

MICROLIGHT TYPE APPROVAL DATA SHEET (TADS)

NO: BM54 ISSUE: 4

- TYPE: Mainair Rapier
- (1) MANUFACTURER: P & M Aviation Ltd, Unit B, Crawford Street
Rochdale, Lancashire, OL16 5NU.
- (2) UK IMPORTER: N/A
- (3) CERTIFICATION: BCAR Section S Issue 1
- (4) DEFINITION OF BASIC STANDARD: Betawing Drawing Register 27th April 1994
Gemini 2 Drawing Register Issue 3, 5th November 1996
(as amended)
- (5) COMPLIANCE WITH THE MICROLIGHT DEFINITION
- | | |
|---|--|
| (a) MTOW | 370 kg |
| (b) No. Seats | 2 |
| (c) Maximum Wing Loading | 23.72 kg/m ² |
| (d) V _{so} | 30 mph |
| (e) Permitted range of pilot weights | 55 – 90 kg per seat. |
| (f) Typical Empty Weight (ZFW) | (Rapier 503) 152kg
(Rapier 462) 152kg |
| (g) ZFW + 172 kg crew + 1 hr fuel
(litres / kg) | (503) 339kg
(426) 343 kg |
| (h) ZFW + 86 kg pilot + full fuel
(litres / kg) | (503) 270kg [285kg
with mod 99]
(462) 270kg [285kg
with mod 99] |
| (i) Max ZFW at initial permit issue | (503) 183 Kg
(462) 179 kg |

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(6) POWER PLANTS

Designation	<i>Rapier 503</i>	<i>Rapier 503</i>	<i>Rapier 503</i>
Engine Type	<i>Rotax 503-2V Upright Twin Electronic Ign.</i>	<i>Rotax 503-2V Upright Twin Electronic Ign.</i>	<i>Rotax 503-2V Upright Twin Electronic Ign.</i>
Reduction Gear	<i>2.58:1</i>	<i>2.58:1</i>	<i>2.58:1</i>
Exhaust System	<i>Rotax Side Mounted with After Muffler</i>	<i>Rotax Side Mounted with After Muffler</i>	<i>Rotax Side Mounted with After Muffler</i>
Intake System	<i>Intake Filter or Rotax Intake Silencer</i>	<i>Intake Filter or Rotax Intake Silencer</i>	<i>Intake Filter or Rotax Intake Silencer</i>
Propeller Type	<i>Mainair</i>	<i>Mainair Grd Adjustable</i>	<i>Mainair WD Grd Adj</i>
Propeller Dia x Pitch	<i>62" x 40"</i>	<i>3 Blade 62" 110deg at 12"</i>	<i>3 Blade 62" 113deg at 12"</i>
Noise Type Cert No.	<i>133M</i>	<i>133M</i>	<i>133M</i>
AAN approving configuration	<i>25895</i>	<i>25895</i>	<i>25895</i>

Designation	<i>Rapier 462</i>	<i>Rapier 462</i>	<i>Rapier 462</i>
Engine Type	<i>Rotax 462 Upright</i>	<i>Rotax 462 Upright</i>	<i>Rotax 462 Upright</i>
Reduction Gear	<i>2.58:1</i>	<i>2.58:1</i>	<i>2.58:1</i>
Exhaust System	<i>Rotax Side Mount with After Muffler</i>	<i>Rotax Side Mount with After Muffler</i>	<i>Rotax Side Mount with After Muffler</i>
Intake System	<i>Rotax Intake Silencer</i>	<i>Rotax Intake Silencer</i>	<i>Rotax Intake Silencer</i>
Propeller Type	<i>Mainair</i>	<i>Mainair Ground Adjustable</i>	<i>Mainair WD Grd. Adjustable</i>
Propeller Dia x Pitch	<i>62" x 44"</i>	<i>3 Blade 62" 107deg at 12"</i>	<i>3 Blade 62" 113deg at 12"</i>
Noise Type Cert No.	<i>35m</i>	<i>35m</i>	<i>35m</i>
AAN approving configuration	<i>25895</i>	<i>25895</i>	<i>25895</i>

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(7) MANDATORY LIMITATIONS:

(A) Max Take-Off Weight	370 Kg		
(B) CG Limits	N/A		
(C) CG datum	N/A		
(D) Cockpit Loadings	Front	Rear	Total
	Min 55kg	15 kg	70 kg
	Max 90kg	90 kg	180 kg
(E) Never Exceed Speed	101 mph		
(F) Manoeuvring Speed	60 mph		
(G) Permitted Manoeuvres	30° Nose up / 30° nose down 60deg Max Bank Angle Non Aerobatic Normal acceleration limits, +4 / -0g		
(H) Fuel Contents (Max Useable)	44 litres (twin tank system) 65 litres (Optional Modification 99)		

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(I) Power Plant See Table

Engine	Rotax 503-2V Upright	<i>Rotax 462 Upright</i>		
Max RPM	6800	6800		
MAX CHT	250 degC	150 degC		
MAX EGT	650 degC	650 degC		
Fuel Spec	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.			
Engine Oil Spec	Two Stroke Oil ASTM/CEC Standards, API- TC Classification	Two Stroke Oil ASTM/CEC Standards, API- TC Classification		
Gearbox oil spec	API-GL5 or GL6, SAE 140 EP	API-GL5 or GL6, SAE 140 EP		
Fuel/Oil Mix	50/1	50/1		
Coolant Temperature	N/A	80 DegC		
Oil Pressure	N/A	N/A		
Oil Temperature	N/A	N/A		
Fuel Pressure	N/A	N/A		

