EUROSTAR
Pilot's Operating Manual

Addendum including CAA Type Approval

PILOT'S OPERATING HANDBOOK FOR MICROLIGHT AEROPLANE

EV-97 teamEurostar UK

Model: .....

Registration: .....

Serial No. .....

Approved by: .....

This aeroplane must be operated in compliance with the information and limitations contained herein.

This POH must be available on board the aeroplane.

WARNING

This aeroplane is not fitted with a certified engine. A power failure can occur at any time. Never fly over any area on to which a safe landing cannot be made in the event of an engine failure.

Amendment Record

Issue	Details of Change	Date	Authorised
1	Initial issue	14/07/03	
2	Addition of optional hourmeter and warning lamp – P37	16/8/04	

Table of Contents

SECTION 1 – GENERAL INFORMATION AND TECHNICAL DATA

1.1 Introduction

This Pilot's Operating Handbook has been prepared to provide pilots and instructors with information for the safe and efficient operation of the EV-97 teamEUROSTAR UK microlight aeroplane. It also contains supplemental data which may be found useful.

1.2 Certification basis

The EV-97 teamEUROSTAR UK has been approved by UK Civil Aviation Authority against the requirements of BCAR section S.

1.3 Warnings, cautions and notes

The following definitions apply to warnings, cautions and notes in the flight manual:

WARNING
Means that the non-observation of the corresponding procedure leads to an immediate or significant degradation of the flight safety.

CAUTION
Means that the non-observation of the corresponding procedure leads to a minor or possible long term degradation of the flight safety.

NOTE
Draws attention to any special item not directly related to safety, but which is important or unusual.

1.4 Descriptive Data

1.4.1 Aircraft description

EV-97 teamEurostar UK is an aircraft intended for recreational and touring flying and is limited to non-aerobatic operations in Visual Meteorological Conditions(VMC). It is a single engine, all metal, low-wing monoplane of semi-monocoque construction with two side-by-side seats. The aeroplane is equipped with a fixed tricycle undercarriage with a steerable nose wheel.

The powerplant is a ROTAX 912 (80 hp), four cylinder, four stroke engine driving a two blade V230C, fixed wooden propeller (standard propeller). An alternative GT 166 x 145 fixed pitch wooden propeller may also be fitted. The engine is fitted with a gearbox having a reduction ratio of 2.27:1.

1.4.2 Technical Data

Wing

Span	8.1	m	*26.57*	*ft*
Area	9.84	m^2	*105.92*	*ft^2*
Mean Aerodynamic Centre (MAC)	1.25	m	*4.10*	*ft*
Wing Loading	45.7	kg/m^2	*9.37*	*lb/ft^2*
Aileron area	0.21	m^2	2.26	ft^2
Flap area	0.52	m^2	*5.60*	*ft^2*

Fuselage

Length	5.98	m	*19.62*	*ft*
Width	1.04	m	*3.41*	*ft*
Height	2.34	m	*7.67*	*ft*

Horizontal tail unit

Span	2.5	m	*8.20*	*ft*
Area	1.95	m^2	*20.99*	*ft^2*
Elevator area	0.8	m^2	*8.60*	*ft^2*

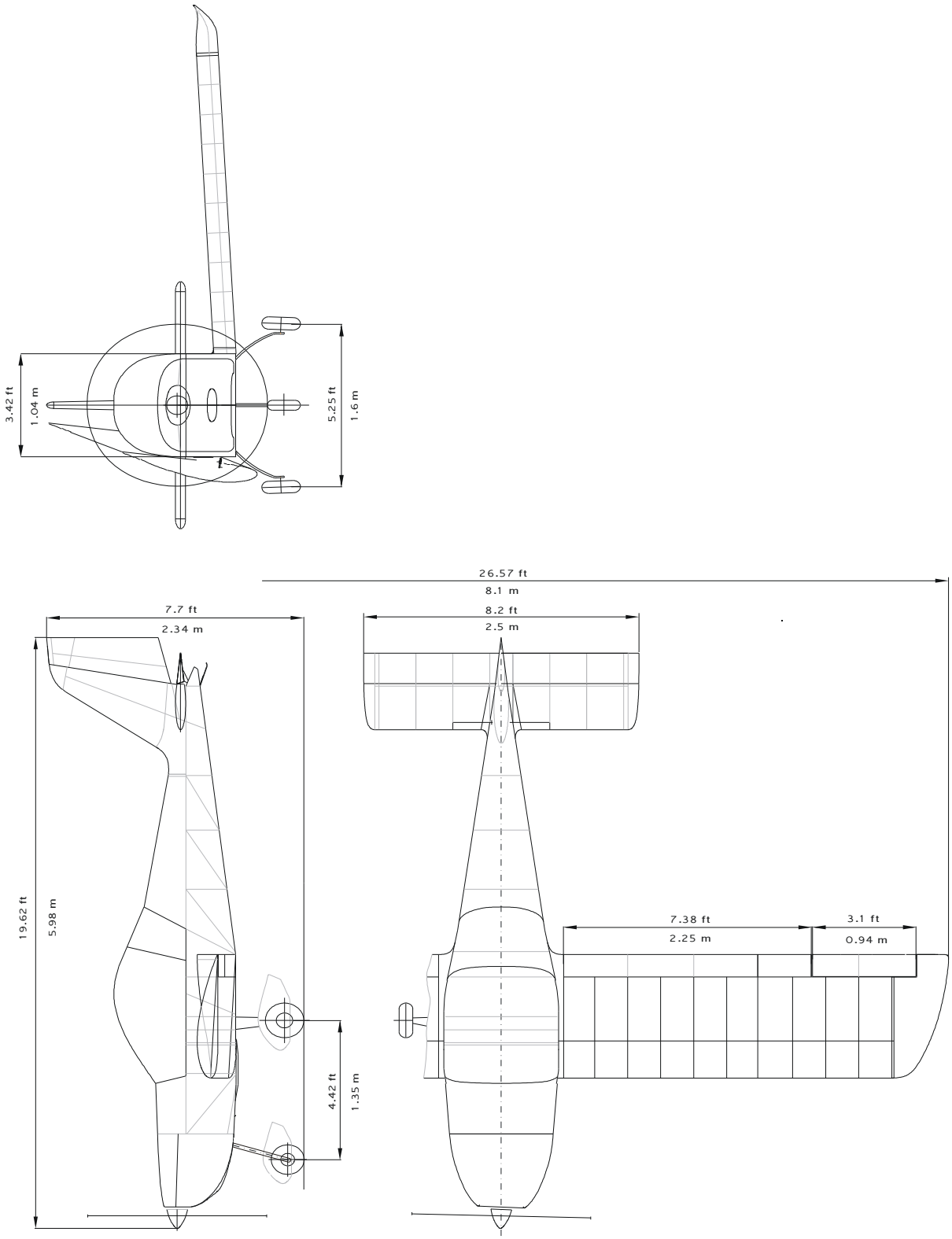
Vertical tail unit

Height	1.24	m	*4.07*	*ft*
Area	1.0	m^2	*10.76*	*ft^2*
Rudder area	0.4	m^2	*4.30*	*ft^2*

Landing gear

Wheel track	1.6	m	*5.25*	*ft*
Wheel base	1.35	m	*4.42*	*ft*
Main wheel diameter	350	mm	*14*	*in*
Nose wheel diameter	350	mm	*14*	*in*

1.4.3 Three-view drawing



SECTION 2 - LIMITATIONS

2.1 Introduction

Section 2 includes operating limitations, instrument markings and basic placards necessary for the safe operation of the aircraft, its engine, standard systems and standard equipment.

2.2 Airspeed

Airspeed limitations and their operational significances are shown below:

Speed		IAS mph	Remarks
V_{NE}	Never exceed speed	146	Do not exceed this speed in any operation.
V_A	Manoeuvring speed	100	Do not make full or abrupt control movement above this speed, because under certain conditions the aircraft may be overstressed by full control movement.
V_{NO}	Maximum structural cruising speed	118	Do not exceed this speed except in smooth air, and then only with caution.
V_{FE}	Maximum Flap. Extending speed	77	Do not exceed this speed with flaps extended.

2.3 Airspeed indicator markings

Airspeed indicator markings and their colour-code significances are shown below:

Marking	**IAS value or range** mph	**Significance**
White arc	40 – 77	Positive Flap Operating Range.
Green arc	49 – 118	Normal Operating Range.
Yellow arc	118 – 146	Manoeuvres must be conducted with caution and only in smooth air.
Red line	146	Maximum speed for all operations.

The lower end of the white arc is 1.1 V_{SO}
The lower end of the green arc is 1.1 V_{S1}

2.4 Powerplant

Engine Model:		ROTAX 912 UL	
Engine Manufacturer:		Bombardier-Rotax GMBH	
Power	Max Take-off:	59.6 kW / 80 hp at 5800 rpm, max.5 minutes	
	Max. Continuous:	56 kW / 75 hp at 5200 rpm	
	Cruising:	53 kW / 71 hp at 4800 rpm	
Engine speed	Max. Take-off:	5800 rpm, max. 5 min.	
	Max. Continuous:	5200 rpm	
	Cruising:	4800 rpm	
	Idling:	~1400 rpm	
Cylinder head temp.	Minimum	60 °C	140 °F
	Maximum	150 °C	302 °F
Oil temp.	Minimum	50 °C	122 °F
	Maximum	140 °C	284 °F
	Optimum	90 – 110 °C	194 - 230°F
Oil pressure	Maximum	7,0 bar	
	Minimum:	1,5 bar	
	Optimum:	1,5-4,0 bar	
Fuel:		see 2.13	
Fuel Pressure		min. 0.15 bar, max. 0.4 bar	
Oil:		Automotive engine oil of registered brand with gear additives, but not aircraft oil (refer to engine Operator´s Manual). API classification SF or SG.	
Propellers and Manufacturers		V 230C VZLÚ Praha, Czech Republic	GT-2/166/VSR FW101 SRTC GT Propellers Riccione Italy
Types:		Two blade fixed wooden propeller	Two blade fixed wooden propeller
Propeller diameters:		1625 mm	1660 mm
Propeller pitches:		18°20´ - 18°55´	1450 mm

WARNING

The Rotax 912 UL has not been certified as an aircraft engine and its failure may occur at any time. The pilot is fully responsible for consequences of such a failure. Never fly over an area on to which you cannot safely land in the event of an engine failure.

