

BRITISH MICROLIGHT AIRCRAFT ASSOCIATION  
HOMEBUILT AIRCRAFT DATA SHEET (HADS)

**NO: HM6 ISSUE: 3**

TYPE	Easy Raider*	
(1)	MANUFACTURER:	Individual aircraft are amateur constructed, BMAA is responsible for continued airworthiness.
(2)	UK IMPORTER:	UK Importer of Kits, Reality Aircraft Ltd, Unit 1a Amesbury Business Park, London Road, Amesbury, Wilts hire, SP4 7LS
(3)	CERTIFICATION:	BCAR SECTION S, (in the modification state at the date of manufacture or modification of any example)
(4)	DEFINITION OF BASIC STANDARD:	GA drawings held by BMAA technical office.
(5)	COMPLIANCE WITH THE MICROLIGHT DEFINITION	
	(a) MTOW	450 kg
	(b) No. Seats	2
	(c) Maximum Wing Loading	46 kg/m <sup>2</sup>
	(d) V <sub>so</sub>	34 kn CAS / MTOW
	(e) Permitted range of pilot weights	55 – 100 kg per seat.
	(f) Typical Empty Weight (ZFW)	198 kg
	(g) ZFW + 172 kg crew + 1 hr fuel (27 litres / 20 kg)	385 kg
	(h) ZFW + 86 kg pilot + full fuel (40 litres / 29 kg)	313 kg
	(i) Max allowed ZFW at initial permit issue <sup>#</sup>	263 kg (503 variants) 250 kg (Jabiru variants)

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\* Note: During aircraft construction, this HADS is to be used with the Easy Raider stage inspection sheets, form BMAA/AW/022 (Easy Raider). If there is a conflict between the two, the latest HADS will always take precedence.

<sup>#</sup> The maximum ZFW is the lower of [(a)-(172kg+1hrs fuel)] or [(a)-(86kg+full fuel)].  
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**(6) POWER PLANTS**

Designation	Easy Raider 503 (1)	Easy Raider R100(1)	
Engine Type	Rotax 503UL-2V-DCDI	BMW R100	
Reduction Gear	C-type 3:1	Rotax C-type 2.62:1	
Exhaust System	Rotax long exhaust	TBD	
Intake System	K&N twin filters	TBD	
Propeller Type	Powerfin, composite GA, 3 blade	Powerfin, composite GA, 2 blade	
Propeller Dia x Pitch	70" x 14°	70", pitch tbd	
Noise Type Cert No.	173M issue 1	TBD	
MAAN approving	1545	TBD	

Designation	Easy Raider J2.2 (1)	Easy Raider J2.2(2)	
Engine Type	Jabiru 2200A (Serial 22A710 or later)		
Reduction Gear	Direct drive	Direct drive	
Exhaust System	Jabiru standard	Jabiru standard	
Intake System	K&N	K&N	
Propeller Type	Powerfin, composite GA, 2 blade	Newton wood	
Propeller Dia x Pitch	64", 9.5° at tip	60" x 40"	
Noise Type Cert No.	173M issue 2	173M issue 3	
MAAN approving	1602	1620	

**(7) MANDATORY LIMITATIONS:**

- |                         |   |
|-------------------------|---|
| (A) Max Take-Off Weight | 450 kg                                  |
| (B) CG Limits           | Aft limit: 15" AoD<br>FWD Limit: 9" AoD |
| (C) CG datum            | Wing leading edge                       |

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(D) Cockpit Loadings	Front	Rear	Total
	Min 55 kg	-	55 kg
	Max 100 kg	100kg	200 kg
(E) Never Exceed Speed	115 kn CAS (V <sub>DF</sub> 127 kn CAS)		
(F) Manoeuvring Speed	73 kn CAS		
(G) Flaps Limiting Speed	68 kn CAS		
(H) Permitted Manoeuvres	60° bank Non Aerobatic Normal acceleration limits, +4 / -2g		
(I) Fuel Contents (Max Useable)	40 litres		

(J) Power Plant See Table

Engine	Rotax 503UL-2V-DCDI	Jabiru 2.2L	BMW R100
Max RPM	6,800	3,100	TBD
Max CHT	250°C / 450°F	250°C	TBD
Max EGT	650°C / 1200 °F	N/A	TBD
Fuel Spec	83 MON or 90 RON minimum unleaded to BS(EN)228 or 97+ octane MOGAS leaded fuel to BS 4040, or AVGAS 100LL.		
Engine Oil Spec	As required by engine manual		TBD
Gearbox oil spec	As required by gearbox manual	NA	As required by gearbox manual
Fuel/Oil Mix	50:1	NA	NA
Max. Coolant Temperature	n/a	NA	TBD
Max. Oil Pressure	n/a	525kPa / 76psi	TBD
Min. Oil Pressure		220 kPa / 31psi – normal use. 80 kPa / 11psi @ idle	TBD
Oil Temperature		118°C cont.	TBD
Fuel pressure at cruise power	0.2 to 0.4 bar	N/A	TBD

