LAA TYPE ACCEPTANCE DATA SHEET
TADS 301B
DYN AERO MCR-01 ULC

Issue 3	Changes to manufacturer's/importer's details. New format. Addition of MPD 2011-002-E. Addition of MOD/301/021, /022 and /023. Manufacturer's service information updated.	Dated 03/10/16	JV

These TADS are intended as a summary of available information about the type and should be used during the build, operation and permit revalidation phases to help owners and inspectors. Although it is hoped that this document is as complete as possible, other sources may contain more up to date information, e.g. the manufacturer's website.

Section 1 contains general information about the type.
Section 2 contains information about the type that is **MANDATORY** and must be complied with.
Section 3 contains advisory information that owners and inspectors should review to help them maintain the aircraft in an airworthy condition. If due consideration and circumstances suggest that compliance with the requirements in this section can safely be deferred, is not required or not applicable, then this is a permitted judgement call. This section also provides a useful repository for advisory information gathered through defect reports and experience.

Section 1 – Introduction

1.1 UK contact

There is no UK importer at the current time.

1.2 Description

The MCR01 series is a single-engined two-seat monoplane design of composite construction, developed from the Colomban Ban-bi design, both designs having been developed in France. The Dyn-Aero MCR-01 ULC variant of the aircraft is fitted with wings and tailplane of greater area and a different wing section to that of the original MCR-01 VLA and Club variants, to reduce the stall speed and so bring it into the microlight category, and separate double slotted flaps and ailerons rather than combined flaperons.

The fuselage is a two-part moulding, split horizontally, with a fin skin moulded integral with the upper fuselage half and the firewall integral with the lower half. A fuel tank is fitted between the instrument panel and the firewall. A one-piece canopy is fitted over the cockpit, hinged at the front, allowing straight-forward access to the side-by-side seating arrangement. The horizontal tail is in a T-tail arrangement on top of the fin, and is a one-piece all-flying surface, fitted with a trailing edge anti-balance tab. The wing is in two pieces and the wing panels are easily deriggable from the fuselage using a glider-style overlapping spar-tang design. The wing panels are fitted with large-span double-slotted flaps, and ailerons. This aircraft is fitted with a quick-disconnect on the flap and aileron systems which allows the aircraft to be easily rigged and de-rigged without the need for independent inspection.

The fuselage shell halves are manufactured from a multi-axial stitched carbon-fibre cloth and are moulded with an epoxy resin using the wet lay-up technique, vacuum bagged during cure for consolidation. Unidirectional carbon fibre stiffeners are used at the bottom and the top of the lower hull. These stiffeners form the longerons of the

fuselage. The fuselage frames carrying undercarriage and wing attachments are manufactured from wood with carbon fibre faceplates. All other fuselage frames are +/-45 degree carbon/epoxy/foam sandwich construction. Each wing panel has a box spar manufactured with +/- 45 degree carbon fibre shear webs and pultruded carbon-fibre/epoxy spar caps of variable thickness, the whole assembly being epoxy-bonded together under pressure. The root-rib of the wing is manufactured from stamp-moulded woven carbon-fibre/epoxy, while the remaining ribs are from 6mm thick PVC foam, close pitched to provide support against wrinkling for the one-piece sheet aluminium skins. The tailplane has a similar construction to the wings, although the skins are available manufactured from either woven carbon fibre or sheet aluminium. Either design of skin is acceptable. Carbon-fibre ribs are used at the centre of the tailplane to react torque loads into the control rod.

The vertical tail has upper and lower ribs manufactured from carbon-fibre, while the intermediate ribs are from PVC foam. The rear spar of the fin is manufactured from UD carbon caps with a +/-45 degree carbon-fibre shear-web. The rudder, flaps and ailerons are manufactured from a one-piece wrap-around aluminium skin with a PVC foam spar and carbon fibre ribs at point load attachments, with PVC foam intermediate ribs. The aluminium skin is bonded and riveted at the trailing edge. Woven carbon fibre skins are an acceptable factory option.

The aircraft has a fixed tricycle undercarriage. The main undercarriage is a one-piece carbon-fibre/glass/epoxy cantilever spring, while the noseleg is made up of telescopic steel tube.