2.5 Powerplant Instrument Markings

Analogue powerplant instruments are installed in the EV-97 teamEurostar UK aeroplane, with the following markings:

	Minimum Limit	Normal Operating	Caution Range	Maximum Range
Engine speed (RPM)	1400	1400-5200	5200-5800	5800

Cylinder Head Temperature (CHT)	60 °C, *140 °F*	60-100 °C *140-212 °F*	100-150 °C *212-302 °F*	150 °C *302 °F*
Oil Temperature	50 °C *122 °F*	90-110 °C *194-230 °F*	50-90 °C, *122-194 °F* 110-140 °C, *230-284 °F*	140 °C *284 °F*
Oil Pressure	1.5 bar	1.5 - 4.0 bar	4.0 - 5.0 bar	7.0 bar cold engine starting
Fuel Pressure	0.15 bar	0.2 – 0.3 bar	0.3 – 0.4 bar	0.4 bar

2.6 Miscellaneous instrument markings

- Fuel gauge

A fuel reserve of 11 litres (*2.42 Imp. gals*) is indicated by yellow warning lamp.

2.7 Weight

Empty weight (standard equipment) max. 268 kg *591 lbs*

NOTE Actual empty weight is stated in SECTION 6, par. 6.2

Max. take-off weight 450kg *992 lbs*
Max landing weight 450kg *992 lbs*
Max. weight of fuel 47kg *104 lbs*
Max. baggage weight 15kg *33 lbs*

2.8 Centre of Gravity

Empty aircraft C.G. position (standard) 18±2% MAC = 200 – 250 mm AOD
Operating C.G. range 20-34% MAC = 250 – 425 mm AOD
Datum is wing leading edge.

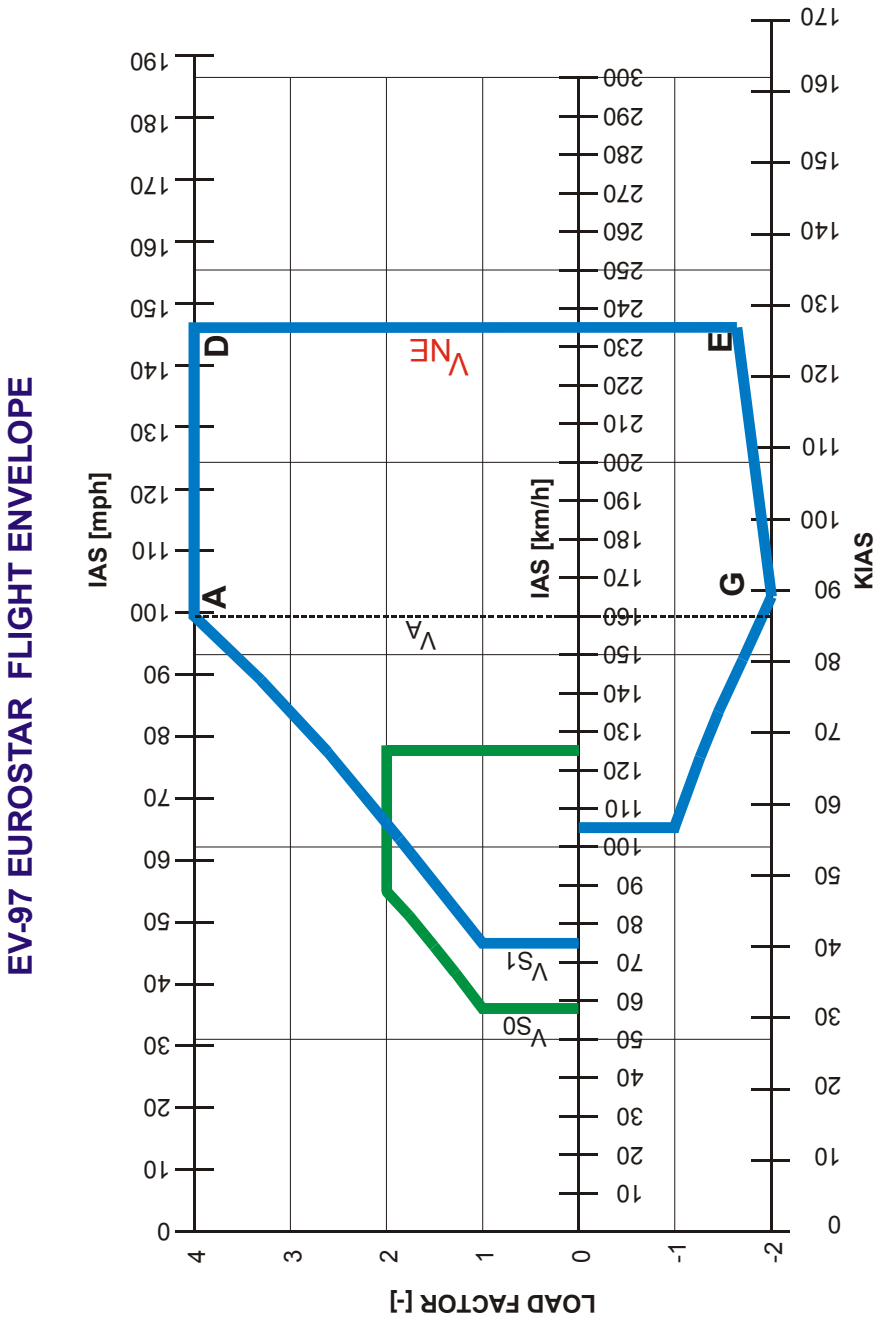
2.9 *Approved manoeuvres*

Aeroplane Category: Normal; the ***EV-97 teamEurostar UK*** aeroplane is approved for normal and below listed manoeuvres:

- Steep turns not exceeding 60° bank
- Lazy eights
- Chandelles
- Stalls (except whip stalls)

WARNING Aerobatics and intentional spins are prohibited !

2.10 *Manoeuvring Load Factor*



2.11 Crew

Minimum Crew	1
Minimum Crew Weight	55 kg, 121 lb
Maximum Crew Weight	see 6.2

WARNING
Always comply with the maximum take-off weight of 450 kg (992 lbs)

2.12 Kind of Operations

Daytime VFR flights only.

WARNING
IFR flights and flights under icing conditions are prohibited.

Minimum instruments required for VFR flights:

(i) Airspeed indicator, marked in accordance with 2.3
(ii) Altimeter
(iii) Magnetic compass
(iv) Slip ball

2.13 Fuel

- Regular or premium unleaded automobile fuel to EN228, minimum RON 90.

- AVGAS 100LL. The higher lead content in AVGAS can result in wear of valve seats and increased combustion chamber deposits. Use AVGAS only if other fuels are not available.

- For other suitable fuel types, refer to the engine Operator's Manual.

Fuel tank volume	65 litres	14.3 Imp. gals.
Unusable fuel quantity	2.9 litres	0.64 Imp. gals.

2.14 Maximum Passenger Seating

Number of seats 2

2.15 Other Limitations

Smoking is not permitted on board.

2.16 Limitations Placards

The owner of this aeroplane is responsible for the readability of placards during the aircraft service life.

The following placards are located on the aeroplane:

In view of the pilot:

Flight limited to daytime VFR non-icing conditions. Aerobatics and intentional spinning are prohibited. This microlight aeroplane has not been approved to an internationally recognised airworthiness standard.

AIRSPEEDS (IAS)

V_{NE} (Never exceed speed)	146 mph
V_A (Maximum manoeuvring speed)	100 mph
V_{FE} (Flaps extended max. speed)	77 mph
V_S (Stall speed, flaps extended)	36 mph

ENGINE LIMITATIONS

Maximum take-off (max. 5 minutes)	5800 rpm
Max. continuous	5200 rpm
Idle	approx. 1400 rpm
Max. CHT	150ºC
Max. oil temp.	140ºC
Min. oil temp.	50ºC
Min. oil pressure	1.5 bar
Max. oil pressure	7.0 bar
Minimum fuel pressure	0.15 bar
Maximum fuel pressure	0.4 bar

FUEL and LOAD LIMITS
Capacity 65 litres
Unusable fuel 2.9 litres

Maximum take-off weight	**450 kg**
Max. empty weight	**268 kg**
Actual empty weight	**___ kg**
Max. baggage weight	**15 kg**
Minimum Cockpit Load	**55 kg**

Cockpit Load incl. Baggage (kg)	**Max. Fuel Load (litres)**
172 (maximum)	14
160	31
150	44
140	58
135 or less	Full fuel

NOTE
The values stated on the above placard, FUEL and LOAD LIMITS, are valid for the maximum permitted empty weight of the aircraft. If the empty weight is less than the maximum of 268 kg, a customised placard may be used for revised load limits.

