

CIVIL AVIATION AUTHORITY

MICROLIGHT TYPE APPROVAL DATA SHEET (TADS)



**NO: BM 46 ISSUE: 14**

TYPE: PEGASUS QUANTUM 15 – (Rotax 2 stroke engines)

- (1) MANUFACTURER: P & M Aviation Ltd, Unit B, Crawford St, Rochdale, Lancs. OL16 5NU.
- (2) UK IMPORTER: N/A
- (3) CERTIFICATION: BCAR section S issue 2
- (4) DEFINITION OF BASIC STANDARD: Cyclone Airports Ltd Modification Submission PG308 (Certification of Pegasus Quantum 15 at 409kg AUW)
- (5) COMPLIANCE WITH THE MICROLIGHT DEFINITION
- |     |  |  |
|-----|--|--|
| (a) | MTOW   | i) 390kg.<br>ii) 409kg following mods in appendix A. |
| (b) | No. Seats  | 2  |
| (c) | Maximum Wing Loading   | 15.9kg/m <sup>2</sup>                                |
| (d) | V <sub>so</sub>  | 38mph CAS  |
| (e) | Permitted range of pilot weights                                       | 55-90 kg front seat.<br>0-90 kg rear seat.           |
|     | With modification M122   | 55-100 kg front seat.<br>0-100 kg rear seat.         |
|     | With modifications M122 & M150   | 55-110 kg front seat<br>0-110 kg rear seat           |
|     | Total maximum crew weight  | 200 kg   |
| (f) | Typical Empty Weight (ZFW)   | 160-198Kg  |
| (g) | ZFW + 172 kg crew + 1 hr fuel<br>(18litres /13 kg)                     | 345-383Kg  |
| (h) | ZFW + 86 kg pilot + full fuel<br>( 47.4litres /34 kg)                  | 280-318Kg  |
|     | ZFW + 86 kg pilot + full fuel<br>(65 litres / 47 kg)                   | 293-331Kg  |
| (i) | Max ZFW at initial permit issue<br>(Subject to an approved mod. state) | 220Kg  |

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**(6) POWER PLANTS**

Designation	503-2v	503-2v	503-2v	503-1v	462 hp
Engine Type	2 cylinder fan cooled 2 stroke	2 cylinder fan cooled 2 stroke	2 cylinder fan cooled 2 stroke	2 cylinder fan cooled 2 stroke	2 cylinder liquid cooled 2 stroke
Reduction Gear	3.47:1 C type gearbox	3.47:1 E type gearbox	2.58:1 B type gearbox	2.58:1 B type gearbox	2.58:1B type gearbox
Exhaust System	Rotax side mounted with Rotax after muffler	Rotax side mounted with Rotax after muffler	Rotax side mounted with Rotax after muffler	Rotax side mounted with Rotax after muffler	Rotax side mounted with Rotax after muffler
Intake System	Rotax intake silencer+K&N intake filter	Rotax intake silencer+K&N intake filter	Rotax intake silencer+K&N intake filter	Rotax intake silencer+K&N intake filter	Rotax single carb Intake silencer +K&N intake filter
Propeller Type	Arplast 166	Arplast 166	Ivoprop 2 blade 65"	Ivoprop 2 blade 65"	Arplast 162
Propeller Dia x Pitch	166cm, 18° at 53.5 cm radius	166cm, 18° at 53.5 cm radius	165cm (65"), 12° at the tip, 6200 rpm static	165cm (65"), 11° at the tip, 6200 rpm static	162cm, 18° at 53.5 cm radius
Noise Type Cert No.	147m Issue 8	147m Issue 8	147m issue 8	147m issue 8	147m Issue 8
AAN approving configuration	AAN23996 Issue 2	<b>Pegasus Mod PG31 &amp; AAN23996 Issue 2</b>	<b>Pegasus Mod PG47 &amp; AAN23996 Issue 2 Addendum 3 and Issue 4</b>	<b>Pegasus Mod PG357 &amp; AAN28130</b>	<b>Pegasus Mod SW115 &amp; AAN23996 addendum 2</b>