The engine type accepted by the LAA on the ULC is the Rotax 912-ULS, normally with ground adjustable Ecoprop 162R130/3 propeller (set at a pitch angle of 27 degrees measured at 75% radius).

Note that the only propeller(s) approved for an individual aircraft are those listed on the individual aircraft's Operating Limitations document or in the PTL/1 (Propeller Type List) for the type.

Section 2 – Mandatory information for owners, operators and inspectors

At all times, responsibility for the maintenance and airworthiness of an aircraft rests with the owner. Condition No 3 of a Permit to Fly requires that: *"the aircraft shall be maintained in an airworthy condition".*

2.1 Fast Build Kit 51% Compliance

The LAA technical leaflet TL.11 shows the contents of the accepted fast build kit.

2.2 Build Manual

The build manual is provided on a CD supplied by the manufacturer with the kit.

2.3 Build Inspections

Build inspection schedule 34 (Dyn Aero MCR 01).
Inspector approval codes A-A orAC-1 or K. Inspector signing off final inspection also requires 'first flight' endorsement.

2.4 Flight Manual

Flight Manual supplied by factory.

The test pilot of the first UK aircraft G-BZXG compiled a flight-manual supplement for the type, which all pilots should note. Copies of this are available from LAA.

2.5 Mandatory Permit Directives

Applicable specifically to this aircraft type:

1999-013	Elevator trim tab control	This MPD refers to DGAC AD 1999-385 which in turn refers to Dyn-Aero Bulletin Service BS 20 1 0001. This requires removal of the tailplane and removal of the rod lower attachment to perform inspection of the rivets attaching the rod ends to the control rod. There should be no play. This inspection is required every 50 hours.
2005-013	Replacement Baumeister flap servo motor	With effect from 31/12/05, use of the Baumeister flap drive motor fitted with the John Scott flap operating system is not permitted. An alternative, approved by the LAA, must be installed. LAA letter to owners Mr Bishop, Greenwood and Scott re mod 11744 and MPD 2005-013 Baumeister Motor refers, also LAA MOD/301/019 refers.
2005-014	Installation of audible stall warner	With effect from 31/12/05 all LAA Dyn-Aero MCR-01 aircraft must be fitted with an audible stall warning device. See LAA MOD/301/018.
2008-002	Tailplane attachment failure	With effect from 8/2/08, the tailplane attachment brackets of all MCR-01 variants must be modified before further flight (LAA MOD/301/020 refers). The modification method used depends on the type of tailplane attachment brackets fitted to the aircraft.
2011-002-E	Aluminium fittings – Inspection	With effect from 20/4/11, all LAA Dyn-Aero MCR-01 aircraft must be inspected for integrity and security of metal fittings (LAA MOD/301/022 refers).

Also check the LAA website for MPDs that are non-type specific (TL2.22).

2.6 LAA Required Modifications (including LAA issued AILs, SBs, etc)

MOD/301/001	Extra reinforcement of lap strap attachments. The seat belt attachments to the fuselage have been reinforced by laminating additional plies of carbon fibre over the aft ends of the bathtub fittings, to improve impact resistance. The seat-belt attachments to the fuselage have been reinforced by laminating additional plies of carbon fibre over the aft ends of the bathtub fittings, to improve impact resistance. Not required after Kit #130 as improvement