CG Limits

Operating C.G. range: 250 – 425 mm AOD

Datum is wing leading edge.

In the baggage area:

BAGGAGE
MAX.
15 kg

In view of both occupants:

NO SMOKING

Adjacent to the fuel filler:

90 RON minimum MOGAS unleaded to EN 228;
or AVGAS 100LL*
Prolonged use of AVGAS 100LL should be avoided.

SECTION 3 - EMERGENCIES

3.1 Introduction

Section 3 provides checklists and detailed procedures for coping with various emergencies that may occur. Emergencies caused by aircraft or engine malfunction are extremely rare if proper pre-flight inspections and maintenance are practiced.

However, should an emergency arise, the basic guidelines described in this section should be considered and applied as necessary to correct the problem. It is normally impractical to refer to this manual after the emergency has arisen; for this reason, pilots are strongly advised to familiarise themselves with its contents before flight.

3.2 Engine failure

Engine failure during take-off run:

1. Throttle - decrease to idle
2. Ignition - switch off
3. Brake - firmly as required

Engine failure during take-off:

1. Speed - glide at 68 mph.
2. Altitude - below 160 ft (*50 m*): land in take-off direction.
   - over 160 ft (*50 m*): choose landing area.
3. Wind - find direction and velocity.
4. Landing area - choose free area without obstacles; check for cables.
5. Flaps - extend as needed.
6. Fuel cock - shut off.
7. Ignition - switch off.
8. Propeller - set to the horizontal position by means of starter.
9. Safety harness - tighten.
10. Master switch - switch off before landing.

NOTE
Skip 6-10 if necessary. In an emergency, the pilot's priority is to land safely.

Engine failure in flight:

1. Speed - glide at 68 mph
2. Altitude - below 160 ft (*50 m*): land in flight direction
   - over 160 ft (*50 m*): choose landing area
3. Wind - evaluate direction and velocity
4. Landing area - choose free area without obstacles
5. Flaps - extend if necessary
6. Fuel cock - shut off
7. Ignition - switch off
8. Propeller - set to the horizontal position by means of starter
9. Safety harness - tighten
10. Master switch - switch off before landing
11. Land

3.3 In-Flight start

1. Speed - glide at 68 mph
2. Altitude - check
3. Landing area - choose according to altitude
4. Master switch - switch on
5. Fuel cock - open
6. Choke - as necessary (for cold engine)
7. Throttle - set 1/3 open
8. Ignition - switch on
9. Starter - push button to start the engine

If the engine cannot be started due to a flat battery, and there is adequate height, increase the flight speed to 124 mph so that air flow can rotate the propeller, thus enabling the engine to start.

WARNING
The loss of altitude during in-flight engine starting is about 1300 ft and must be taken into consideration.

3.4 Smoke and fire

3.4.1 Fire on the ground:

1. Fuel cock - shut off
2. Throttle - fully open
3. Master switch - switch off
4. Ignition - switch off
5. Abandon the aeroplane

Extinguish fire if possible, or call the fire-brigade.

3.4.2 Fire during take-off roll:

1. Abort take-off - brake hard
2. Master switch - switch off
3. Fuel cock - shut off
4. Throttle - fully open until fire stops or engine stops.
5. Ignition - switch off
6. Abandon the aeroplane

Extinguish fire if possible, or call the fire-brigade.

3.4.3 Fire during take-off (climb out):

1. Fuel cock - shut off
2. Throttle - fully open
3. Speed - 62-68 mph
4. Master switch - switch off
5. Ignition - switch off
6. Land and brake
7. Abandon the aeroplane

Extinguish fire if possible, or call the fire-brigade.

3.4.4 Fire in flight:

1. Fuel cock - shut off
2. Throttle - fully open to use excess fuel.
3. Master switch - switch off
4. Ignition - switch off after using up fuel in carburettors and engine stops.
5. Choose an emergency landing area.
6. Make emergency landing in accordance with 3.5 below.
7. Abandon the aeroplane

Extinguish fire if possible or call the fire-brigade.

NOTE
Estimated time to pump fuel out of carburettors is 30 seconds.

3.5 Glide

In the case of engine failure it is important to know and quickly establish the conditions for best glide:

1. Speed - ~68 mph
2. Flaps - retracted
3. Instruments - within permitted limits

3.6 Emergency Landings

Emergency landings are generally carried out in the case of engine failure where the engine cannot be re-started.

1. Best glide angle speed - 68 mph.
2. Trim - trim the aeroplane.
3. Safety harnesses - tighten.
4. Flaps - as needed.
5. MAYDAY - report your location if possible.
6. Fuel cock - shut off.
7. Ignition - switch off.
8. Master switch - switch off.

3.7 Precautionary landing

A precautionary landing is generally carried out in the cases where the pilot may be disorientated, the aircraft has no fuel reserve, or where bad weather or poor visibility present severe flight hazards.

1. Determine wind direction, choose landing area.
2. Make a PAN call on the radio and report your plan to land. Also state the landing area location.
3. Perform low-altitude passage into wind over the right-hand side of the chosen area with flaps extended to the “TAKE-OFF“ position at a speed of 68 mph to thoroughly inspect the area. Pay particular attention to electricity or telephone cables running across the landing area; these are often difficult to see.
4. Perform flight around the chosen area.
5. Perform an approach at increased idling with fully extended flaps.
6. Reduce power to idle when over the runway threshold and touch-down at the start of the chosen area.

7. After stopping the aeroplane switch off all switches, shut off the fuel cock, lock the aeroplane and look for help.

NOTE
Watch the chosen area permanently during precautionary landing.

3.8 Landing with a flat tyre

1. During the landing hold off, keep the damaged wheel above ground as long as possible using the ailerons.
2. Maintain direction during the landing roll using firm rudder pressure.

3.9 Landing with a defective landing gear

1. If the main landing gear is damaged, perform touch-down at the lowest speed possible and attempt to maintain direction during the landing roll.
2. If the nose wheel is damaged, perform touch-down at the lowest speed possible and hold the nose wheel over a runway using the elevator as long as possible.

3.10 Recovery from unintentional spin

WARNING
Intentional spins are prohibited! The procedure below is only for information.

The aircraft has no tendency to spontaneously enter an uncontrollable spin if normal piloting techniques are used.

The following standard procedure can be used to recover from an intentional spin:

1. Throttle - reduced to idle
2. Control stick - ailerons neutralised
3. Rudder pedals - full opposite rudder
4. Control stick - forward, elevator control as required to stop spin.
5. Rudder pedals - immediately after rotation stops, neutralise the rudder.
6. Recover from the dive, take care not to exceed $V_{NE.}$

3.11 Other emergencies

3.11.1 Vibration

If any forced aircraft vibrations appear:

1. Adjust the engine speed to the setting at which the vibration is minimum.
2. Land as soon as possible; perform a precautionary landing if necessary.

3.11.2 Carburettor icing

The EV-97 teamEurostar UK is fitted with a coolant carburettor heater system which should prevent carburettor icing; however icing may be possible under extreme conditions.

Certain weather conditions, particularly low temperatures and high humidity, give rise to the risk of carburettor icing. The carburettor icing shows itself through a decrease in engine power and an increase in engine temperatures.

To recover the engine power, the following procedure is recommended:

1. Speed - 68 mph
2. Throttle - set for 1/3 power
3. If possible, leave the icing area
4. Increase the engine power gradually to cruise conditions after 1-2 minutes.

If engine power cannot be recovered, make a precautionary landing, depending on the circumstances.

SECTION 4 – NORMAL OPERATIONS

4.1 Introduction

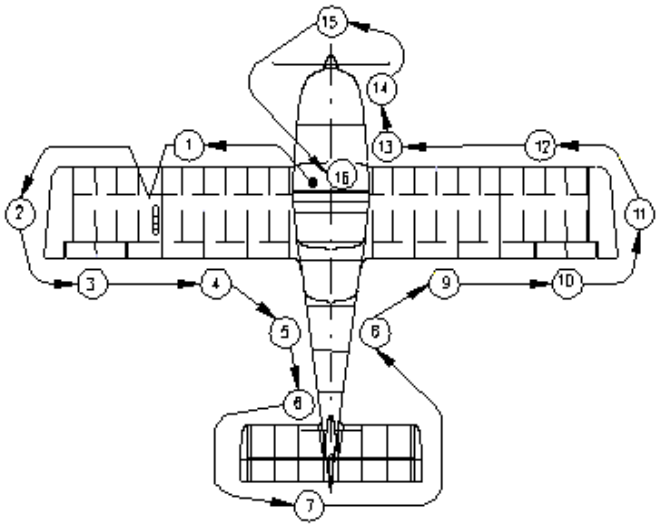
Section 4 provides checklists and detailed procedures for normal operations. Procedures for optional systems can be found in section 9.

4.2 Assembly and disassembly

For assembly and disassembly procedures refer to the Technical Description, Operating and Maintenance Manual for the Ultra-light Aeroplane ***EV-97 teamEUROSTAR UK.***

4.3 Pre-flight inspection

The pre-flight inspection is vitally important because incomplete or careless inspection could cause an accident. The following pre-flight inspection procedure is recommended by the aircraft manufacturer:



Check that the ignition is switched off in the cockpit.

1. *Wing*
   - Wing surfaces' condition, top and bottom.
   - Leading edge condition.
   - Pitot tube condition.

