

MICROLIGHT TYPE APPROVAL DATA SHEET (TADS)

NO: BM14 ISSUE: 9

- TYPE: Gemini Flash 2
- (1) MANUFACTURER: Mainair Sports Ltd now supported by P & M Aviation Ltd,
Unit B, Crawford Street Rochdale, Lancashire, OL16 5NU.
- (2) UK IMPORTER: N/A
- (3) CERTIFICATION: BCAR Section S, Advance Issue March 1983
BCAR Section S, Paper, 11 October 1988
- (4) DEFINITION OF BASIC STANDARD: 440 Dual Master List of Drawings, Issue 7
Flash Wing Master Drawing List, Issue 5
- (5) COMPLIANCE WITH THE MICROLIGHT DEFINITION
- | | |
|---|--|
| (a) MTOW | 344 kg (pre Mod 21A)
370 kg (post Mod 21A) |
| (b) No. Seats | 2 |
| (c) Maximum Wing Loading | 23.78 kg/m ² |
| (d) V _{so} | 24 kts (25 mph) |
| (e) Permitted range of pilot weights | 55 – 90 kg per seat. |
| (f) Typical Empty Weight (ZFW) | (Flash2 440) 145kg
(Flash2 447) 145kg
(Flash2 503) 145kg
(Flash2 462) 145kg |
| (g) ZFW + 172 kg crew + 1 hr fuel
(litres / kg) | (440) 337kg
(447) 328 kg
(503) 332 kg
(462) 336 kg |
| (h) ZFW + 86 kg pilot + full fuel
(litres / kg) | (440) 263 Kg
(447) 263 kg
(503) 263 kg [278 kg
with mod 99]
(462) 263 kg [278 kg
with mod 99] |
| (i) Max ZFW at initial permit issue | 178 Kg |

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(6) POWER PLANTS

Designation	<i>Gemini Flash 2 440</i>	<i>Gemini Flash 2 440</i>	<i>Gemini Flash 2 447</i>	<i>Gemini Flash 2 447</i>	<i>Gemini Flash 2 447</i>	<i>Gemini Flash 2 447</i>
Engine Type	<i>Fuji Robin EC44PN Upright</i>	<i>Fuji Robin EC44PN Inverted</i>	<i>Rotax 447 Inverted</i>	<i>Rotax 447 Inverted</i>	<i>Rotax 447 Upright</i>	<i>Rotax 447 Upright</i>
Reduction Gear	<i>2.67:1</i>	<i>2.67:1</i>	<i>2.58:1</i>	<i>2.58:1</i>	<i>2.58:1</i>	<i>2.58:1</i>
Exhaust System	<i>Rota Flow Underslung</i>	<i>Rota Flow Underslung</i>	<i>Rotax 2 x 90 Underslung</i>	<i>Rotax 2 x 90 Underslung</i>	<i>Rotax Side Mounted</i>	<i>Rotax Side Mounted</i>
Intake System	<i>Unique Foam Muffler</i>	<i>Unique Foam Muffler</i>	<i>Rotax Intake Muffler</i>	<i>Rotax Intake Muffler</i>	<i>Rotax Intake Muffler</i>	<i>Rotax Intake Muffler</i>
Propeller Type	<i>Mainair Sports Round Tip</i>	<i>Mainair Sports Round Tip</i>	<i>Newton</i>	<i>Mainair Sports</i>	<i>Mainair Sports</i>	<i>Mainair Sports</i>
Propeller Dia x Pitch	<i>62" x 30"</i>	<i>62" x 30"</i>	<i>62" x 38"</i>	<i>62" x 37"</i>	<i>62" x 35"</i>	<i>62" x 40"</i>
Noise Type Cert No.	<i>5M</i>	<i>12M</i>	<i>12m</i>	<i>12m</i>	<i>27m</i>	<i>28m</i>
AAN approving configuration	<i>19421</i>	<i>19421</i>	<i>19421</i>	<i>19421</i>	<i>19590</i>	<i>19590</i>

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Designation	<i>Gemini Flash 2 503</i>	<i>Gemini Flash 2 503</i>	<i>Gemini Flash 2 462</i>	<i>Gemini Flash 2 462</i>	<i>Gemini Flash 2 462</i>
Engine Type	<i>Rotax 503 Upright Single Points Ign</i>	<i>Rotax 503 Upright Single Points Ign</i>	<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>	<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 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>	<i>Rotax Intake Silencer</i>	<i>Rotax Intake Silencer</i>
Propeller Type	<i>Mainair</i>	<i>Mainair Grd Adjustable</i>	<i>Mainair Round Tip</i>	<i>Mainair Square Tip</i>	<i>Mainair Ground Adjustable</i>
Propeller Dia x Pitch	<i>62" x 40"</i>	<i>3 Blade 62" 107deg at 12"</i>	<i>62" x 44" or 62" x 46"</i>	<i>62" x 46"</i>	<i>3 Blade 62" 107deg at 12"</i>
Noise Type Cert No.	<i>26M</i>	<i>50M</i>	<i>35m</i>	<i>35m</i>	<i>35m</i>
AAN approving configuration	<i>19197</i>	<i>20375</i>	<i>19213 Ad1</i>	<i>19213 Ad1</i>	<i>20375</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	77 knots (89 mph)		
(F) Manoeuvring Speed	38 knots (44 mph)		
(G) Permitted Manoeuvres	30° Nose up / 30° nose down 45deg Max Bank Angle Non Aerobatic Normal acceleration limits, +4 / -0g		
(H) Fuel Contents (Max Useable)	44 litres (22 litre optional) 65 (Mod 99 fitted 503 & 462 only)		