	incorporated as standard.
MOD/301/002	External door handles required. Factory optional external door handles or equivalent required to be installed. These should be easily opened from outside the aircraft without additional equipment.
MOD/301/003	Wire–lock flapperon quick-release connectors so they cannot disengage in flight.
MOD/301/004	Wire-lock the elevator anti-balance tab hinge pins, or use two M3 plain nuts locked together and Loctite adhesive.
MOD/301/005	Protect wooden cappings of wing spar tangs with varnish (or thin cope of dope followed by wax polish has been found satisfactory for ease of rigging/de-rigging). Procedure is now specified in the aircraft build manual.
MOD/301/006	Rudder horn/cable attach bolts must be retained by castle nuts and split pins rather than stiffnuts, as should any other bolts where rotation occurs around the bolt. Now factory standard.
MOD/301/007	Bolts replace blind rivets in tension for the attachment of the pitch control rod bracket to the leading edge of the tailplane. Now factory standard.
MOD/301/008	Placard seat adjustment to stress importance of proper engagement
MOD/301/009	Fit baggage compartment covers / FOD guard to prevent loose objects in cockpit jamming in flap system or rudder cables. Factory option or equivalent is mandatory. The system must be fitted between frames 4a, 4b, 5 and 6 and a guard must also be fitted to the pulley behind frame 6.
MOD/301/010	Quick release connector in pitot-static system (if fitted) to be of type acceptable to the LAA. An approved connector is available from Lyndhurst Touchdown Services, the UK kit agent.
MOD/301/011	Fuel drain must drain fuel overboard. Factory standard on all models.
MOD/301/012	Pitch trim indicator to be fitted if pilot-controllable elevator trim tab is installed. N/A to VLA Spotster model if factory standard bias spring pitch trim system fitted as provided the aircraft is correctly configured the control stick may act as the indicator, i.e. ensure that control stick neutral position is vertical prior to take-off.
MOD/301/013	Padding to be added to cockpit combing over instrument panel to provide protection from head injury in a forward impact.
MOD/301/014	Rivetting of trailing edges of controls and wing trailing edges, now factory standard ref 'Gammes de rivetage voilure et gouverne MCR-01'. Not required on carbon skinned control surfaces.
MOD/301/015	Flap deflection reduced to 35 degrees maximum.
MOD/301/016	Engine mount diagonal brace – new reinforced part to be fitted
MOD/301/017	Nose Landing Gear Check (ref Dyn Aero BS 05 J 0027)
MOD/301/017A	To avoid possibility of control restrictions in flight, ensure adequate spanwise clearance exists between aileron and flaps – minimum 3mm.
MOD/301/018	Mandatory Stall Warning System Installation (ref Dyn Aero BS 05 H 0026)
MOD/301/019	Flap Drive Motors Fitted to Modified MCR01 CLUB and MCR01 ULC Aircraft.
MOD/301/020 (issue 4)	Replacement of tailplane attachment lugs
MOD/301/021	Inspection of mainplane control surface attachment brackets.
MOD/301/022 (issue 2)	Inspection of aluminium fittings for integrity and security.
MOD/301/023	Disassembly and inspection of flapperon drive screws and carriage threads.

2.7 Additional engine operating limitations to be placarded or shown by instrument markings

Notes:
- Refer to the engine manufacturer's latest documentation for the definitive parameter values and recommended instruments.
- Where an instrument is not fitted, the limit need not be displayed.

With Rotax 912-ULS engine: Maximum CHT: 135°C
Max Coolant Temp: 120°C (with 50/50 Glycol/water coolant)
Oil Temp Limits: 50°C to 130°C (Normal 90-110°C)
Oil Pressure 2-5 Bar
Minimum Fuel Pressure: 0.15 bar

2.8 Control surface deflections

Ailerons	Up: 20° ±1° Down: 10° ±1°
Tailplane	Up: 10° +2°/-0° Down: 3.5° +1°/-0°
Rudder	Left: 20° +0°/-2° Right: 20° +0°/-2°
Flap	Down: 35° +0°/-1°

2.9 Operating Limitations and Placards

(Note that the wording on an individual aircraft's Operating Limitations document takes precedence, if different.)

1. Maximum number of occupants authorised to be carried: Two

2. The aircraft must be operated in compliance with the following operating limitations, which shall be displayed in the cockpit by means of placards or instrument markings:

2.1 Aerobatic Limitations
The aeroplane is permitted to fly only for non-aerobatic operation. In this context non-aerobatic operation includes:
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.
Intentional spinning is prohibited.

2.2 Loading Limitations
Maximum Total Weight Authorised: 450 kg
CG Range: forward limit 211 mm aft of datum at gross weights up to 400 kg, 288 mm aft of datum at gross weight of 450 kg, with linear variation between 400 and 450 kg. Aft cg limit 384 mm aft of datum at all weights.
Datum Point is: a point 13.5 mm forward of the left wing leading edge at root (which is the mean of leading edge of port and starboard wings)

2.3 Engine Limitations
Maximum Engine RPM: 5800.
Maximum continuous engine RPM: 5500.

2.4 Airspeed Limitations
Maximum Indicated Airspeed (VNE): 160 kts
Max Indicated Airspeed Flaps Extended, 0-17°: 76 kts
17-45°: 67 kts
Maximum Indicated Airspeed, Rough Air (VNO): 113 kts

2.5 Other Limitations
The aircraft shall be flown by day and under Visual Flight Rules only.
Smoking in the aircraft is prohibited.