2. *Wing tip*
   - Surface condition.
   - Check of tips attachment.

3. *Aileron*
   - Surface condition, top and bottom.
   - Attachment.
   - Play.
   - Free movement.

4. *Flap*
   - Surface condition, top and bottom.
   - Attachment.
   - Play

5. Rear part of fuselage

- Surface condition, top and bottom.

6. Vertical tail unit

- Surface condition.
- Play in rudder hinge.
- Free rudder movement.

7. Horizontal tail unit

- Surface condition, top and bottom.
- Attachment.
- Play in elevator hinge.
- Free elevator movement.
- Trim tab condition.

8. see **5**

9. see **4**

10. see **3**

11. see **2**

12. see **1**

13. Landing gear

- Check main and nose landing gear attachment
- Check control of steerable nose wheel.
- Condition of tyres
- Condition and attachment of wheel spats

14. Engine

- Engine cowlings' condition
- Engine mount condition, inspect welded junctions for cracks.
- Engine attachment check
- Oil quantity check (between dipstick marks) *****

In cases where the engine has not been run for some time, oil can drain into the engine crankcase, making the oil tank level appear low. If the level does appear low, first ensure ignition is off, then turn the propeller until oil is heard to gurgle in the tank.

- Fuel and Electric system visual check
- Fuel system draining
- Other checks according to engine manufacturer instructions

CAUTION
It is advisable to turn the propeller by hand with the ignition switched off in the case where the engine has been out of operation for a long time. Avoid excessive pressure on a blade tip and trailing edge.

15. Propeller

- Propeller attachment
- Blades, Hub, Spinner condition
- Other checks according to propeller manufacturer instructions.

16. Cockpit

- Ignition - switched off
- Master switch - switched off
- Instruments - check condition
- Fuel gauge - check fuel quantity (switch Master ON, then OFF again).
- Controls - visual check
  - check correct function
  - check play
  - check flaps' extension
  - check full and free movement up to stops.
- Loose items - properly stowed and secured.
- Canopy - condition of attachment, cleanliness.

4.4 Normal procedures

4.4.1 Before entering cockpit

1. Aeroplane surface - check covers removed.
2. Cockpit - check items inside the cockpit stowed correctly.
3. Ignition - off.
4. Master switch - off.

4.4.2 After entering cockpit

1. Rudder pedals - free movement check.
2. Brakes - check function.
3. Control stick - check full and free movement.
4. Trim - check lever movement.
5. Flaps - check function.
6. Engine controls - throttle check friction set
7. Fuel cock - check turned on*

It is recommended that the fuel cock be left on at all times.

8. Fuel gauge - fuel quantity check
9. Master switch - off
10. Circuit breakers - off
11. Ignition - off
12. Instruments, radio - condition check
13. Safety harness - check of integrity
14. Cockpit - condition and canopy lock function

4.4.3 Engine starting

1. Fuel cock - check open.
2. Throttle - set for idle.
3. Check start up area - free of obstructions and people.
4. Master switch - on
5. Alternator switch - on.
6. Start - push start button for 5 secs with ignition off to pressurise oil system.
7. Ignition - switch on both switches.
8. Choke - pull on if engine is cold.
9. Starter - push the button to start engine.
10. After starting - slowly release choke and set throttle to idle.
11. Oil pressure - within 10 sec. min. pressure.
12. Engine warm-up - according to 4.4.4.

CAUTION

The starter should be activated for a maximum of 10 sec., followed by a 2 min. pause for starter motor cooling.
After starting the engine, adjust the throttle for smooth running between 2500-2750 rpm. Check the oil pressure, which should increase within 10 sec.
Increase the engine speed after the oil pressure has reached 2 bars (*29 psi*) and is steady.
To avoid shock loading, start the engine with the throttle set for idle or a maximum of 10 % opened, then wait 3 sec to reach constant engine speed before opening the throttle further.

4.4.4 Engine Warm-up and Check

Chock the main wheels before engine check. Initially warm up the engine at 2000 rpm for two minutes then continue to 2500-2750 rpm until the oil temperature reaches 50°C (*122 °F*). The warm up period depends on ambient air temperature.

Check both ignition circuits at 4000 rpm. The engine speed drop with either magneto switched off should not exceed 300 rpm. The maximum engine speed drop difference between circuits A and B should be 120 rpm.

Set max. power to check max. speed with given propeller; check engine temperatures and pressures.

Check pick up (acceleration) from idle to max. power. If necessary, cool the engine at 3000 rpm before shutdown.

CAUTION

The engine check should be performed with the aircraft heading upwind and not on loose terrain (the propeller may draw in debris which can damage the leading edges of the blades).

4.4.5 Taxiing

The recommended taxiing speed is 9 mph. The aeroplane can be steered either by the steerable nose wheel or by its brakes, or a combination of both. Hydraulic disc brakes are controlled by toe levers on the top of the rudder pedals.

4.4.6 Before take-off

1. Brakes - fully applied.
2. Rudder pedals - check full and free movement.
3. Control stick - check full and free movement.
4. Trim - neutral position.
5. Flaps - Take-off position.
6. Engine controls - choke shut (fully in).
7. Fuel cock - open.
8. Fuel gauge - fuel quantity check.
9. Instruments - within limits.
10. Radio (where fitted) -correct frequency, volume and squelch levels set.
11. Safety harness - secured and tightened.
12. Canopy - locked.

4.4.7 Take-off

By gradually increasing power, set the aircraft in motion.

The aeroplane can be steered by the nose wheel and/or by its hydraulic brakes. Slightly pull the stick back to take the load off the nose wheel. The aircraft takes-off at a speed above 47 mph. Slightly push the stick until the safety climb speed of 62 mph has been reached. The Maximum Flap Extended speed is 77 mph. Refer to para. 5.2.5 for optimum climbing speed.

WARNING

Take-off must be aborted if:

- The engine is running rough.
- The engine instruments' values are beyond operational limits.
- The engine choke is open
- The crosswind velocity exceeds permitted limits.

4.4.8 Climb

1.	Throttle	- Max. take-off power (max. 5 min.) 5800 rpm.
		- Max. continuous power (5200 rpm).
2.	Climb Speed	- 72 mph.
3.	Trim	- adjust.
4.	Instruments	- CHT, oil temp. and pressure within limits.

CAUTION

If the cylinder head temperature or oil temperature exceeds its limit, reduce the climb angle to increase airspeed.

4.4.9 Cruise

The ***EV-97 teamEurostar UK*** flight characteristics are very forgiving within permitted limits of airspeeds, configurations and CG range. The aircraft is very easy to both control and manoeuvre. For more details about horizontal flight regimes, refer to the Section 5.

4.4.10 Descent

1.	Throttle	- idle.
2.	Speed	- 68 mph.
3.	Trim	- as necessary.
4.	Instruments	- within limits.

CAUTION

On final approach and when descending from very high altitude, it is not advisable to reduce the throttle control to minimum. In such cases the engine may become overcooled resulting in loss of power. When descending, apply increased idle so that the engine instrument readings are within the limits for normal use.

4.4.11 Check before landing

1.	Fuel	- fuel quantity check
2.	Safety harness	- tightened
3.	Brakes	- check function
4.	Trim	- adjust
5.	Landing area check	- correct runway or into wind - base leg area clear - runway area clear

4.4.12 On base leg

1.	Speed	- 68 mph.
2.	Flaps	- extend to take-off position (first notch)
3.	Trim	- adjust.
4.	Throttle	- as necessary.
5.	Instruments	- within limits

4.4.13 On final

1.	Speed	- 60mph.
2.	Flaps	- landing position (second or third notch as required).
3.	Trim	- adjust.
4.	Throttle	- as necessary.
5.	Instruments	- readings within limits.

4.4.14 Landing

Reduce airspeed during the float, so that the touch down speed is about 44 mph. Gradually pull back the stick after touch-down to hold the nose wheel up as long as possible. Push the control stick when the nose wheel touches the ground. The landing run can be shortened by braking.

4.4.15 Baulked landing

1.	Throttle	- full.
2.	Engine speed	- max.5800 rpm.
3.	Flaps	- set to the take-off position (first notch).
4.	Climb out	- at a minimum speed of 62 mph.
5.	Trim	- as necessary.
6.	Flaps	- retract at a height of 200 ft.
7.	Trim	- adjust.
8.	Instruments	- within limits.
9.	Climb	- at 68 mph.

4.4.16 After landing

1.	Engine speed	- set as necessary for taxiing.
2.	Flaps	- retracted and locked.
3.	Trim	- neutral position.

4.4.17 Engine shutdown

1.	Engine speed	- idle.
2.	Instruments	- engine instruments within limits.
3.	Radio + intercom	- switch off.
4.	Ignition	- switch off.
5.	Master switch	- switch off.
6.	Alternator master	- switch off.
7.	Fuel cock	- leave on.

CAUTION

Rapid engine cooling should be avoided. such cooling is most likely to occur during aircraft descent, taxiing, low engine rpm or at engine shutdown immediately after landing.

Under normal conditions the engine temperatures stabilise during descent and taxiing at values suitable for stopping the engine by switching the ignition off. If necessary, cool the engine at 2500 – 2750 rpm to stabilise the temperatures prior to engine shut down.

4.4.18 Flight in rain

When flying in the rain, no additional precautions are required. Aircraft handling and performance are not substantially changed.

The slide window on the cockpit canopy may be used to make the visibility better under bad weather conditions and heavy rain.