(8) INSTRUMENTS REQUIRED:

ASI	Altimeter	RPM	CHT / EGT	Compass	Coolant temp	Fuel Pressure	VSI	Slip ball
Required (to 90 mph min.)	Required	Required (Twin Ign Only)	N/A	N/A	N/A	N/A	N/A	N/A

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(9) CONTROL DEFLECTIONS: N/A

Elevator UP:	±	Tailplane trim UP:	±
Elevator DOWN:	±	Tailplane trim DOWN	±
Ailerons* UP:	±	Rudder LEFT:	±
Ailerons* Down:	±	Rudder RIGHT:	±

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

10.1 Manuals approved for use with this aircraft.

(a) Rapier Microlight Manual Doc Ref RA Manual (at appropriate issue)

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)

A placard is to be fitted showing fuel capacity (litres), fuel type(s), fuel:oil ratio (if relevant) and if MTOW can be exceeded with full fuel and maximum cockpit weight, the fuel loads at MTOW for cockpit weights. An example is shown at Annex D.

(d) Switches

See Annex D.

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

CAA MPD 2001-004 Upper torso restraint

Annual Bettsometer test is to be carried out to 1050 grammes with wing sails fitted and tensioned to flight. Test must be to both upper and lower surfaces.

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

Rate of Climb: 600 ft/min at 55mph

Stall or Minimum Flying Speed: 30mph IAS at MTOW / idle.

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Issue History

<u>Issue No.</u>		<u>Reason and signatory</u>
1	03/03/99	Initial issue
2	08/07/02	Update using new format J BARRATT
3	06/07/05	New company name J BARRATT
4	18/11/09	To record Modification Number 187, which increases seat load limit to 110kg but still with a total cockpit load of 180g.


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Illustration of Aircraft - 3 View

CIVIL AVIATION AUTHORITY
MICROLIGHT TYPE APPROVAL DATA SHEET
NO. BM-54 ISSUE: 2

OWAS NO. 01-144-0055K
TITLE MORNING STAR
DATE 1999-01-14
SUPERSEDES
REF. DATE
AMENDMENT
FOR TYPE DESIGN BY THE SOCIETY OF AIRCRAFT DESIGNERS 100, 1000, 10000
MAINTENANCE LTD TEL: 01226 551134 TELEPHONE: 01226 551134 GENERAL: 01226 551134 FAX: 01226 551134

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ANNEX A

MANDATORY MODIFICATIONS

98 Shoulder Straps (MPD 2001-004 refers)

ANNEX B

APPROVED OPTIONAL MODIFICATIONS

The installation of all optional modifications is to be inspected by a BMAA inspector and an entry made in the appropriate logbook(s). Note that other approved modifications may exist which are not listed here.

Mainair

Modification Number

41	Q.D Rear Seat Steering
45	Boss Ballast Bag
50	Wing Override Instructor Bars
89	Adjustable Index Tips
90	Clear Fuel Filter
93	Intake Silencer
99	65 litre Fuel Tank
187	Increase Seat Load Limit to 110kg

ANNEX C

WEIGHING INFORMATION

1. CG Datum: N/A
2. Weighing attitude: N/A
3. Mainwheel moment arm: N/A
4. Nosewheel moment arm: N/A ____ (units) (direction) of datum
5. Fuel moment arm: N/A ____ (units) (direction) of datum
6. Crew moment arm: N/A ____ (units) (direction) of datum
7. Crew weights: Minimum 55 kg / maximum 90 kg
(maximum reducible, not below 86 kg, if required).
8. Aft CG Limit: N/A ____ (units) (direction) of datum
9. Fwd CG Limit: N/A ____ (units) (direction) of datum

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ANNEX D

EXAMPLE PLACARDS

(a) Flight & Engine Limitations Placard (to be visible to pilot) [Typical Examples]

MAINAIR RAPIER	
MAX. ALL UP WEIGHT	370KG
MIN. ALL UP WEIGHT	230KG
EMPTY WEIGHT	153KG
STALL SPEED	30MPH
NEVER EXCEED (V.N.E.)	101MPH
MIN LANDING APPROACH	50 MPH
MAX CROSS WIND	10MPH
REC. ENGINE EGT	MAX 650 DEGC
REC ENGINE CHT	MAX 150 DEGC
REC. ENGINE MAX	6800RPM

WARNING

**THIS AIRCRAFT IS
NON-AEROBATIC**

MAXIMUM NOSE UP 30DEG
MAXIMUM NOSE DOWN 30DEG
MAXIMUM BANK ANGLE 60DEG
SPINNING ATTEMPTS PROHIBITED
NO WHIPSTALLS LOOPS TAILSLIDES
OR AEROBATIC MANOEUVRES

DO NOT EXCEED MAX LOAD

(b) Fuel Limitations Placard (to be visible to pilot)

Empty Wt Kg

Date

Fuel Load (litres)	Max Cockpit Wt (kg)
65	
55	
45	
35	
25	
15	
5	

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- (c) Fuel Capacity and Type (to be located near to filler cap)

FUEL - 22 LITRES

**EN228 UNLEADED or AVGAS 100LL
INSPECT INTERNAL AND EXTERNAL
FILTERS FREQUENTLY**

2 STROKE OIL MIX AT RATIO 50:1

FUEL - 65 LITRES

**EN228 UNLEADED or AVGAS 100LL
INSPECT INTERNAL AND EXTERNAL
FILTERS FREQUENTLY**

2 STROKE OIL MIX AT RATIO 50:1

- (d) Switches

All switches are to be marked with function and sense (up = on, down = off)