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**(8) Instruments Required:**

ASI	Altimeter	RPM	EGT	Compass	Coolant temp	CHT	Fuel Pressure	VSI	Slip ball
Required (to 130kn / 150 mph min.)	Required	Required	Required (2-stroke engines)	Required	At least one required**		Optional <sup>1</sup>	Optional	Optional (Recommended)

**(9) CONTROL DEFLECTIONS:**

Elevator UP:	30 ± 5°	Tailplane trim UP:	30 ± 5°
Elevator DOWN:	16 ± 2°	Tailplane trim DOWN:	30 ± 5°
Ailerons UP:	20 ± 5°	Rudder LEFT:	30 ± 5°
Ailerons DOWN:	30 ± 5°	Rudder RIGHT:	30 ± 5°
Flaps UP:	0		
Flaps DOWN:	15, 28, 40 ± 2°		

**(10) PILOT'S NOTES, MAINTENANCE MANUALS REFERENCES:**

10.1 Manuals approved for use with this aircraft.

- (a) Easy Raider Operators Manual Issue 1.
- (b) Manufacturer's engine manual (contained at Annex B of the operators manual for a particular aircraft)
- (c) Other manuals as listed at Annex F of the operators manual for a particular aircraft.
- (d) Construction to Easy Raider construction manual – to be issued.

10.2 The following placards are to be fitted:-

(a) Flight Limitations Placard (to be visible to pilot) See Annex D.

(b) Engine Limitations Placard (to be located near to engine instruments)  
See Annex D.

(c) Fuel Limitations Placard (to be located near to filler cap)

If MTOW + 200kg occupancy + full fuel exceeds MTOW, a placard is to be fitted showing fuel capacity, fuel type(s), fuel:oil ratio (if relevant) and if MTOW can be exceeded with full fuel and 180kg cockpit weight, the fuel loads at MTOW for cockpit weights of 180kg / 170kg / 160kg etc. at 10kg intervals down to the maximum fuel load. An example is shown at Annex D.

(d) ASI Placard

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<sup>1</sup> Fuel pressure gauge required for testing first example of an engine type only  
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Unless at in-flight calibration all ASI readings were within 2 kn of CAS, a correction placard from  $V_{S0}$  to  $V_{ne}$  at no more than 10 kn intervals, and at  $V_{S0}$ ,  $V_{S1}$ ,  $V_a$  and best glide speed, must show the corrections from IAS to CAS. For values, see the approval MAAN for the particular aircraft. An example is shown at Annex D.

(e) Pitch Trimmer Instructions

See Annex D.

(f) Switches

See Annex D.

Note: It is recommended that airspeed placards are not fitted to new aircraft until after flight testing, due to the requirement for pitot-static system calibrations.


**(11) MANDATORY MODIFICATIONS / SERVICE BULLETINS / AIRWORTHINESS DIRECTIVES ETC:**

See Annex A for required modifications.

**(12) MINIMUM PERFORMANCE AT MAX TAKE-OFF WEIGHT**

Rate of Climb: 300 fpm at 44 kn CAS (503 engine)  
740 fpm at 44 kn CAS (J2200 engine)

Stall or Minimum Flying Speed: 34 kn CAS at MTOW in the landing configuration, see operators manual part 4.12 for scheduled performance at other weights).

BMAA Approval:		G B Gratton Chief Technical Officer	23 Oct 2002
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Issue History

- HM6 Issue A Draft, to permit initial construction and flight testing. Type originally designated SkyRaider II (UK)
- HM6 issue 1 Issued on completion of first example, authorised by MAAN 1545, change of designation to Easy Raider.
- HM6 issue 2 Approval of variant J2.2(1), 3-view drawing, change of Fwd CG limit from 10" to 9" AoD. Kuntzelman strobes changed from mod A5 to B1, addition of inspection points 2,3. Authorised by MAAN 1602
- HM6 issue 3 Approval of variant J2.2(2), addition of optional mod B2, clarification of Jabiru engine identity, approved by MAAN 1620.