SECTION 5 - PERFORMANCE

5.1 Introduction

Section 5 provides approved data for airspeed calibration, stall speeds, take-off performance and additional information useful for operation of the aeroplane.

The data in the charts has been computed from actual flight tests with the aircraft and engine in good condition and using average piloting techniques.

If not stated otherwise, the performances given in this section are valid for the max. take-off weight and flight under ISA conditions.

5.2 Airspeed Indicator System Calibration.

	IAS (mph)	**CAS (mph)**
V_{SO}	36	40
	40	44
	45	49
	50	53
	55	58
	60	62
	65	67
	70	71
	75	76
V_{FE}	77	77
	80	80
	85	85
	90	89
	95	94
V_A	100	98
	105	103
	110	107
	115	112
V_{NO}	118	114
	120	116
	125	121
	130	125
	135	130
	140	134
	145	139
V_{NE}	146	140
	150	143
	155	148
	160	152
V_D	163	156

5.3 Stall Speeds

Stall type	Flap Setting	Power Setting (rpm)	Warning	Stall Speed	
				IAS (mph)	CAS (mph)
Wings level stall	Retracted	Idle	No distinctive warning	44	48
		5200		37	41
	Take-off	Idle	Aeroplane mushes, without pitching down.	42	45
		5200		34	39
	Landing, 1st notch	Idle		39	44
		5200		30	35
	Landing, 2nd notch	Idle		36	40
		5200		29	34
Turning flight	Retracted	Idle	Aeroplane is fully controllable. No excessive loss of altitude during recovery.	45	49
		5200		39	44
	Take-off	Idle		43	47
		5200		35	40
	Landing, 1st notch	Idle		40	44
		5200		32	37
	Landing, 2nd notch	Idle		37	42
		5200		31	36

5.4 Take-off performance

Take-off distances stated in the following table are valid at sea level and an ambient temperature of 15 °C (*59 °F*).

Runway Surface	Take-off run distance		Take-off distance over 50 ft (15 m) obstacle	
	[ft]	[m]	[ft]	[m]
CONCRETE	620	189	1195	364
SHORT GRASS	662	202	1280	390

CAUTION
The above short grass distances assume short, dry grass on flat, firm ground. Greater take-off distances must be assumed for conditions which differ from these in any way.

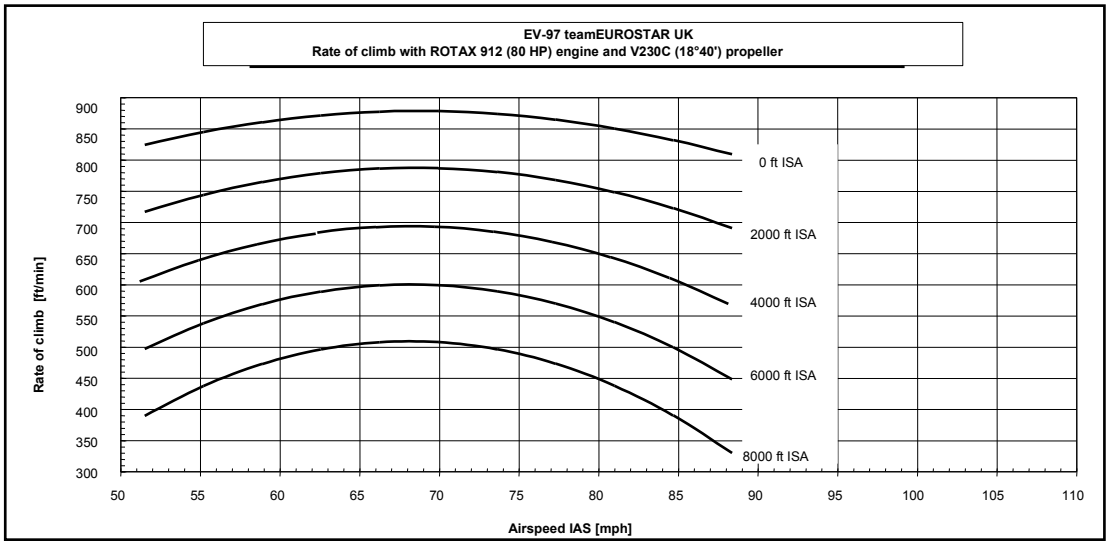
5.5 Landing distances

Landing distances stated in the following table are valid at sea level and ambient temperature of 15 °C (*59 °F*).

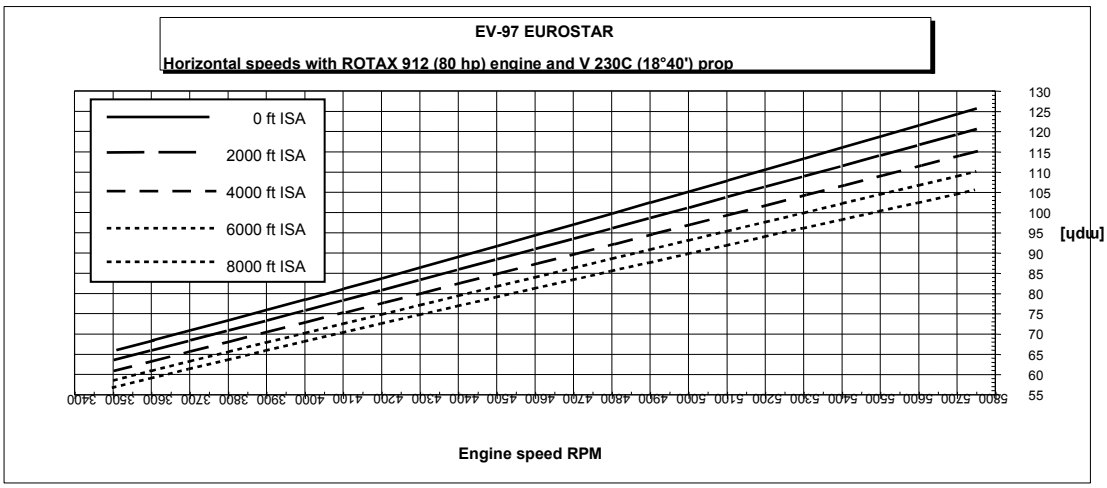
Runway surface	Landing distance over *50 ft* (15 m) obstacle		Landing run distance (braked)	
	[ft]	[m]	[ft]	[m]
CONCRETE	2218	676	896	273
SHORT GRASS	2132	650	853	260

CAUTION
The above short grass distances assume dry grass. Greater landing distances must be assumed for wet surfaces where braking effectiveness may be diminished.

5.6 Climb performance



5.7 Cruise



5.8 Horizontal Speeds

The following tables give indicated airspeeds (IAS) and corresponding True Air Speeds (TAS) versus altitude, for various engine speeds.

	4000 rpm	4200 rpm	4500 rpm	4800 rpm	5000 rpm	5200 rpm	5500 rpm	5750 rpm
8000 ft ISA	68 mph IAS	73 mph IAS	80 mph IAS	87 mph IAS	92 mph IAS	96 mph IAS	103 mph IAS	109 mph IAS
	68 mph CAS	72 mph CAS	79 mph CAS	85 mph CAS	90 mph CAS	94 mph CAS	100 mph CAS	105 mph CAS
	77 mph TAS	82 mph TAS	89 mph TAS	96 mph TAS	101 mph TAS	106 mph TAS	113 mph TAS	119 mph TAS
6000 ft ISA	71 mph IAS	76 mph IAS	83 mph IAS	91 mph IAS	96 mph IAS	101 mph IAS	109 mph IAS	115 mph IAS
	71 mph CAS	75 mph CAS	82 mph CAS	89 mph CAS	94 mph CAS	98 mph CAS	105 mph CAS	111mph CAS
	77 mph TAS	82 mph TAS	90 mph TAS	97 mph TAS	102 mph TAS	107 mph TAS	115 mph TAS	121 mph TAS
4000 ft ISA	74 mph IAS	79 mph IAS	87 mph IAS	95 mph IAS	100 mph IAS	106 mph IAS	114 mph IAS	120 mph IAS
	73 mph CAS	78 mph CAS	85 mph CAS	93 mph CAS	97 mph CAS	102 mph CAS	110 mph CAS	116 mph CAS
	78 mph TAS	83 mph TAS	91 mph TAS	98 mph TAS	103 mph TAS	109 mph TAS	116 mph TAS	123 mph TAS
2000 ft ISA	77 mph IAS	82 mph IAS	91 mph IAS	99 mph IAS	105 mph IAS	110 mph IAS	119 mph IAS	126 mph IAS
	76 mph CAS	81 mph CAS	89 mph CAS	96 mph CAS	101 mph CAS	106 mph CAS	114 mph CAS	121 mph CAS
	78 mph TAS	83 mph TAS	91 mph TAS	99 mph TAS	104 mph TAS	110 mph TAS	118 mph TAS	124 mph TAS
0 ft ISA	80 mph IAS	85 mph IAS	94 mph IAS	103 mph IAS	109 mph IAS	115 mph IAS	124 mph IAS	132 mph IAS
	79 mph CAS	84 mph CAS	92 mph CAS	100 mph CAS	105 mph CAS	111 mph CAS	119 mph CAS	126 mph CAS
	79 mph TAS	84 mph TAS	92 mph TAS	100 mph TAS	105 mph TAS	111 mph TAS	119 mph TAS	126 mph TAS

5.9 Endurance

The following table give fuel consumptions, endurances and ranges for specific engine speeds.

Fuel tank capacity 65 litres 14.3 Imp. gals.