Designation	582/40	582/40	582/48	582/48
Engine Type	2 cylinder liquid cooled 2 stroke	2 cylinder liquid cooled 2 stroke	2 cylinder liquid cooled 2 stroke	2 cylinder liquid cooled 2 stroke
Reduction Gear	3.47:1 C type gearbox	3.47:1 E type gearbox	3.47:1 C type gearbox	3.47:1 E type gearbox
Exhaust System	Rotax side mounted with Rotax after muffler	Rotax side mounted with Rotax after muffler	Rotax side mounted with Rotax after muffler	Rotax side mounted with Rotax after muffler
Intake System	Cyclone intake silencer+K&N intake filter	Cyclone intake silencer+K&N intake filter	Cyclone intake silencer+K&N intake filter	Cyclone intake silencer+K&N intake filter
Propeller Type	Arplast 166	Arplast 166	Arplast 166	Arplast 166
Propeller Dia x Pitch	166cm, 19° at 53.5 cm radius	166cm, 19° at 53.5 cm radius	166cm, 21° at 53.5 cm radius	166cm, 21° at 53.5 cm radius
Noise Type Cert No.	147m Issue 8	147m Issue 8	147m Issue 9	147m Issue 9
AAN approving configuration	<b>Pegasus Mod SW113 &amp; AAN23996 addendum 1</b>	<b>Pegasus Mod PG30 &amp; AAN23996 addendum 1</b>	<b>Pegasus Mod SW113 &amp; AAN23996 addendum 1</b>	<b>Pegasus Mod PG30 &amp; AAN23996 addendum 1</b>

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(7) MANDATORY LIMITATIONS:

(A) Max Take-Off Weight	i) 390kg ii) With the modifications detailed in appendix A, 409kg		
(B) CG Limits	<i>N/A not critical.</i> <i>Flexwing with defined hang point position on keel.</i>		
(C) CG datum	Nosewheel axle.		
(D) Cockpit Loadings (solo front seat only)	Front	Rear	Total
	Min 55kg	0	55kg
	Max 90kg (100kg <sup>1</sup> ) (110kg <sup>2</sup> )	90kg (100kg <sup>1</sup> ) (110kg <sup>2</sup> )	180kg (200kg <sup>1</sup> ) (200kg <sup>2</sup> )
(E) Never Exceed Speed	90mph		
(F) Manoeuvring Speed	60mph		
(G) Permitted Manoeuvres	45° Nose up / 45° nose down Non Aerobatic, max bank 60° Normal acceleration Flight limits, +3.8 / -0g		
(H) Fuel Contents (Max Useable)	47.4L		
(I) Contents (Max Useable) Mod M130/1	65L		

<sup>1</sup> With modification M122 incorporated.

<sup>2</sup> With modifications M122 *and* M150 incorporated.

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(J) Power Plant See Table

Engine	Rotax 503 – 2v Rotax 503-1v	Rotax 582/40 Rotax 582/48 Rotax 462hp		
Max RPM	6800max 5min. 6500 contin.	6800max 5min. 6500 contin		
MAX CHT	250°C	150°C		
MAX EGT	650°C	650°C		
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	N/A	Rotary valve Skew Gear: Synthetic or semi synthetic 2 stroke oil		
Gearbox oil spec	API-GL5 or GL6,SAE 140EP or 85 W-140EP	API-GL5 or GL6,SAE 140EP or 85 W-140EP		
Fuel/Oil Mix	Synthetic or semi synthetic 2 stroke premix engine oil, 50:1	Synthetic or semi synthetic 2 stroke premix engine oil, 50:1		
Coolant Temperature	N/A	80°C		
Oil Pressure	N/A	N/A		
Oil Temperature	N/A	N/A		
Fuel Pressure	0.4-0.15 bar	0.4-0.15 bar		

\*Unleaded preferred. See flight manual for limitations on AVGAS.

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(8) INSTRUMENTS REQUIRED:

ASI	Altimeter	RPM	CHT	Compass	Coolant temp	Fuel Pressure	VSI	Slip ball
Required (0-100mph.)	Required 0-20,000 ft	0-7500	0-300°C for 503 Engine	Optional	0-200°C for LC engines	Optional	Optional	N/A 2 axis control

(9) CONTROL DEFLECTIONS:

N/A weight shift control limits defined by structure geometry.