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(I) Power Plant See Table

Engine	Fuji 440 Upright or Inverted	<i>Rotax 447</i> <i>Upright or</i> <i>Inverted</i>	Rotax 503 Upright	<i>Rotax 462</i> <i>Upright</i>
Max RPM	6900	6800	6800	6800
MAX CHT	218 degC	250 degC	250 degC	150 degC
MAX EGT	815 degC	650 degC	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	Two Stroke Oil ASTM/CEC Standards, API- TC Classification	Two Stroke Oil ASTM/CEC Standards, API- TC Classification
Gearbox oil spec	N/A	API-GL5 or GL6, SAE 140 EP	API-GL5 or GL6, SAE 140 EP	API-GL5 or GL6, SAE 140 EP
Fuel/Oil Mix	40/1	50/1	50/1	50/1
Coolant Temperature	N/A	N/A	N/A	80 DegC
Oil Pressure	N/A	N/A	N/A	N/A
Oil Temperature	N/A	N/A	N/A	N/A
Fuel Pressure	N/A	N/A	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	N/A	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) Flash 2 Microlight Manual Doc Ref GF 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). 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 1995-005 R1	Inspection of main vertical strut
CAA MPD 1995-012	Flight limitations
CAA MPD 1995-016	Front stub heavy landing overload damage
CAA MPD 2000-003	Inspection of wing rigging
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: 500 fpm at 47 (42mph) IAS.

Stall or Minimum Flying Speed: 24kts (25mph) IAS at MTOW / idle.

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Issue History

<u>Issue No.</u>	<u>Reason and signatory</u>
1	25/03/86 Initial Issue J WRAITH
2	30/05/86 Rotax 462 option J WRAITH
3	18/07/86 Rotax 503 option J WRAITH
4	25/09/87 Mainair Ground adjustable propeller and additional optional modifications. J WRAITH
5	___/12/91 Additional optional modifications K D RUSSELL
6	26/06/95 Minor editorial corrections K D RUSSELL
7	08/07/02 Update to using new format J BARRATT
8	06/07/05 New company name J BARRATT
9	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

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ANNEX A – MANDATORY MODIFICATIONS

Modification 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.

<u>Mainair</u> <u>Modification Number</u>	<u>Description</u>
1	Single Lap Seat Belts
2	Extended Front Stub
3	Inverted 440 engine
4	Nylon Steering Bearings
5	Rotax 447 Engine Option
6	Wheel Spats
7	Rear Seat Steering
8	Electrical Wiring Box
9	Wing Fabric
10	Top Tank
11	Rotax (Upright) 503 engine installation
12	Rotax 462 engine installation
12a	Rotax 462 Fuel Heating
12b	Rotax 462 + 62" x 42" Tip Propeller
12c	Rotax 462 + 62" x 44" Rd. Tip Propeller
12d	Rotax 462 + 62" x 46" Rd. Tip Propeller
14	Fuji Propeller bolts (5/16")
15	Additional sleeve and back up wire - Vertical Strut
16	Front Strut Back Up Wire
17	Front Suspension - Gas Spring Dampers
18	Transit Yoke
20	Rotax 447 Engine (Upright Installation)
21	Rear Fuel Tank (Upright Rotax Engines)
21a	Additional Fuel Capacity (See Appendix 2)
22	Alternative Ignition Switch Position
23	Flash 2 - 2880 Side Wires
25	Spring Return Throttle Mixer on Cables

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26	Steel Muffler Brackets
27	Fireproof filter between Pump and Carburettor
28	Mark II Control Frame Fitting (Longer Socket)
29	Cranked Seat Hinge Plates (Dwg 99-99-14J)
32	3 blade propeller on Flash/Flash 2 (A) and Scorcher
38	Rear Dip Pipe Locator (Dwg 99-44-168)
39	Negative Load Wing Warning Sticker 00-02
40	Fibreglass Exhaust Shield 99-44-204
45	Boss Ballast Bag (Dwg 99-44-500)
50	Flash Wing Override Instructor Bars
53	Nose Cone Warning Lable
55	Radiator Top Mounting
69	Wiring For Point Ign (Rotax)
77	Trailing Link Front Susp & Brake
83	Mercury Mud Guard
86	Alloy Wheels
90	Clear Fuel Filter
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]

GEMINI FLASH2	
MAX. ALL UP WEIGHT	370KG
MIN. ALL UP WEIGHT	234KG
EMPTY WEIGHT	145KG
STALL SPEED	23KTS-28MPH
NEVER EXCEED (V.N.E.)	77KTS-89MPH
MIN LANDING APPROACH	36KTS-42MPH
MAX CROSS WIND	8KTS-10MPH
REC. ENGINE EGT	650 DEGC
REC ENGINE CHT	150 DEGC
REC. ENGINE MAX	6800RPM

WARNING
THIS AIRCRAFT IS NON-AEROBATIC
MAXIMUM NOSE UP 30DEG
MAXIMUM NOSE DOWN 30DEG
MAXIMUM BANK ANGLE 45DEG
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)