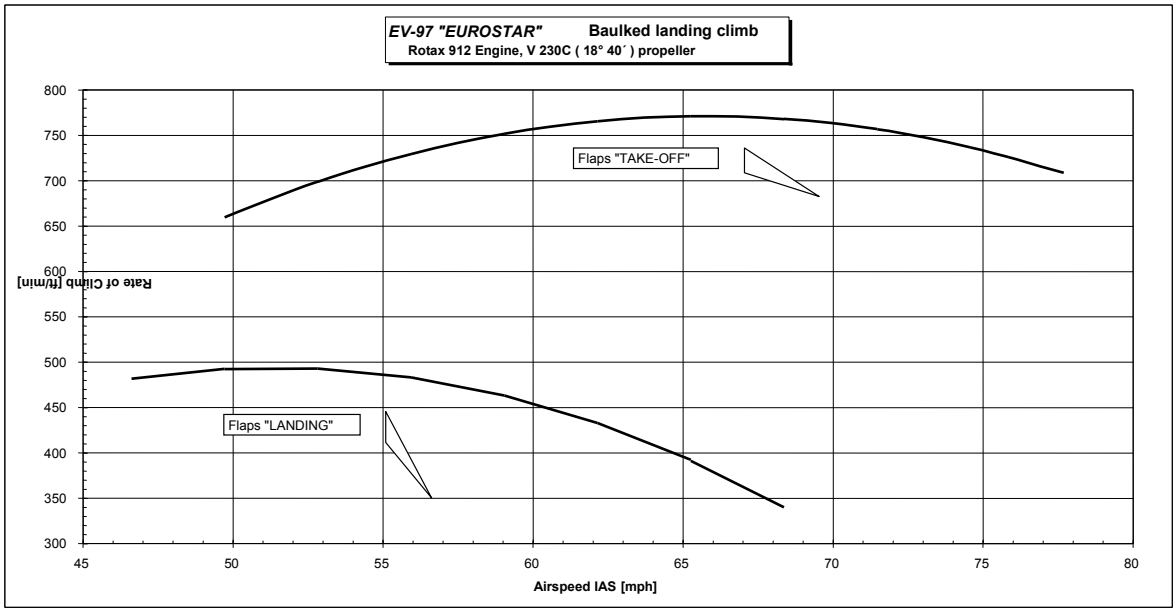
Fuel reserve * 11 litres 2.4 Imp. gals.

* Reserve is indicated by a yellow warning lamp on the dash.

At 2000 ft altitude ISA conditions:

Engine speed	rpm	4200	4500	4800	5000	5200	5500
Fuel consumption	l/hr	9	11	13	14	15	18
	Imp. gal/hr	2.0	2.4	2.9	3.1	3.3	4.0
IAS	mph	82	91	99	105	110	119
CAS	mph	81	89	96	101	106	114
Total endurance	hours	7.2	5.9	5.0	4.6	4.3	3.6
Total range	stat. miles	580	520	480	470	460	410
	naut. miles	510	450	420	410	400	360
Reserve endurance	hours	1.2	1.0	0.8	0.8	0.7	0.6
Reserve range	miles	100	90	80	80	80	70

5.10 Baulked landing climb



5.11 Environmental Effects on Flight Performance and Characteristics

Flight performance and handling are not substantially affected by rain or the accumulation of insects or moderate dirt on the aeroplane's surface.

Flight in heavy rain should be avoided as this can cause propeller damage from rain erosion. If such flight is unavoidable, reduce the engine speed to the minimum to sustain safe flight.

5.12 Demonstrated crosswind performance

Max. permitted cross wind velocity for take-off and landing	11 mph (10 kts)
Max. permitted head wind velocity for take-off and landing	27 mph (23 kts)

5.13 Ceiling

Service ceiling 16500 ft.

SECTION 6 – WEIGHT AND BALANCE

6.1 Introduction

This section details the payload range within which the aircraft G - _ _ _ _ may be safely operated.

6.2 Permitted Cockpit Loads

Whenever the empty weight changes following periodic weight checks, modification or repair, revised values for the Empty Weight must be entered in the table below. This table is specific to the aeroplane to which this POH applies.

Procedures for weighing the aircraft and the calculation method for establishing the permitted payload range are contained in the Maintenance Manual for the EV-97 teamEUROSTAR UK.

Maximum Permitted Crew Weight for given Baggage and Fuel Loads, kg.										
Date	**Empty weight kg**	**Empty CG posn. mm AOD**		**FUEL LOAD**					**Approved**	
				Fuel gauge	1	3/4	1/2	1/4	**Date**	**Signature**
				Fuel volume	62 litres	47litres	31 litres	15 litres		
				Fuel weight	45 kg	33kg	22 kg	11 kg		
			BAGGAGE	max. 15kg						
				½ = 8 kg						
				None						
				max. 15kg						
				½ = 8 kg						
				None						
				max. 15kg						
				½ = 8 kg						
				None						
				max. 15kg						
				½ = 8 kg						
				None						

SECTION 7 - AEROPLANE AND SYSTEMS DESCRIPTION

7.1 Introduction

This section describes the aircraft, its systems and their operation.

7.2 Airframe

The ***EV-97 teamEurostar UK*** airframe is a semi-monocoque construction, formed with metal reinforcements, bulkheads and Duralumin skins.

7.2.1 Fuselage

The fuselage cross-section is rectangular in the lower section and semi-elliptical in the upper section. The tail fin is an integral part of the fuselage. In the mid section of the fuselage there is a two-man cockpit which is accessible by raising the one-part Perspex overlap canopy. The engine section in the nose is separated from the crew by a firewall to which the engine mount is attached.

7.2.2 Wing

The rectangular wing is a monospar construction with an auxiliary (rear) spar for the aileron and flap attachments; all the elements are riveted together. Fibre glass wing tips are riveted to the ends of the wings.

7.2.3 Horizontal tail unit (HTU)

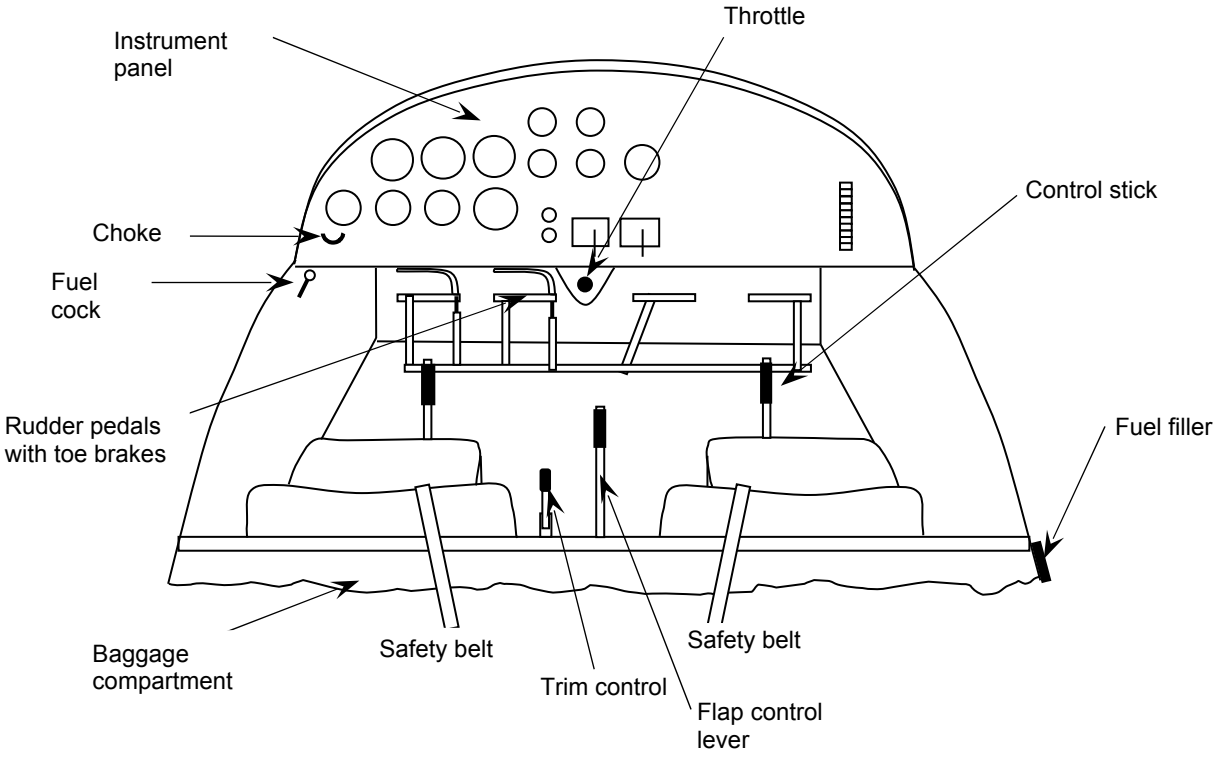
The rectangular HTU consists of a stabiliser and elevator with a trim tab. The semi-monocoque construction of the HTU consists of Duralumin ribs, spar and skins.

7.2.4 Vertical tail unit (VTU)

The trapezoidal fin section of the VTU is mounted to the rear section of the fuselage. The rudder is attached to the fin by two hinges. The frame of the VTU consists of a formed metal sheet spar and a Duralumin skin.