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Illustration of Aircraft - 3 View

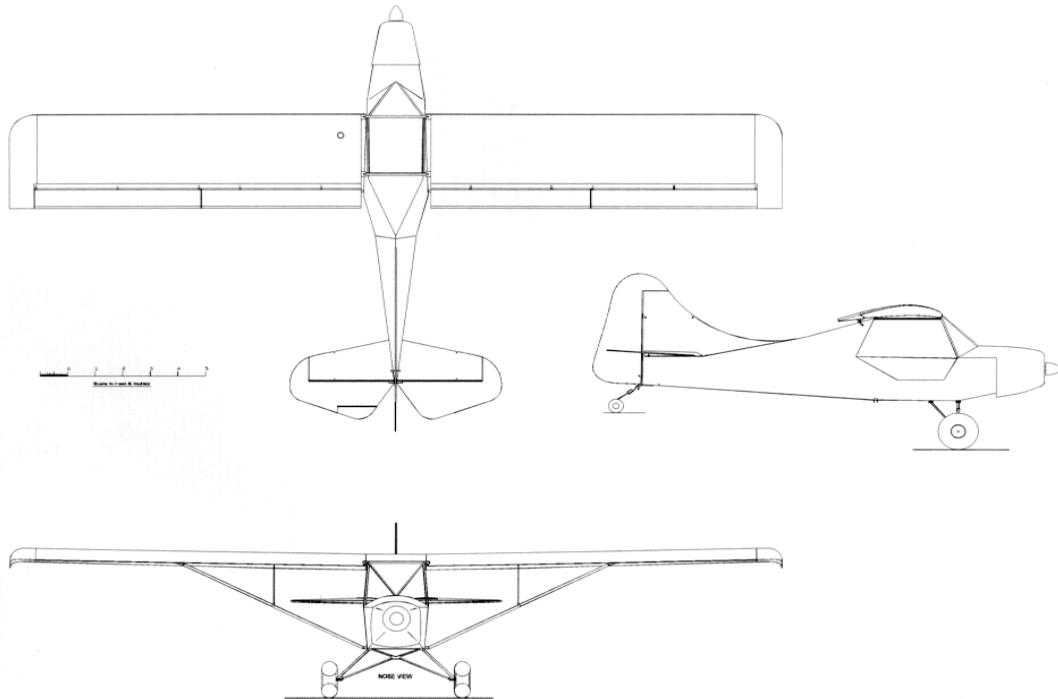


Illustration of Aircraft - Photograph



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ANNEX A – MANDATORY MODIFICATIONS

Modifications A1-A4 should be included within the kit, but are required for UK approval and therefore must be checked. Others are to be incorporated by the builder.

<b><u>No.</u></b>	<b><u>Description</u></b>
A1	Introduction of larger dorsal fin.
A2	Drilling out of bolt-hole in elevator horn and insertion of bush, with re-fitment of original AN3 bolt.
A3	Second fairleads on aileron cables as they run up the wing struts.
A4	Relocation of flap lever to position above pilot's left shoulder.
A5	<deleted>
A6	Small round window in top of wing root, allowing light to pass through fuel tank to sight gauge in cabin.

ANNEX B – APPROVED OPTIONAL MODIFICATIONS

<b><u>No.</u></b>	<b><u>Description</u></b>
B1	Kuntzleman "dual-magnum" strobes fitted to the wingtips.
B2	Addition of padding, checked not to interfere with operation, around the flap lever.

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ANNEX C

WEIGHING INFORMATION

Note: W&CG should be checked with baggage compartment empty. CG limits take into account use of the baggage compartment, within placarded limits, putting the CG slightly aft of that shown here<sup>2</sup>

1. CG Datum: Wing leading edge (positive aft)
2. Weighing attitude: Headrack level. [Tailwheel 18" (45cm) above mainwheels. All tyre pressures to be checked (15 psi / 100 kPa).]
3. Mainwheel moment arm: - 8.75"
4. Tailwheel moment arm: + 142"  
(+139.25 on G-SRII, first prototype)
5. Fuel moment arm: + 15" (maximum capacity normally 40 litres)
6. Crew moment arm: Pilot: + 10"  
Pax: + 29"
7. Crew weights: Minimum 55 kg / maximum 100 kg  
(maximum reducible, not below 86 kg, if required; this is likely to be necessary for the rear seat).
8. Aft CG Limit: 15" AoD
9. Fwd CG Limit: 9" AoD

Note: From HADS issue 2, there is not considered by BMAA to be any scope for further extension of the CG limits either fore or aft, without modification to the aircraft.

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<sup>2</sup>. The baggage compartment is at 44" aft of datum and the handling limit is 16.5" (15.5" with 40° flaps). At worst case, 5kg baggage gives 15.5" CG, 15kg gives 16.5" CG when loaded within the stated limits for seats and fuel.