- Control bar move right = roll left
- Control bar push out = pitch up
- Tighten trim cable = slow trim
- Push left pedal = taxi steering right
- Push left toe = brakes on
- Push right toe = throttle open
- Hand throttle forward = throttle open
- Ignition switches up = switch on
- Choke forward = choke on
- Tap aligned with body = fuel on

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

10.1 Manuals approved for use with this aircraft.

- (a) Pegasus Quantum 15 Operator's manual current at aircraft production date, now at Issue 9 or amended, covering all current production Rotax 582, 503, 912 and HKS engine variants.
- (b) Pegasus Quantum 15 operator's manual ref SW-406-19, covering out-of-production Rotax 462 engine variant.
- (c) Rotax 503, 582 or 462 engine Operator's manual/maintenance manual.
- (d) Supplement M130 (for 65L tank mod)

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)

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

See Annex D.

(d) Switches

See Annex D.

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

See Annex A for required modifications.

Annual Bettsometer test with a 1.2mm diameter needle, with wing sails fitted and tensioned enough to prevent puckering of sailcloth at the needle, is to be carried out in accordance with Service Bulletin 133 issue 3.

Applied loads:

Upper & lower surface: 1360 grammes, for wings with Yellow Aramid Reinforcement.

Or

Upper & lower surface: 1000 grammes, for wings with Black Technora reinforcement.

Loads to be applied spanwise and chordwise.

Stitches: 1360 grammes using a 1.2mm diameter hook, pull at 90deg to surface of tensioned sail.

Annual Brooksmeter test after first 2 years, using Brooksmeter, on untensioned wing trailing edge is to be carried out in accordance with Service Bulletin 132 issue 4.

Applied loads:

Aramid X-05 Yellow sail reinforcement: 9kgf

or

Technora Black sail reinforcement: 8kgf

(12) MINIMUM PERFORMANCE AT MAX TAKE-OFF WEIGHT

(All up weight of the 2.58:1 gearbox variants is self-limited by approved equipment fit with maximum fuel and cockpit load)

Rate of Climb:

Rotax 462, 2.58:1 gearbox	550 fpm at 45mph IAS, 390kg AUW
Rotax 503-1v, 2.58:1 gearbox	468 fpm at 45mph IAS ,390kgAUW
Rotax 503-2v, 2.58:1 gearbox	530 fpm at 45mph IAS, 390kgAUW
Rotax 503-2v, 3.47:1 gearbox	500 fpm at 45mph IAS , 409kg AUW
Rotax 582/40	650 fpm at 45mph IAS, 409kg AUW
Rotax 582/48	833 fpm at 45mph IAS, 409kg AUW

Stall or Minimum Flying Speed: 33mph IAS at MTOW / idle.

