LAA TYPE ACCEPTANCE DATA SHEET
TADS 162A
ZENAIR CH 601UL

Issue 6	New format	Dated 21/11/16	JV
Revision A	Addition of Safety Spot articles, changes to kit supplier details	Dated 10/10/19	JH

This TADS is 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 the LAA considers 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

Metal Seagulls Ltd

Tel: 07502 593671/0121 3644437
Email: info@metalseagulls.co.uk
Website: www.metalseagulls.co.uk

(Kits were previously supplied by Gary Johnson of JMS Aero.)

Manufacturer's website: www.zenair.com

1.2 Description

The Zenair CH601-UL is a small two-seat, low-wing microlight aeroplane of all riveted aluminium construction, manufactured by Zenair in Canada and Czech Aircraft Works in the Czech Republic and supplied in standard or quick-build kit form, originally through Lewis Aviation Sales. The LAA acceptance of the type at present only covers the kit as supplied by CZAW. The only engine models currently approved in the UK for use in the CH 601UL are the Rotax 912-UL and Rotax 912-ULS. Standard propeller used are the Woodcomp Varia 170-2-R 1700mm diameter and Woodcomp Klassic 170-R. 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.

The CH601-UL is a microlight aeroplane with a maximum gross weight of 450 kg.

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 technical leaflet TL.11 shows the contents of the accepted fast build kit. Note that it is essential that the fuselage turtle-decks and the closing skins for all flying surfaces are supplied in un-rivetted condition so that the inspector is able to inspect the 'open' assemblies and so that the builder is tasked with riveting these skins in place as part of the 'major portion' requirements.

At this time, use of the CZAW 'builder assist program' is not acceptable pending agreement over the extent of work which can be done with commercial assistance without compromising the 'major portion' rule.

2.2 Build Manual

Drawings – CZAW supplied version of Zenair CH601-UL drawings, plus supplement describing installation of split flaps which are mandatory on the CH 601UL in the UK to achieve microlight stall speed requirement.

Construction Manual 'Building your own Zenair CH601'.

2.3 Build Inspections

Build inspection schedule 2 (Metal aircraft).
Inspector approval codes A-A, A-M, K or M. Inspector signing off final inspection also requires 'first flight' endorsement

2.4 Flight Manual

CH601 Flight Manual available from Zenair. Note also applicable CZAW flight manual supplement regarding use of the split flaps on the CH 601UL variant.

2.5 Mandatory Permit Directives

None applicable specifically to this aircraft type.

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)

Several modifications were required by the LAA for acceptance of the type in the UK, as follows:

LAA-162A-001 Flap operating lever wall thickness increase to 0.058" (CZAW

	supply)
LAA-162A-002	Firewall moved forward 50mm to improve cg position (optional/recommended)
LAA-162A-003	Ensure low friction in elevator/rudder controls
LAA-162A-004	Addition of nosewheel centring springs (n/a to tailwheel version)
LAA-162A-005	Flying control system, substitution of aircraft turnbuckles in control cables.
LAA-162A-006	Modification to side-hinged canopy latching to prevent accidental opening.
LAA-162A-007	Centre of gravity rear limit restricted to 17.5 inches aft of datum.

Additional mandatory bulletins issued by LAA:

MOD/Prop/04-005	Mandatory change to Woodcomp Klassic Propellers to replace any blades prior to serial number 600.
MOD/162/008	Zenair 601 Fuel Cocks (Andair fuel cock to be fitted if stops or detents not satisfactory with existing fuel cock).
MOD/162A/009	Engine frame cracking

Letter to owners dated 5.11.03 stating that a vapour return line must be fitted to the fuel system if unleaded Mogas fuel is to be used. This returns the excess fuel and vapour to the main fuel tank. Returning it to the fuel supply pipe downstream of the tank outlet is not acceptable.

With the centre of gravity rear limit being 17.5 inches aft of datum (and particularly as restricted by LAA to 16.5" on HD model due to longitudinal stability requirements) it is recommended that when using the Rotax 912-UL or 912-ULS engine, the option of the firewall being moved forward 50mm to improve empty cg position is used to allow more baggage to be carried in the baggage bay behind the seats without falling outside the rear cg limit. Otherwise the baggage weight capability may be very restricted especially when flying with a passenger.

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

With Rotax 912-UL engine:

Maximum CHT: 150°C
Max Coolant Temp: 120°C (with 50/50 Glycol/water coolant)
Oil Temp Limits: 50°C to 140°C (Normal 90-110°C)
Oil Pressure: 2-5 Bar
Minimum Fuel Pressure: 0.15 bar

2.8 Control surface deflections

Ailerons	Up: 12-15° Down: 12-15°
Elevators	Up: 27-32° Down: 27-32°
Elevator tab	Up: 30° Down: 30°
Rudder	Left: 23-28° Right: 23-28°
Flap	Down: 30-35°

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: 11 inches to 17.5 inches aft of datum point
   Datum Point is: the leading edge of the wing

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

   2.4 Airspeed Limitations
   Maximum Indicated Airspeed (V_{NE}): 150 mph
   Flap limiting speed: 70 mph

   2.5 Other Limitations
   The aircraft shall be flown by day and under Visual Flight Rules only.

Additional Placards:
"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.

