

MICROLIGHT TYPE APPROVAL DATA SHEET (TADS)

NO: BM23 ISSUE: 14

- TYPE: Gemini Flash 2 Alpha
- (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 | 370 kg |
| (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) | (Alpha 503) 149kg
(Alpha 462) 149kg
(Alpha 503-2V) 151kg
(Alpha 582) 157kg |
| (g) ZFW + 172 kg crew + 1 hr fuel
(litres / kg) | (503) 336kg
(426) 340 kg
(503-2V) 338 kg
(582) 347 kg |

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(h) ZFW + 86 kg pilot + full fuel (litres / kg)	(503) 267 Kg [290 kg with mod99]
	(462) 267 kg [292 kg with mod99]
	(503-2V) 269 kg [292 kg with mod99]
	(582) 275 kg [298 kg with mod99]
(i) Max ZFW at initial permit issue	(503) 183 kg
	(462) 179 kg
	(503-2V) 183 kg
	(582) 180 Kg

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(6) POWER PLANTS

Designation	<i>Gemini Flash 2 Alpha 503</i>	<i>Gemini Flash 2 Alpha 503</i>	<i>Gemini Flash 2 Alpha 503</i>	<i>Gemini Flash 2 Alpha 462</i>	<i>Gemini Flash 2 Alpha 462</i>	<i>Gemini Flash 2 Alpha 462</i>	<i>Gemini Flash 2 Alpha 462</i>
Engine Type	<i>Rotax 503 Upright Single Points Ign or Twin Electronic Ign.</i>	<i>Rotax 503 Upright Single Points Ign or Twin Electronic Ign.</i>	<i>Rotax 503 Upright Single Points Ign or Twin Electronic Ign.</i>	<i>Rotax 462 Upright</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>	<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>	<i>Rotax Side Mount 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>	<i>Rotax Intake Silencer</i>	<i>Rotax Intake Silencer</i>
Propeller Type	<i>Mainair</i>	<i>Mainair Grd Adjustable</i>	<i>Mainair WD Grd Adj</i>	<i>Mainair Round Tip</i>	<i>Mainair Square Tip</i>	<i>Mainair Ground Adjustable</i>	<i>Mainair WD Grd. Adjustable</i>
Propeller Dia x Pitch	<i>62" x 40"</i>	<i>3 Blade 62" 107deg at 12"</i>	<i>3 Blade 62" 113deg 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>	<i>3 Blade 62" 113deg at 12"</i>
Noise Type Cert No.	<i>26M</i>	<i>50M</i>	<i>50M</i>	<i>35m</i>	<i>35m</i>	<i>35m</i>	<i>35m</i>
AAN approving configuration	<i>20331</i>	<i>20375</i>	<i>22913</i>	<i>20331</i>	<i>20331</i>	<i>20375</i>	<i>22913</i>

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Designation	<i>Gemini Flash 2 Alpha 503-2V</i>	<i>Gemini Flash 2 Alpha 503-2V</i>	<i>Gemini Flash 2 Alpha 503-2V</i>	<i>Gemini Flash 2 Alpha 582</i>	<i>Gemini Flash 2 Alpha 582</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>	<i>Rotax 582-2V Upright 40k Version</i>	<i>Rotax 582-2V Upright 40k Version</i>
Reduction Gear	<i>2.58:1</i>	<i>2.58:1</i>	<i>2.58:1</i>	<i>3.00:1</i>	<i>3.00:1</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>	<i>Rotax Side Mount with After Muffler</i>	<i>Rotax Side Mount with After Muffler</i>
Intake System	<i>Rotax Intake Silencer or K & N Filter</i>	<i>Rotax Intake Silencer or K & N Filter</i>	<i>Rotax Intake Silencer or K & N Filter</i>	<i>K & N Filter</i>	<i>K & N Filter</i>
Propeller Type	<i>Mainair</i>	<i>Mainair Grd Adjustable</i>	<i>Mainair WD Grd Adj</i>	<i>Mainair WD Grd Adjustable</i>	<i>Mainair WD Grd Adjustable</i>
Propeller Dia x Pitch	<i>62" x 40"</i>	<i>3 Blade 62" 110deg at 12"</i>	<i>3 Blade 62" 112 – 114deg at 12"</i>	<i>4 Blade 62"Dia 119deg at 12"r</i>	<i>4 Blade 62"Dia 125deg at 12"r</i>
Noise Type Cert No.	<i>133M</i>	<i>133M</i>	<i>133M</i>	<i>134m</i>	<i>134m</i>
AAN approving configuration	<i>22707 Ad1</i>	<i>22707 Ad 1</i>	<i>22707 Ad 1</i>	<i>22708 Ad 1</i>	<i>22708 Ad 2</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 60deg Max Bank Angle Non Aerobatic Normal acceleration limits, +4 / -2g		
(H) Fuel Contents (Max Useable)	44 litres (22 Optional) 65 litres (Mod99)		