7.3 Cockpit Controls

Standard instruments and controls are shown below:



7.4 Landing gear

The aeroplane has a fixed landing gear with a steerable nose wheel. The main landing gear legs are compliant glass fibre providing good shock absorption. The wheels are fitted with 400-6 tyres and hydraulic disc brakes controlled by toe brake levers on the pilot's rudder pedals. The nose landing gear leg is a welded steel tube construction and its suspension is rubber rope.

The nose wheel steering system is connected directly to the rudder control.

7.5 Seats and safety belts

The aeroplane has two side-by-side seats which are fixed, (non-adjustable). Each seat is equipped with a four point safety belt attached to the fuselage at the side of each seat and the centre bulkhead behind the baggage compartment.

7.6 Baggage compartment

The baggage compartment is located behind the seats. Maximum baggage weight is stated on the placard located near the baggage compartment.

7.7 Canopy

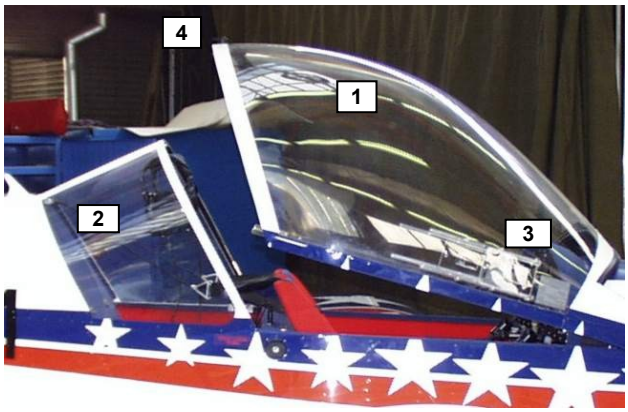
The semi drop-shaped canopy consists of a steel frame to which is bolted a Perspex (acrylic) transparency. The canopy is attached to the nose section of the fuselage by two horizontal hinge pins, permitting the canopy to be tilted forward; two gas struts counterbalance its weight to facilitate opening and closing. External handles are installed on the lower frame; the canopy is also equipped with a lock at the rear upper section of the frame.

4

Two-part cockpit canopy:

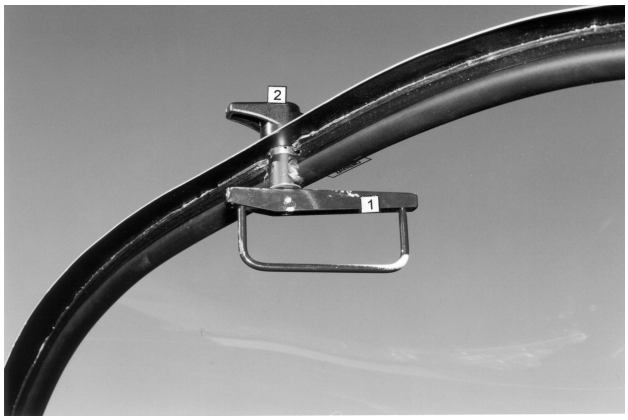
1. Front tilting canopy.
2. Rear, fixed canopy.
3. Side ventilation window.
4. Canopy lock.

2



Cockpit canopy lock:

1. Interior lever
2. External lever and lock.



7.8 Powerplant

The standard powerplant of the ***EV-97 teamEurostar UK*** is the ROTAX 912 UL (80 hp) engine. The Rotax 912 is 4-stroke, 4 cylinder horizontally opposed, spark ignition engine with one central camshaft-push-rod-OHV and the following features:

- Liquid cooled cylinder heads, ram-air cooled cylinders.
- Dry sump forced lubrication.
- Dual breakerless capacitor discharge ignition.

The engine is fitted with an electric starter, alternator and mechanical fuel pump. The propeller is driven via a reduction gear with integrated shock absorber.

A two blade, fixed pitch, wooden propeller V 230C is installed as standard on the ROTAX 912 UL engine; the GT-2 166 x 145 is an alternative propeller, (also two blade, fixed wooden).

7.9 Fuel system

The fuel system consists of a 65 litre (*14.3 Imp. gals*) tank, fuel cock, filter and mechanical fuel pump on the engine. The tank is positioned in a separate space behind the seats and has a drain sump and drain valve. The outlet is situated below the fuselage. A mechanical pressure gauge is installed in the instrument panel.

Fuel quantity is indicated by an electric float fuel gauge. The electric fuel gauge indicates the relative quantity of fuel in the tank (the corresponding quantity in litres is shown in table 6.2).

7.10 Electrical system

The aeroplane is equipped with a 12v DC electrical system; most services use frame return (-ve).

The engine does not require the aeroplane's DC system to function, except for starting. Its ignition system derives its power from an independent alternator built into the engine. Full details of the engine's electrical system can be found in the Rotax Operator's Manual.

A complete circuit diagram for the aeroplane is given in the Maintenance Manual.

DC Supply

A 10 amp.hour lead-acid sealed battery is installed on the firewall and receives charge from the engine's alternator via an electronic rectifier/regulator unit and a 25 amp fuse. The regulator is a switched mode unit and a large (22,000 µF) electrolytic capacitor is connected across its output to provide smoothing for avionics and other services sensitive to electrical noise. It also protects services from over-voltage in the event of battery disconnection.

A voltmeter mounted on the instrument panel monitors the battery voltage. Normal readings lie in the range 12 to 14.4 volts.

Distribution and Services

The battery is connected via a 25 amp fuse to a +ve busbar mounted behind the instrument panel, and switched by the Master Switch. The busbar feeds the following services via the fuses shown:

Oil temperature gauge CHT gauge Oil pressure indicator	1 amp
Tachometer	2 amp
Fuel gauge	1 amp
Voltmeter, Optional Hourmeter & Optional Hourmeter Warning Lamp	1 amp
Starter relay	10 amp
Panel socket 1	5 amp
Panel socket 2	5 amp
Spare	5 amp

Electric Starter System

The high starter motor current is switched by a relay mounted on the firewall. The starter relay is energised when the Master switch is ON and the starter button, mounted on the instrument panel, is depressed.

A warning lamp in the instrument panel, is connected to the starter relay secondary and warns if the starter relay remains closed after the starter button is released.

Fuel Gauge

A float fuel gauge is installed in the 65 litre tank. Its sensor provides a variable DC voltage to a meter mounted in the instrument panel. The meter shows FULL, ¾, ½, and 0 and is calibrated when the aeroplane is built.

7.11 Pitot and Static Pressure Systems

The pitot-static head, sensing dynamic and static air pressures, is located under the left half of the wing. Pressure is transmitted to individual instruments via flexible plastic hoses. The system must be kept clear to ensure that it functions properly.

The lowest parts of the pitot and static hoses lie on the left hand side of the cockpit, immediately in front of the seat. If water is visible in the hoses at these points, disconnect them and blow into the pitot static head to clear the water.

CAUTION
Avoid blowing into the pitot static system with the hoses connected to the instruments - this may cause instrument damage

SECTION 8 - AEROPLANE GROUND HANDLING AND MAINTENANCE.

8.1 Introduction

This section contains factory-recommended procedures for proper ground handling and servicing of the aeroplane. It also identifies certain inspection and maintenance requirements which must be followed if the aeroplane is to retain new-plane performance and dependability. It is wise to follow a planned schedule of lubrication and preventive maintenance based on climatic and flying conditions; this should be done according to the Maintenance Manual for the ***EV-97 teamEUROSTAR UK***.

8.2 Aircraft inspection periods

The frequency of checks and associated maintenance depends on operating conditions and the overall condition of the aeroplane. The manufacturer recommends that the minimum maintenance checks and periodic inspections be carried out as follows:

a) After the first 25 ± 2 flight hours.
b) After every 50 ± 3 flight hours thereafter.
c) After every 100 ± 5 flight hours or annually, whichever occurs sooner.

Every other annual inspection should be performed by the manufacturer.

Refer to the Rotax 912 Operator´s Manual for engine maintenance.

Maintain the prop according to its manual.

Refer to the Maintenance Manual for the ***EV-97 teamEurostar UK*** for more details about maintenance.

8.3 Aircraft alterations or repairs

It is essential that the responsible airworthiness authority and the aircraft manufacturer be contacted prior to any modifications to the aircraft to ensure that the airworthiness of the aircraft is not invalidated.

If the aircraft weight could be affected by a modification, the aeroplane must be re-weighed to record the new empty weight and cg. The Weight and Balance record / Permitted Payload range table given in Section 6.2 and the Load Limits placard must also be amended to reflect the change.

Refer to the Maintenance Manual for Ultra-light Aeroplane ***EV-97 teamEurostar UK*** for aeroplane repairs.

8.4 Ground handling / Road transport

8.4.1 Towing

It is easy to tow the aircraft a short distance by holding the prop blade at the root since the aeroplane's empty weight is low. The rear part of the fuselage in front of the fin, and the wing roots are suitable surfaces to hold the airframe .

CAUTION
Avoid excessive pressure at the aeroplane airframe - especially at the wing tips, elevator, rudder, trim etc.

CAUTION
Handle the propeller by holding the blade root - never blade tip! If starting the engine manually - always handle the propeller on a blade surface i.e. do not hold only an edge.

8.4.2 Parking and Tie-Down

It is advisable to keep the aeroplane inside a hangar, or other safe area, having a stable temperature, good ventilation, low humidity and a dust-free environment.

If the aeroplane is kept outside, it must be tethered to strong tie-down points, particularly if it is to be left for some time. The aeroplane is equipped with mooring eyes located on the lower surfaces of the wings.