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ANNEX D

EXAMPLE PLACARDS

(a) Flight Limitations Placard (to be visible to pilot)

<u>Easy Raider [Engine] [Registration]</u>	
Never Exceed Speed:	_____ IAS *
Manoeuvring Speed :	_____ IAS *
Stall Speed, full flaps ( $V_{so}$ ):	_____ IAS *
Stall Speed, clean ( $V_{s1}$ ):	_____ IAS *
Best climb speed:	_____ IAS *
Best glide speed:	_____ IAS*
Bank angle limits:	+/- 60°
Normal Acceleration Limits:	+4 / -2g
Empty Weight:	_____ kg **
Max Take-Off Weight:	450 kg
Minimum Cockpit Weight:	55 kg
Maximum Cockpit Weight:	100 kg in each seat.
Maximum Baggage Load:	15 kg (see operators manual)
Aerobatics and deliberate spinning prohibited.	

\*Values and units IAS will be given in the approval MAAN for the individual aircraft.

\*\* This must match the most recent W&CG report for the aircraft.

(b) Engine Limitations Placard (to be located near to engine instruments)

A placard showing the limitations for all indicated engine parameters is to be mounted close to the engine instruments. This requirement need not be complied with for limitations shown as coloured markers (red for danger, amber for caution) on the instrument displays.

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(c) Fuel Limitations Placard (The following placard is to be displayed close to the fuel sight gauge or one adjacent to each filler cap)

<b>FUEL</b>	
Total Capacity 40 / 72 Litres (50:1 2-Stroke Oil / Add No Oil) <sup>3</sup>	
<u>Cockpit Load (kg)</u> (including baggage)	<u>Max Fuel Load (litres)</u>
215 ---- _____ or below	40 (Full)
83 MON or 90 RON minimum unleaded to BS(EN)228 or 97+ octane 4-star / MOGAS leaded fuel to BS 4040, or AVGAS 100LL	
<b>Note : Vent pipes in filler caps should always be pointing forward when fully tightened.</b>	

(e) ASI Placard

<i>kn CAS</i> (Calibrated)	<b>30</b>	<b>34 (V<sub>SO</sub>)</b>	<b>36.5</b> (V <sub>SI</sub> )	<b>38</b> (Best Glide)	<b>40</b>	<b>44 (V<sub>X</sub>)</b> (Best Climb)	<b>50</b>	<b>60</b>
IAS (Indicated)								
<b>Note: Stall speeds are at MTOW, at lower weights they will reduce. For best glide at high weight, fly at V<sub>S</sub>+5 kn.</b>								
<i>kn CAS</i> (Calibrated)	<b>68 (V<sub>F</sub>)</b> (Flap Limit)	<b>70</b>	<b>73</b> (V <sub>A</sub> )	<b>80</b>	<b>90</b>	<b>100</b>	<b>110</b>	<b>115</b> (V <sub>NE</sub> )
IAS (Indicated)								

A red radial line is to be marked on the ASI dial at V<sub>ne</sub>, an amber arc is to be marked between V<sub>a</sub> and V<sub>ne</sub>, a white arc is to be marked between V<sub>s</sub> and V<sub>f</sub>.

(e) Pitch Trimmer Instructions

PITCH TRIM    nose down ← → nose up
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<sup>3</sup> Statement concerning oil as required for engine fitted to individual aircraft.  
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(f) Miscellaneous

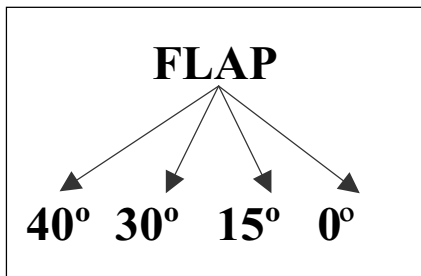
(Note: All switches must be placarded with function and sense of operation (up=on) even if the placards are not listed below).

**REMOVE  
TURTLEDECK  
BEFORE**  
REMOVING PIN

**Do not use 40°  
flap if >5kg in  
baggage sack**

**ON  
INTERCOM  
OFF**

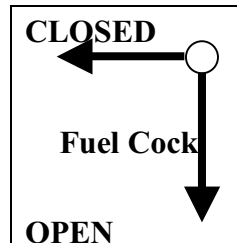
**IGNITION  
ON  
OFF**



**NO STEP**

**ON  
STROBES  
OFF**

**CHOKE – Pull on  
Turn clockwise  
to Lock**



**BAGGAGE**  
Max 15kg.

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ANNEX E

POINTS FOR SPECIAL ATTENTION

In service, the following points have been found to be commonly recurring faults, and Inspectors must give special attention to the following both during initial approval, and during later inspections.

1. Placards must be as stated in the approval **MAAN**, and not use CAS values as given in the HADS.
2. If the manual pitch trimmer is fitted, appearance and shape must be significantly different from the throttle. The knob should not be red, which might cause confusion with a mixture control.
3. Carb heat (if fitted, Jabiru engines) knob must be adjusted so that when pulled out (to hot), it can be pushed straight back in (to cold) without need for rotation or other action beyond a simple push.