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(I) Power Plant See Table

Engine	Rotax 503 Upright	<i>Rotax 462 Upright</i>	<i>Rotax 503-2V Upright</i>	<i>Rotax 582-2V Upright (40kw)</i>
Max RPM	6800	6800	6800	6400
MAX CHT	250 degC	150 degC	250 degC	150 degC
MAX EGT	650 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 leded 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	API-GL5 or GL6, SAE 140 EP	API-GL5 or GL6, SAE 140 EP	API-GL5 or GL6, SAE 140 EP	API-GL5 or GL6, SAE 140 EP
Fuel/Oil Mix	50/1	50/1	50/1	50/1
Coolant Temperature	N/A	80 DegC	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	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) Flash 2A 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 1995-021 Flight limitations
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: 490 fpm at 47 IAS.
Alpha 582 660 fpm at 47 mph

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	03/07/87	J D WATKINS
2	25/09/87	J D WATKINS
3	07/03/91	K D RUSSELL
4	18/03/91	Correction of prop pitch range and editorial changes. K D RUSSELL
5	08/05/91	Introduction of Rotax 582 engine (Mod No. 56) including Appendix 1 and further editorial changes. K D RUSSELL
6	01/07/91	Introduction of implications of modified front suspension (Mod 57) and optional 3.47:1 gearbox (Mod 63) K D RUSSELL
7	23/10/91	Introduction of Mainair 3 blade ground adjustable propeller and complete optional mods listing (Appendix 2). Introduction of Mainair WD propeller on Rotax 503-IV and Rotax 462 engines (Mod 62). K D RUSSELL
8	18/02/92	Approval of Mainair Modification No. 66 to incorporate duel electronic ignition on Upright Rotax 503 single carburetor engines. K D RUSSELL
9	01/02/93	Approval of Mainair Modification No. 70 (Electronic Starter Option). K D RUSSELL
10	10/12/93	Re-instatement of 60° bank angle limitations (SB No. 41 refers) K D RUSSELL
11	08/07/02	Update using new format J BARRATT
12	06/07/05	New company name J BARRATT
13	08/03/06	Correction to gearbox ratio for Rotax 582 J BARRATT

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<u>Issue No.</u>	<u>Reason and signatory</u>
14	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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10.55 mts SWU
2343.4 mm
183 mm
GCHINA FURSH 2 A.M.B - GF2A

OWNS NO. 99-44/GFA
TITLE GA - 44m/FM/Lp
DATE 15-11-87
SUPERCEDES
REF DATE
AMENDMENT

MKS DEFENS
F/A SERIES
TAME DEFENS
99-00 SERIES
99-44 SERIES
CORRECT FILE NAME
990 BURL
DEFENS

HEARNER SPORTS LTD
SHARLEIGH ROAD
LANCE - ENGLAND
TELEPHONE 01273 757575
SUNSHINE & SUNSHINE
SUNSHINE & SUNSHINE
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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>
7	Rear Seat Steering
11	503 Rotax Engine
12	462 Rotax Engine
12a	462 Fuel Heating
12b	462 Rotax engine/62" x 42" Square Tip propeller
12c	462 Rotax engine/62" x 44" Round Tip propeller
12d	462 Rotax engine/62" x 46" Round Tip propeller
16	Back-up wires on front strut
18	Transit Yoke
32	3-blade propeller on Gemini Flash, Flash 2, 2A and Scorcher
33	Short Reach Foot Steering Bar Gemini Flash 2A Dwg. 99-00-263
34	Aerofoil Side Strut Inner Grid Sleeve Dwg 44-305
35	Suspension Spring Rate Change
38	Rear Dip Pipe Locator Spring Dwg 99-00-303
39	Negative Load Wing Warning Sticker 00-02
40	Fibreglass exhaust shield Dwg 99-44-204
41	Q.D. Rear Steering, Alpha Trikes Dwg 44-141
42	Gas Damper Front Suspension, Alpha Trike Dwg 99-41-261
44	Additional monobolt fixing on Aerofoil Axles and additional sleeve on Drag Link
45	Boss Ballast Bag System Dwg 99-44-500
49	Alpha rear wheels ball race and axle
50	Flash Wing Over-rider Instructor Bars
51	Ear Bracket (Modified)
52	22 degree Steering
53	Nose Cone Warning Label
54	Rotax 503 Engine with Twin Carburetors and twin ignition
55	Radiator Top Mounting

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<u>Mainair</u> <u>Modification Number</u>	<u>Description</u>
56	Rotax 582 (40 Kw) Engine with Twin Carburettors and twin electronic ignition
57	Trailing Arm forks and suspension
60	Hand Throttle Lever
61	Fuel Tank Level graduations
62	Mainair <u>WD</u> ground adjustable propeller (Rotax 503 and 462)
63	3.47:1 Gearbox on Rotax 582
66	Dual Electronic ignition on Rotax 503 single carburetor engines
69	Wiring change to Rotax points ignition
70	Electronic starter options
71	Base Bar Moved Forwards 2 inches
72	Sealed Nose Wheel Bearings
90	Clear Fuel Filter
92	Sleeve in Drag Link
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 FLASH2A	
MAX. ALL UP WEIGHT	370KG
MIN. ALL UP WEIGHT	240KG
EMPTY WEIGHT	149KG
STALL SPEED	28MPH
NEVER EXCEED (V.N.E.)	89MPH
MIN LANDING APPROACH	42MPH
MAX CROSS WIND	10MPH
REC. ENGINE EGT	650 DEGC
REC ENGINE CHT	150 DEGC
REC. WATER TEMP	80DEGC
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)