Tie-Down Procedure:

1. Check: master, alternator, and ignition switches off.
2. Secure the control stick e.g. by means of the safety harness or tie the control stick to the rudder pedals by a suitable rope.
3. Shut all the ventilation windows.
4. Close and lock the cockpit.
5. Tie down the aircraft to the ground by a rope passed through the tie-down eyes located on the lower surfaces of the wing. It is also necessary to tie down the nose wheel landing gear and the tail skid to the ground.

When parking for a long time, it is recommended that the cockpit canopy, and possibly the whole aeroplane, be covered by a suitable cover. Take great care to ensure that:

- the internal surface of such covers are clean and cannot abrade the aeroplane's surface.
- the covers are pulled down taught to prevent wind induced flutter from damaging the surface; use additional straps where necessary.
- the aeroplane is parked into the prevailing wind, or in the most sheltered area available.

8.4.3 Jacking

Because the empty weight of this aircraft is relatively low, two people can lift the aircraft easily. First prepare two suitable supports for the fuselage. It is possible to lift the aircraft as follows:

- Push down on the rear part of the fuselage, just before the fin, to lift the front of the aircraft. Then support the weight under the firewall.
- To jack the rear part of the aircraft, handle the fuselage near the auxiliary tail skid, lift it upward and support it.
- To lift the wings, push from underneath the wings only at the main spar. Avoid lifting the wings by means of handling the wing tips.

8.4.4 Levelling

Refer to the Maintenance Manual for the ***EV-97 teamEurostar UK*** for more details about levelling.

8.4.5 Road transport

The aircraft may be transported by loading on to a suitable car trailer.

It is necessary to dismantle the wings before road transport. The aircraft and dismantled wings should be fastened down securely to protect these parts against possible damage.

8.5 Cleaning and care

Use efficient cleaning detergents to clean the aircraft surface. Oil spots on the aircraft surface (except the canopy!) may be cleaned with petrol.

Clean the canopy only by washing it with lukewarm water and detergent. Use either a soft clean cloth, sponge or chamois leather.

CAUTION
Never clean the canopy dry and <u>never</u> use petrol or chemical solvents!

Upholstery and covers can be removed from the cockpit, brushed, and if necessary, washed in lukewarm water with detergent. Dry the upholstery thoroughly before reinstalling into the cockpit.

NOTE
In the case of long term parking, cover the canopy to protect the cockpit interior from direct sunshine.

AIRWORTHINESS APPROVAL NOTE NO: 28662
APPLICANT: Cosmik Aviation Limited
AIRCRAFT TYPE: EV-97 teamEurostar UK
REGISTRATION NO: G-OCMT CONSTRUCTOR'S NO: 1701
OPERATOR: -
INSTALLER: -
DESIGN ORGANISATION: Cosmik Aviation Limited
CERTIFICATE CATEGORY: Permit to Fly
MODIFICATION NO: -
MODIFICATION TITLE: **Type Approval of the teamEurostar UK Microlight and Approval for the Issue of a Permit to Fly**

1. Introduction

This aeroplane is largely designed and manufactured for Cosmik Aviation by Evektor-Aerotechnik (EV-AT), based at Kunovice Airport in the Czech Republic. EVAT
is a commercial aircraft design and manufacturing company holding Czech Republic Civil Aviation Authority and ISO 9001 approvals, and the teamEurostar UK has been designed and built using the same resources and procedures (materials, design control, quality control, staff, design tools and test techniques) as its other products. The aeroplane is the natural successor to the company's P220 ultralight aeroplane and shares some of its design features. To date over 200 examples of the Eurostar variants have been built and flown, including those used as glider tugs and fitted with the 100 hp Rotax 912S. The prototype Eurostar was first flown in 1996; the first production flight took place in 1997. The lead aircraft has completed over 1500 hours to date. The EV-97 Eurostar was assessed against the requirements of BCAR Section S and accepted by the Popular Flying Association as a kit-built aeroplane in 2001. The EV-97 teamEurostar UK aeroplane differs in some minor respects from the EV-97 Eurostar PFA accepted variant.

2. Aircraft Build Standard

The teamEurostar UK aeroplane is a conventional configuration, single engine, all metal, low wing monoplane of semi-monocoque construction with two side by side seats. It has a single cantilevered wing, with ailerons and split flaps. Its tricycle undercarriage is fixed and incorporates shock absorption on all three wheels and disc brakes on the main wheels.

The aeroplane is powered by 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 a wooden two blade V230C or GT-2/166/145 fixed pitch propeller via a gearbox having a ratio of 2.27:1. The power plant is separated from the cockpit by a firewall to which the engine mount is attached.

The semi-monocoque fuselage structure is formed with aluminium alloy reinforcement members, bulkheads and an aluminium alloy skin; it has an integral fin. Solid and pop rivets are used for joints, together with a polyurethane bonding agent between the surfaces. Some non-structural parts of the airframe are moulded from fibre-reinforced plastic.

The cockpit is accessed by lifting the one-piece acrylic canopy, hinged at the front. The rear, fixed part of the canopy is Lexan (transparent polycarbonate). Occupants step on to the wing roots to reach the seats.

The Build Standard of the aeroplane is defined on the Build Standard Sheet which is contained in Cosmik Aviation Procedure P.01 "Control and Storage of Drawings". The initial production standard of the type is Build Standard 2 (BS02) which is contained in Issue 2 of Procedure P.01.

The minor differences between the PFA approved standard and this Type Approved standard are as follows:

 Coolant temperature gauge has been removed.
 Voltmeter has been repositioned.
 Provision for additional sockets incorporated on the instrument panel.
 Additional toe brakes fitted to right hand rudder pedals.
 Optional small changes to the style of the cowling.
 Fuel drain spring return
 Pitot static system water trap

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 EV-97 teamEurostar UK 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

a. Design reports/drawings/data

The reports referenced in the Compliance Check List Response reference CCR/EUR/001 Issue 1 dated 1st July 2003 are acceptable to the CAA.

b. Ground/rig test reports

The reports referenced in the Compliance Check List Response reference CCR/EUR/001 Issue 1 dated 1st July 2003 are acceptable to the CAA.

c. Flight Testing to demonstrate compliance

The reports referenced in the Compliance Check List Response reference CCR/EUR/001 Issue 1 dated 1st July 2003 are acceptable to the CAA. The CAA conducted a familiarisation flight test on a PFA standard aeroplane on 13th February 2003, Flight Test Report FTR 11914S refers. The stablilty, handling and performance characteristics were found to meet the requirements of BCAR Section S.

d. Compliance Checklist.

The Compliance Check List Response reference CCR/EUR/001 Issue 1 dated 1st July 2003 contains several declarations of partial and non compliances with BCAR Section S requirements which are discussed below.

S 473(c) Although testing has not been carried out it is accepted that an acceptable standard has been demonstrated.

S 561(b) It is accepted that compliance with JAR VLA561(b) is an acceptable standard.

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.
S 1307(a) The lap strap of the safety harness makes an angle of approximately 65º with the horizontal for a slim pilot compared to a recommended range of 45 - 55º. 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.
f. Engine mounts
Either of the engine mounts defined for this aircraft are approved to be fitted.

5.2 Compliance With Design Requirements For Permit to Fly

Not applicable.

5.3 Compliance with Environmental Requirements

Noise Type Certificate No. 175M Issue 2 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
EV-97 teamEurostar UK Pilot's Operating Handbook reference POH/EUR/01 Issue 1 or later revision.
b. Placards - Actual text, or reference to drawings of placards
See Pilot's Operating Handbook.
Placarding must include a warning that the aircraft is not certificated to an international standard.
5
c. Maintenance Manual
EV-97 teamEurostar UK Maintenance Manual reference GEN/EUR/02 Issue 1 or later revision.
d. Weight and Balance Schedule
See Pilot's Operating Handbook for permitted cockpit loads and Maintenance Manual for Weight and Balance Record.
e. Type Approval Data Sheet
Type Approval Data Sheet TADS BM-67 Issue 1 or later revision.

6. Conditions Affecting This Approval

Airworthiness Limitations for Permit to Fly:
8.1 Aerobatic Limitations
Aerobatic manoeuvres are prohibited
Intentional spinning is prohibited
Load factor limitations: +4g / -2g
8.2 Loading Limitations
Maximum Total Weight Authorised: 450 kg
Maximum Empty Weight 268 kg
Minimum Cockpit Load 55 kg
Maximum Cockpit Load 172 kg
Maximum Baggage Weight 15 kg
CG range limits: 250 mm to 425 mm aft of the datum point which is the wing leading edge.
8.3 Engine Limitations
Maximum take-off (max. 5 minutes) 5800 rpm
Max. continuous 5200 rpm
Idle approx. 1400 rpm
Max. CHT 150ºC
Max. oil temp. 140ºC
Min. oil temp. 50ºC
Min. oil pressure 1.5 bar

Max. oil pressure 7.0 bar
Minimum fuel pressure 0.15 bar
Maximum fuel pressure 0.4 bar
8.4 Air Speed Limitations
Maximum indicated air speed 146 mph IAS
Maximum manoeuvring air speed 100 mph IAS
Maximum indicated air speed flaps extended 77 mph IAS

8.5 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 Cosmik Aviation EV-97 teamEurostar UK Maintenance Manual reference GEN/EUR/02 Issue 1 or later revision.

8. Survey

This aircraft G-OCMT 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 initial issue of the Permit to Fly:
a. All actions and ground test procedures specified by the aircraft manufacturer must be completed satisfactorily.
b. 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.

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N J Davis
For the Civil Aviation Authority
Date 1st August 2003