As a microlight aircraft, additional microlight weight placard must be fitted as described in TL2.11 regarding empty weight and payload.

2.10 Maximum permitted empty weight

Model	*Engine*	*Maximum empty weight*
CH 601UL	Rotax 912-UL	268 kg
CH 601UL	Rotax 912-ULS	265 kg

Section 3 – Advice to owners, operators and inspectors

3.1 Maintenance Manual

Nil. In the absence of a manufacturer's schedule for the airframe, refer to LAMS schedule. For airframe rigging information consult build manual and drawings. For engine maintenance consult engine manufacturer's schedule.

3.2 Standard Options

Standard CZAW options:

- Nosewheel or tailwheel undercarriage
- Use of CH601XL type engine cowlings with either propshaft extension as shown on drawing 6-EO-3CZ or 6-EO-4CZ depending on propeller type
- Optional wing tanks per drawing 6-WT-1 and 6-FT-1
- CZAW forward hinged canopy, drawings CF-1 and CF-14 refer.
- Hinged rather than 'hingeless' ailerons

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.

Zenair's newsletter 'Zenair News' provides advice on building and operating Zenairs of all kinds, but Zenair have not promulgated service bulletins as such.

3.4 Special Inspection Points

- Elimination of undue friction in rudder control system and nosewheel steering. In order for the rudder to self-centre in flight and for the aircraft to meet normal directional stability requirements, it is essential to avoid undue friction in the rudder controls. This involves attention to the lubrication of the system, avoiding over-tight fits and the correct setting up of the rudder cable tensions, which should be carried out with the aircraft jacked up so that the nosewheel is off the ground to simulate the flight case.
- Elimination of undue friction in the elevator control system. In order to achieve positive pitch stability is important to avoid undue friction in the elevator controls. This is achieved through proper attention to lubrication, avoiding over-tight fits and correct elevator cable tensions. Elevator cable tension may tend to vary slightly

with elevator position. Elevator cables which are slightly loose at extreme travel are preferable to rigging them so that they are excessively tight around the neutral position, causing additional control friction.

- The throttle spring on the carburettor must be adjusted so that the system does not have a strong tendency to spring to 'full throttle' when the throttle knob is released, or require a strong pull to keep it in the closed position.
- If Rotax engine fitted, Rotax 912 series installation checklist to be completed (apart from flight test section) as part of final inspections prior to applying for Permit to Fly.
- On the closely related CH601HD model, cracks have been found in service of the engine mount at its attachment to the firewall, in the mount itself under the engine and of the brackets behind the firewall which support the engine mount bolts. Inspect these areas regularly for any signs of cracks developing. See also MOD/162A/009 regarding the same problem.
- Corrosion problems have been reported in service with some airframes which had not been fully primed prior to assembly of the components. Inspect airframe for signs of corrosion developing and ensure that structural integrity has not been compromised. Treat any corrosion before it becomes widespread, if necessary by replacing corroded parts with new.
- Riveted sheet aluminium construction. Care is required in interpreting the drawings, the dimensioning being vague in some areas with a possibility of errors creeping in on such major features as the location of the firewall bulkhead. Anticipate later build stages and check dimensions/fit of parts carefully prior to bending, cutting or drilling.
- Widespread use is made of Avex rivets using riveting techniques specially developed by Zenair and NOT APPLICABLE to other types of aircraft including use of Avex blind countersunk rivets into non-countersunk holes, and solid rivets set using flat dolly on mushroom head. Zenair permit the use of non-radiused (sharp corner) aluminium angle extrusions for primary structure (contrary to normal aviation practise using radiused material) and inspectors should be vigilant for the appearance of cracks in such structure.
- Care must be taken to avoid warps in the wings - once the wing skins are 'drilled off', any warps are there for the duration. The build manual is not detailed regarding engine installation and inspectors should take care to check that standard UK practices have been followed with regard to engine installation, fuel system, etc. Refer to engine installation manual as appropriate. For UK-built examples, it is recommend that suitable corrosion protection of the aluminium airframe is used throughout, e.g. epoxy primer on aluminium parts and assembly compound where steel parts assembled to aluminium parts.
- Maintenance is typical of riveted aluminium airframes. The only reported snags are failure of plastic nosewheel hub and wear in undercarriage sliding bearings/alignment slots. Pay attention to simple metal-to-metal bearings in the control system, undercarriage, etc, to be kept well lubricated and checked in particular for signs of wear. Plastic nosewheels, if fitted, to be checked carefully for signs of overstress/failure of hub.

3.5 Operational Issues

The following Safety Spot articles are relevant to Zenair aircraft

Light Aviation issue November 2012 *Rudder bar failure*

Rudder bar on plans built example of type found to be constructed from an earlier version of drawings with thinner wall thickness.

Light Aviation issue October 2013 *Woodcomp varia propeller failure*

Incorrect reassembly of propeller allowed it to rotate around its pitch axis in flight and resulting oscillation caused propeller to fail.

3.6 Special Test Flying Issues

- Special check on directional and longitudinal stabilities/control circuit frictions.

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