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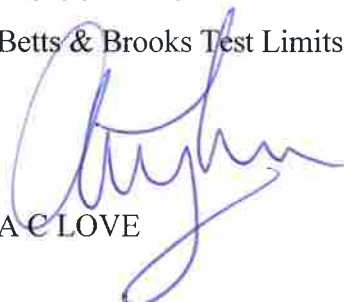
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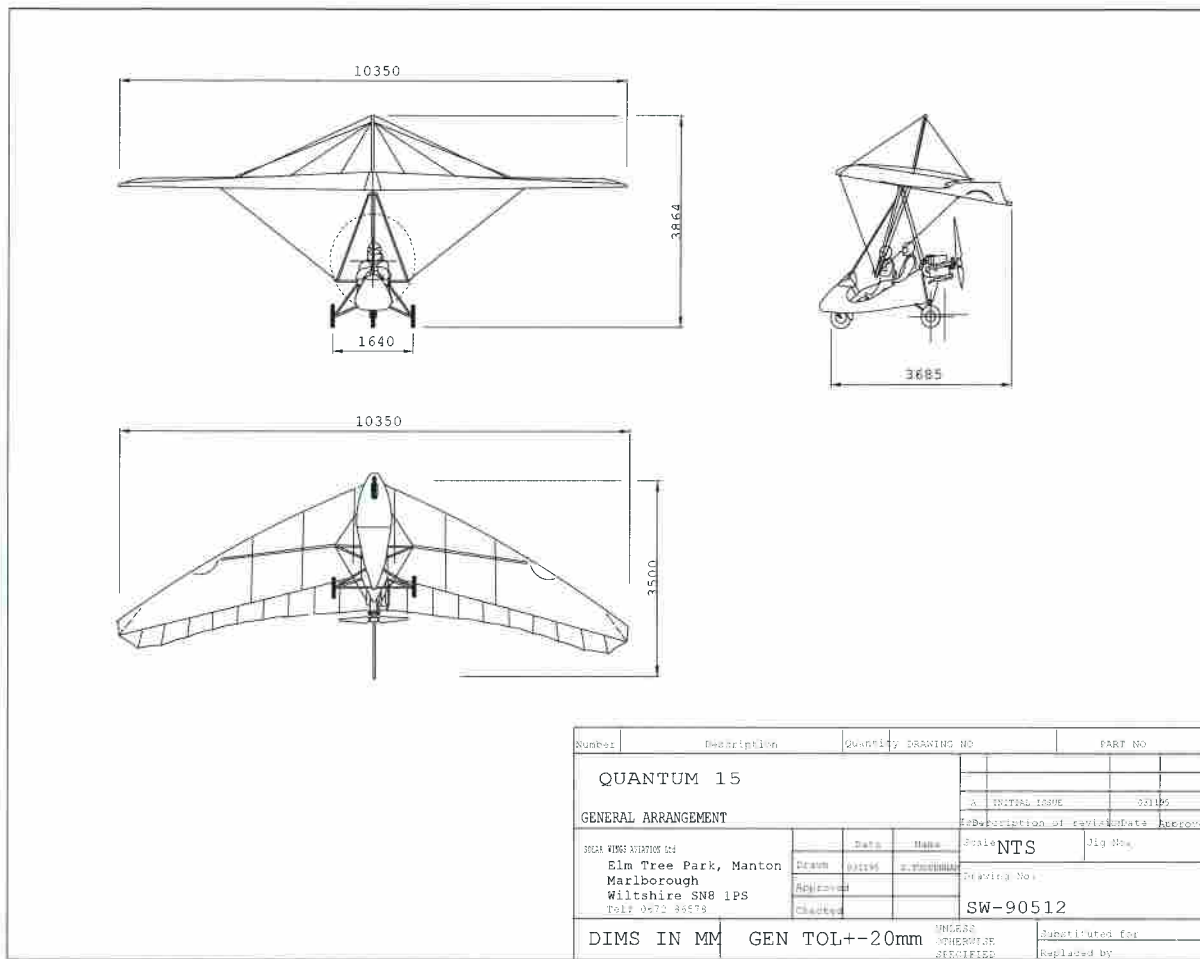
Issue History

<u>Issue No.</u>	<u>Reason and signatory</u>
1	01/08/93 Initial Issue A M CARTER
2	00/11/93 Incorporate Rotax 462 and 582 engine variants (Mods 113 and 115) K D RUSSELL
3	31/03/95 To reflect approval of Electric Start Modification No.s PG30 and PG31 K D RUSSELL
4	13/08/96 To revise empty weights R J HARDY
5	15/01/97 To incorporate Quantum 15 503-2V Basic model 647 R J HARDY
6	27/04/01 New format, increase MAUW to 409kg R J HARDY
7	27/11/01 390kg or 409kg MAUW dependant on mod. status. Introduction of Rotax 503-1v R J HARDY
8	01/04/03 New manufacturer, Mainair Sports Ltd. J C BARRATT
9	19/06/03 Introduction of Rotax 582/48 J C BARRATT
10	13/10/04 Raise seat weight limit to 100kg per seat J C BARRATT
11	31/03/05 Mod M130: 65L tank, telescopic front suspension and rising rate rear suspension J C BARRATT
12	06/07/05 New company name J C BARRATT
13	06/11/07 Raise seat weight limit to 110kg per seat D S CORTIZO
14	18/03/15 Betts & Brooks Test Limits Amended & General Update

  
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Illustration of Aircraft - 3 View





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ANNEX A – MANDATORY MODIFICATIONS/SERVICE BULLETINS

SB or Mod.	Issue date	Description.
SB082	08/12/95	Rear undercarriage Loctite.
SB083	13/12/95	Luff line pulley on s/n 7104 to 7122
SB084	18/09/96	Inspection of root stitching (superseded by mod. PG 138)
SB085	06/11/96	TIG welded front fork trailing links
SB086	20/05/97	Inspection of swages
SB088	15/09/97	Inspection of trim bridle
SB089	17/09/97	Over centre pin movement
SB090	17/09/97	Roll bearing bolt security
SB091	06/04/98	Roll bearing flange cracking
SB094	18/06/98	Use of AVGAS
SB095	30/07/98	Seat belt buckle on s/n 7428-7456
SB097	17/08/98	Q2 tip webbing stitching
SB100	01/11/00	Fuel tank strap
SB105	17/07/01	Pylon fretting
SB106	17/07/01	Luffline pulley rivet up to S/N 7838
SB109	21/03/02	Component life extension
SB126	30/06/09	Front Strut Top Channel
SB132	18/06/13	Brookstesting

