

AIRWORTHINESS APPROVAL NOTE NO: 27832

APPLICANT: Flybuy Ultralights Limited
AIRCRAFT TYPE: Ikarus C42 FB80
REGISTRATION NO: G-CCNT CONSTRUCTOR'S NO: 0311-6585
OPERATOR: -
INSTALLER: -
DESIGN ORGANISATION: Flybuy Ultralights Limited
CERTIFICATE CATEGORY: Permit to Fly
MODIFICATION NO: -
MODIFICATION TITLE: **Type Approval of the Ikarus C42 FB 80 Microlight and Approval for the Issue of a Permit to Fly**

1. **Introduction**

The aircraft is largely designed and manufactured for Flybuy Ultralights by Comco Ikarus Gerätebau GmbH, based at Mengen Airport in Southern Germany. It is the natural successor to the Company's market leader, the C22, of which over 1200 examples have been built. To date over 310 examples of the C42 have been built and flown, including those powered by the 100 hp Rotax 912ULS.

The prototype C42 was first flown in 1995; the first production flight took place in Spring 1996. The lead aircraft has completed over 2400 hours.

The C42 has been accepted by the Popular Flying Association (PFA) as a kit built aeroplane. The Applicant has declared that there are no differences between the PFA accepted kit standard and the Type Approved version being approved by this AAN.

The Ikarus C42 FB 80 with a Rotax 912UL engine is approved by this AAN 27832 and the Ikarus C42 FB 100 with a Rotax 912ULS engine is approved by AAN 27832 Addendum 1.

2. **Aircraft Build Standard**

The Ikarus C42 is a single engine, side by side, two seat microlight aeroplane. It has a strutted high wing, with ailerons and simple flaps. Its tricycle undercarriage is fixed and incorporates shock absorption on all three wheels.

The C42 has optional power plants:

- (i) The Rotax 912UL horizontally opposed, 4 cylinder 4 stroke engine, with water cooled heads and oil and air cooled cylinders; it has a capacity of 1211 cc and develops 80hp at 5800 rpm. The power is delivered to the fixed pitch propeller via a gearbox having a ratio of 2.27:1.
- (ii) The Rotax 912ULS, with a similar configuration to the 912UL, but with a larger swept volume, higher compression ratio and developing 100 hp. Its gearbox has a ratio of 2.43:1.

The fuselage structure consists of a 165mm diameter alloy tube running from nose to tail, on which are mounted the engine, control system, seats, undercarriage and tail empennage. Wings are of conventional ladder construction with leading and trailing edge aluminium tubes connected by compression struts and braced internally by wires. Each wing half is covered by reinforced polyester fabric, fabricated as a sock, then heat shrunk into position.

The Build Standard of the aeroplane is defined on the Build Standard Sheet which is contained in Flybuy Ultralight Procedure P.01, "Control and Storage of Drawings, Configuration Control". The initial production standard of the type is Build Standard 1 which is contained in Issue 2 of Procedure P.01.

The aeroplane may be fitted with one of two alternative propellers which are defined in the Type Approval Data Sheet (TADS), BM-68 at Issue 2. G-CCNT is fitted with an Arplast Ecoprop 170R 110/3 3 blade propeller.

The aeroplane may also be fitted with one or more optional modifications which are also defined in the TADS, BM-68 at Issue 2. G-CCNT has no optional modifications fitted.

3. Approval Procedures

This aircraft approval has been carried out in accordance with BCAR Section A Chapter A3-7.

4. Basis Of Approval

4.1 CAA Approval Basis For The Aircraft

The basis of approval of the Ikarus C42 FB 80 aeroplane is BCAR Section S, Issue 2 dated August 1999.

4.2 CAA Design Requirements For Permit to Fly

Any installed equipment for which the Air Navigation Order requires approval must be approved by the CAA.

4.3 Environmental Requirements

The applicable Noise certification standards are BCAR Section N, Issue 5, Chapter N3-6 for two seat microlight aeroplanes.

4.4 Design Requirements Associated With Operational Approvals

Not applicable.

5. Compliance With The Basis Of Approval

5.1 Compliance With The Approval Basis For The Aircraft

The compliance check list and associated test reports and analyses apply to the Ikarus C42 FB 100, 100 hp 912ULS version since this installation, with its higher speeds, imposes greater loads on all parts of the airframe. All claims made for this version of the aircraft are also valid for the Ikarus C42 FB 80 80 hp model.

a. Design reports/drawings/data

The reports referenced in the Compliance Check List Response reference CCR/C42/001 Issue 8 dated 5 October 2003 are acceptable to the CAA.

b. Ground/rig test reports

The reports referenced in the Compliance Check List Response reference CCR/C42/001 Issue 8 dated 5 October 2003 are acceptable to the CAA.

c. Flight Testing to demonstrate compliance

The reports referenced in the Compliance Check List Response reference CCR/C42/001 Issue 8 dated 5 October 2003 are acceptable to the CAA. The CAA conducted a familiarisation flight test on a PFA standard aeroplane on 30th April 2003, Flight Test Report FTR 11966S refers. The stability, handling and performance characteristics were found to meet the requirements of BCAR Section S.

d. Compliance Checklist.