Additional Placards:

Cockpit placard to be fitted stating 'This is a high performance aircraft and it is recommended that pilots unfamiliar with this class of aircraft should undergo type conversion training prior to flying as pilot in command.'

"Occupant Warning – This Aircraft has not been Certificated to an International Requirement"

A fireproof identification plate must be fitted to fuselage, engraved or stamped with aircraft's registration letters.

2.10 Maximum permitted empty weight

Model	*Engine*	*Max empty weight*
MCR-01 ULC	Rotax 912-ULS	265 kg

Section 3 – Advice to owners, operators and inspectors

3.1 Maintenance Manual

The manufacturers supply a maintenance manual.

3.2 Standard Options

- The tailplane skins and control surface skins are available manufactured from either woven carbon fibre or sheet aluminium. Either design of skin is acceptable.
- An alternative flap system option is available, designed by Mr John Scott. When fitted with this flap system, modifications are also required to the pitch trim system because the modified flap operating system displaces the normal location for the trim drive system between the seats. LAA must be consulted if this alternative flap system is planned.
- The version of the factory flap system known as the 'Hybrid' flap system which combines the latest two flap motor arrangement with an earlier design for the bearings in which the various rotating parts run. The 'Hybrid' system is used if the builder wishes to use the latest flap drive system but the aircraft kit is relatively early and the fuselage frames have not been manufactured with bearing housings

suitable for installation of roller bearings as per the latest scheme. Instead, plain bearings are used as per the earlier flap system which utilised four drive motors rather than two. The reason for the change is to reduce friction in the flap operating circuit by an alteration of the belt tensioning system so that two drive motors rather than four can be used, with a resulting simplification of the flap system.

- Quick release flap system connection, reference OPLPAU0.
- Later, stronger MCR-01 4S type noseleg (not directly interchangeable with earlier version but can be adapted).
- Hand operated hydraulic brakes.

3.3 Manufacturer's Information (including Service Bulletins, Service Letters, etc)

In the absence of any over-riding LAA classification, inspections and modifications published by the manufacturer should be satisfied according to the recommendation of the manufacturer. It is the owner's responsibility to be aware of and supply such information to their Inspector.

Ref	*Date*	*Description*	*Factory compliance status*
BS 20 I 0001	14/09/99	Tab Rod	Mandatory
BS 20 I 0001 R1	09/04/04	Tab Rod	Mandatory
BS 20 I 0002	21/09/99	Main landing gear wheel bolts	Recommended
BS 20 I 0003	21/09/99	Main landing gear silentblocs	Recommended
BS 20 I 0004	21/09/99	R912 air intake security valve fixing	Mandatory
BS 20 I 0005	21/09/99	Seat belts attachment bracket reinforcement	Mandatory
BS 20 B 0006	14/02/00	Tailplane stiffener plate riveting check	Mandatory
BS 20 B 0007	16/02/00	Flap control system play control	Mandatory
BS 20 C 0008	30/03/00	JPX (BS CSB 662A) Magneto capacitors	Mandatory
BS 20 F 0009	05/06/00	Capacitor wiring	Recommended
BS 21 F 0012	29/06/01	Tailplane trim carriage	Mandatory
BS 22 I 0013	07/09/01	Unleaded gasoline operation	Recommended
BS 22 E 0015	27/05/02	Flap lead screw universal joint split pin control	Mandatory
BS 03 C 0017	10/03/03	Main landing gear drum brake control	Mandatory
BS 03 K 0018	12/11/03	Check of the rivet of the canopy locking system	Mandatory
BS 04 D 0020	23/04/04	Check of adhesive tapes covering parachute straps	Mandatory
BS 04 F 0021	14/06/04	Clearance check between wheel and main Landing gear	Mandatory
BS 04 F 0022 R1	04/04/06	Two seater MCR main fuel tank leak	Mandatory
BS 04 F 0023	29/06/04	Installation of flap control system	Recommended
SI 05 L 0003	20/12/04	Ignition key-switch ACS A-510-2	[not stated]
BS 05 J 0027	10/10/05	Front landing gear leg check	Mandatory
BS 06 C 0028	20/03/06	Carburator air intake manifold check	Mandatory
BS 06 L 0030	22/12/06	High lift devices	Recommended