**CAA Mandatory modifications:**

PG207	27/08/98	Q2 tip webbing attachment & protection
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**Cyclone Airports compulsory modifications for operation at 409kg:**

PG138	07/11/97	Trailing edge wing root retention webbing
PG173	17/03/98	Roll bracket flange thickened
PG124	22/05/97	10mm Leading Edge bolts
PG73	10/05/96	Bronze weld change to TIG weld on front fork links

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ANNEX B - APPROVED OPTIONAL MODIFICATIONS

SW121	Instructor Training Bars With Swinging Links
PG177	LTS Reed Switch Type Fuel Gauge.
M101	Fitting Of High Power Exhaust To Convert 582/40 To 582/48 Engine
M103	Aerofoil Suspension Struts
M108	Disk Brakes
M122	Seat Weight Limit Raised To 100kg Per Occupant (Nb Seat Frame Tubes Must Be Upated From 16swg To 13swg Wall Gauge, Part No. SW-90490)
M130/1	65L Fuel Tank
M130/2	Telescopic Damper Front Suspension
M130/3	Rising Rate Rear Suspension
M137	Low Drag Panniers
M139	Keel CG Hole Bush
M140	Keel Nose Holes Bush (Std. Repair)
M141	Cross Boom End Hole Bush (Std. Repair)
M142	Leading Edge Font Bush (Std. Repair)
M148	Hang Point Bobbin
M150	110kg Per Seat
M152	Cranked Brake Pedal
M153	Landing Light
M157	Power Socket
M217	Stoneguard
M220	PX10 Leading Edge Material
M231	Dash Radio/Transponder/ELT
M232	Seat Belt Protection Sleeve
M234	Hand Controls
M236	Technora Strips
M242	Axle Mnt Aerial Bkt
M249	SuperB Battery
M250	UV (TNF215 or CB) Sailcloth
M282	Fournales Shocks

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.

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ANNEX C

WEIGHING INFORMATION

The table below is a guide only. Empty weights include unusable fuel, full oil, electrolyte and prepared ready for flight.

<b>ITEM WEIGHT kg</b>	
Basic model with 503-2v or 503-1v engine, 2.58:1 reduction gear, binnacle	160
Basic model with 503-2v engine, 2.58:1 reduction gear, pod	163
462 engine, 2.58:1 reduction gear, pod	167
503-2v engine, 3.47: reduction gear, pod	170
503-2v engine, 3.47: reduction gear, elec start, pod	174
582/40 engine, 3.47: reduction gear, pod	179
582/40 engine, 3.47: reduction gear, e/start, pod	183
Quantum 15-HKS	193
Quantum 15-912	200
Q2 wing only	50
<b>OPTIONAL ITEMS</b>	
VSI	0.35
TOURING SCREEN	0.25
REAR STEERING	1.05
3 HEAVY DUTY TYRES, ADD	1.72
MAP BOX-FABRIC	0.76
MAP BOX-COMPOSITE	1.49
DELUXE SEAT (1.150), ADD	0.46
50mm FRONT SEAT BOOSTER PAD	0.27
50mm FRONT S/BACK BOOSTER PAD ET	0.25
50mm REAR BOOSTER PAD	0.27
100mm REAR BOOSTER PAD	0.42
CONTROL BAR PROTECTION (2)	0.05
FRONT STRUT PROTECTION	0.04
LYNX ANTENNA	0.19
LYNX FILTER, POWER INT, PTT	0.81
INSTRUCTOR BARS	2.4
AEROTOW SYSTEM (912 ONLY)	1.5
13 SWG SEAT FRAME TUBES FOR 100KG/SEAT	0.5
MOD 130/1 65L TANK	0.5
MOD 130/2 TELESCOPIC FRONT SUSPENSION	0.5
MOD 130/3 RISING RATE REAR SUSPENSION	-0.1

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ANNEX D

EXAMPLE PLACARDS