The Compliance Check List Response reference CCR/C42/001 Issue 8 dated 5 October 2003 contains some declarations of partial compliance with BCAR Section S requirements which are discussed below.

S 993(e) In common with all Rotax 912 engine installations leakage from ruptured fuel lines could impinge on the exhaust. Tests have shown that fuel ignition is unlikely in these circumstances and the installation is acceptable on that basis.

S 1121(b) Although some parts of the exhaust system are located where flammable fluids may impinge on it, tests have indicated that the surface temperature is not hot enough to ignite the fluid and the installation is accepted on that basis.

The Compliance Check List Response also contains a declaration of partial compliance with Interpretative Material in BCAR Section S which is discussed below.

S 1307(a) The lap strap of the safety harness makes an angle of approximately 30° with the horizontal compared to a recommended range of 45 - 55°. This is acceptable to the CAA.

- e. Evidence of engine/propeller approval.

Powerplant and propeller approvals are carried out as part of the aircraft approval.

5.2 Compliance With Design Requirements For Permit to Fly

Not applicable

5.3 Compliance with Environmental Requirements

Noise Type Certificate No. 179M Issue 3 includes this aircraft type.

5.4 Compliance with Design Requirements Associated With Operational Approvals

Not applicable.

5.5 Required Manuals And Other Documents Including Mandatory Placards

- a. Flight Manual

C42 Owner's Manual reference OHB/C42/001 Issue 1 or later revision.

- b. Placards - Actual text, or reference to drawings of placards

See C42 Owner's Manual.

Placarding must include a warning that the aircraft is not certificated to an international standard.

- c. Maintenance Manual

C42 Owner's Manual reference OHB/C42/001 Issue 1 or later revision.

- d. Weight and Balance Schedule.

See C42 Owner's Manual for permitted cockpit loads and for Weight and Balance Record.

- e. Type Approval Data Sheet

Type Approval Data Sheet BM-68 Issue 2 refers.

6. **Conditions Affecting This Approval**

6.1 Aerobatic Limitations

Aerobatic manoeuvres are prohibited
Intentional spinning is prohibited
Load factor limitations: +4g / -2g

6.2 Loading Limitations

Maximum Total Weight Authorised:	450 kg
Maximum Empty Weight	268 kg
Minimum Cockpit Load	55 kg
Maximum Cockpit Load	172 kg
CG range limits:	350 mm to 560 mm aft of the datum point which is the wing leading edge.

6.3 Engine Limitations

Maximum take-off (max. 5 minutes)	5800 rpm
Max. continuous	5500 rpm
Max. CHT	150°C
Min. oil temp.	50°C
Max. oil temp.	140°C
Min. oil pressure	2 bar
Max. oil pressure	5 bar

6.4 Air Speed Limitations

Maximum indicated air speed	139 mph (121 knots) IAS
Maximum manoeuvring air speed	94 mph (82 knots) IAS
Maximum indicated air speed flaps extended	72 mph (63 knots) IAS

6.5 Other Limitations

The aircraft shall be flown by day in visual meteorological conditions only.

The aircraft is approved for operation with a maximum of two occupants

7. Continued Airworthiness

See C42 Owner's Manual reference OHB/C42/001 Issue 1 or later revision.

Owner's Service Bulletin OSB 16 has been issued by Flybuy Ultralights Ltd and is applicable to this aircraft. Compliance must therefore be shown with this OSB.

8. Survey

This aircraft G-CCNT being the first of the type to be registered in the UK has been surveyed by the CAA.

In the particular areas examined during the survey the aircraft was found to conform with the standard recorded by this AAN.

9. Issue of Permit to Fly

The following actions must be completed prior to issue of the Permit to Fly:

- a. All actions and ground test procedures specified by the aircraft manufacturer must be completed satisfactorily.
- b. Flight test procedure specified by the aircraft manufacturer must be completed to the satisfaction of the CAA.
- c. It must be verified that the documents or amendments to documents, and the placards defined under Section 5.5 above are as specified, including any changes specified under Section 8 above.

10. Approval

Subject to the conditions of Section 6 above, this aircraft, and any other of the same type completed to the same build standard, is approved for the issue of a Permit to Fly, provided that it is operated in accordance with the limitations specified/referenced and that it conforms with the contents of this AAN.

N J Davis

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For the Civil Aviation Authority

Date 23 December 2003