BS 08 B 0034	15/02/08	Elevator attachment fittings	Mandatory
BS 08 B 0034 R2	21/05/12	Elevator attachment fittings	Mandatory
BS 08 D 0035	10/04/08	Front landing gear leg	Mandatory
BS 08 D 0036	21/04/08	Flight manuals update: instruction for the use of the 45° flap position	Mandatory
SI 09 I 0001	14/09/09	Recommendations regarding the use of fuels for MCR aircraft	Information
BS 11 G 0001	11/07/11	Inspection of pitch control surface trailing edge and stiffener bonding	Mandatory
BS 6511002	29/09/11	Possibility of aileron jamming by the trim hinge	Mandatory
BS 13 E 0044	09/04/13	Flaps control system	Mandatory

3.4 Special Inspection Points

- Undercarriage noseleg for signs of damage. The noseleg is rather fragile in appearance and should be checked for distortion / damage particularly following any heavy landing. (ref Dyn Aero BS 05 J 0027).
- Security of fixed noseleg lower bush. Hold down tail of aircraft to raise nosewheel off the ground, and attempt to rock the nosewheel fore and aft, looking for signs of free play.
- The flap system is unusually complicated for an aircraft in this category, consisting of electric motors, pulleys and toothed drive belts. The system needs careful attention to maintenance and inspection to preserve the integrity of the system. Any failure which causes asymmetric flap operation would cause serious control problems in flight and must therefore be avoided at all cost.
- Problems have been experienced with failure of the very lightweight engine mount cross brace. Possibly due to engine shake during start-up and shut-down. The condition of the engine mounting cross brace must be monitored carefully in service for any signs of cracking or bending, and repaired or replaced immediately if damage is found. The Engine mount and cross brace must be painted white and flexible type coatings avoided, otherwise cracks may not be visible before a complete failure occurs.
- Owners and inspectors should remain aware of the importance of proper corrosion protection on bare metal components, and continued vigilance for its effectiveness. The principal cause of failure of the tailplane brackets in the Banbi crash referred to in MPD 2008-002 was identified by the AAIB as stress corrosion. The brackets were new but the AAIB (Bulletin 2/2009 G-BZXG) say there were a number of factors which may have predisposed the brackets to the onset of stress corrosion. Among one of the possible factors was poor corrosion protection. No evidence was found of any surface conversion process such as anodising having been applied to the lugs. No primer had been used and the top coat of paint was not well adhered. The manufacturer's maintenance programme for the aircraft requires a check of the security of the tailplane attachments to be performed every 50 hours and calls for the tailplane attachment lugs to be greased at 3 month intervals.

3.5 Special Test Flying Issues

- Because of the high performance of this aircraft, and the associated limitations concerning the maximum rough airspeed (VNO), pilots must be educated as to

the significance of the yellow arc marking on the ASI. The majority of homebuilt aircraft are not limited by a rough airspeed. In view of this, and other high performance issues, a placard has been called for to advise pilots of the need for proper conversion training before flying an aircraft of this type.

- During flight testing it was noted that the factory pitch trim range was excessive, and a procedure has been written reference 'G-CCMM Trim Limit Setting' dated 19 January 2004 to establish satisfactory trim limits.
- The flight characteristics of the aircraft have been checked at 45 degrees of flap and have been found to be acceptable. Dyn Aero have since raised a service bulletin BS 06 L 0030 which calls for reducing the flap travel due to stall handling characteristics with full flap. LAA accepts reducing the flap deflection in accordance with the service bulletin, by relocating the flap travel limit microswitch/stops to 35 degrees travel.
- The test pilot of the first UK aircraft G-BZXG compiled a flight-manual supplement for the type, which all pilots should note. It should be noted that the pitch stability of this design is influenced by the set-up of the control system specifically the correct setting of the anti-balance tab on the horizontal tail and the elastic band trim system. G-BZXG was modified by combining the pitch trim with the anti-servo tab. As such, the observations regarding pitch stability are directly relevant only to G-BZXG. However, the more global observations about the aircraft's performance will be applicable to all of type.

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Please report any errors or omissions to LAA Engineering: engineering@laa.uk.com