 above) in the following respects:

The airspeed indicator reads in km/h, rather than mph.

Two fuel pressure gauges are included on the panel.

Alternative wing mounting positions are present on the keel tube, resulting from development work during type approval.

Strut fittings have welded undercarriage stop pick ups.

Main undercarriage tube has additional mounting holes.

Rear Wing struts have additional mounting holes.

Aileron cable is spliced.

4.4 Extended forward CG position

BMAA MAAN 1510 Issue 1 dated 19 June 2000 approves the extension to the forward CG position from 866 mm AOD to 849 mm AOB. The aircraft's manufacturer has issued a statement of no technical objection. Pegasus Flight Test Report FTR/AX3/CG/14600 dated 14/6/00 refers.

5. Weight & Balance:

The weight on Centre of Gravity envelope for the type is as defined in the Owners Manual referred to in paragraph 10. The forward CG limit shall be changed from 866 mm to 849 mm.. The maximum weight is unchanged.

6. Noise:

Noise Type Certification No.141 M has been issued for this aeroplane type fitted with a Rotax 503 upright air cooled engine and GSC Tech II 2-bladed (square tip) propeller, 64 inch diameter, set at 46 inch pitch.

7. Radio:

The design standard does not include radio equipment or aerial installations.

An external comms aerial mount is fitted, however to the aircraft as standard.

8. Flight Testing:

Details of the test flying undertaken by Cyclone Airsports are covered in paragraph 4.1.2.

Details of the CAA evaluation flight test for Type Approval are given in CAA Test Report FTR/8346P, dated l0th July 1992. The report concludes that the aircraft's flying qualities were acceptable for the issue of a Permit to Fly.

9 Placards & Limitations:

As detailed in CAA TADS BM45 Issue 3 or later revision.

10. Flight Manual/Maintenance Manual:

Reference paragraph 4.1.4.

11. Inspection:

The aeroplane has been inspected by the CAA and was found to conform to the Cyclone AX3/503 Type Approval Data Sheet No. BM.45 Issue l and to the drawing schedule referred to in paragraph 4.1.3 as amended by 4.3.

12. Approval:

This aeroplane G-MYER, constructors number CA001 and any other of the type is approved for the issue of a Permit to Fly provided it is operated in accordance with the manual referred to in paragraph 10 of this AAN and to the TADS.

R J Hardy
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Surveyor (Inspection)(Avionics)

Date 22 June 2000