



TYPE: PEGASUS QUANTUM 15 - HKS

- (1) MANUFACTURER: Cyclone Airsports Ltd, no supported by P & M Aviation Ltd., Unit B, Crawford St, Rochdale, Lancashire OL16 5NU
- (2) UK IMPORTER: N/A
- (3) CERTIFICATION: BCAR section S issue 2
- (4) DEFINITION OF BASIC STANDARD: Cyclone Airsports Ltd Modification Submission PG308 (Certification of Pegasus Quantum 15 at 409kg AUW)
- (5) COMPLIANCE WITH THE MICROLIGHT DEFINITION

(a) MTOW	409 kg
(b) No. Seats	2
(c) Maximum Wing Loading	15.9kg/m ²
(d) V _{so}	38mph CAS
(e) Permitted range of pilot weights	55-90 kg front seat. 0-90 kg rear seat
With modification M122	55-100 kg front seat 0-100 kg rear seat
With modifications M122 & M150	55-110 kg front seat 0-110 kg rear seat
Total maximum crew weight	200Kg
(f) Typical ZFW	198Kg
(g) ZFW + 172 kg crew + 1 hr fuel (18litres /13 kg)	383Kg
(h) ZFW + 86 kg pilot + full fuel (47.4litres /34 kg)	318Kg
ZFW + 86 kg pilot + full fuel (65 litres / 47 kg)	331Kg
(i) Max ZFW at initial permit issue	220Kg

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(6) **POWER PLANTS**

Designation	<i>HKS 700E BETA</i>		
Engine Type	<i>2 cylinder 4 stroke</i>		
Reduction Gear	<i>3.47:1 gearbox</i>		
Exhaust System	<i>Cyclone underslung</i>		
Intake System	<i>K&N intake filter</i>		
Propeller Type	<i>Arplast Ecoprop 166/135/L/3</i>		
Propeller Dia x Pitch	<i>166cm, 23° at 53.5 cm radius</i>		
Noise Type Cert No.	<i>147m issue 6</i>		
AAN approving configuration	AAN26648 Issue 2		

(7) **MANDATORY LIMITATIONS:**

(A) Max Take-Off Weight	409kg		
(B) CG Limits	<i>N/A not critical. 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 ¹) (110kg ²)	90kg (100kg ¹) (110kg ²)	180kg (200kg ¹) (200kg ²)
(E) Never Exceed Speed	90mph		
(F) Manoeuvring Speed	60mph		

¹ With modification M122 incorporated.

² With modifications M122 & 150 incorporated.



- (G) Permitted Manoeuvres 45° Nose up / 45° nose down
 Non Aerobatic, max bank 60°
 Normal acceleration limits, +3.8 / -0g
- (H) Fuel Contents (Max Useable) 47.4L
- (H) Fuel (Max Useable mod. M130/1) 65L

(I) Power Plant See Table

Engine	HKS 700e beta			
Max RPM	6200max 5min. 5800 contin.			
MAX CHT	170°C			
MAX EGT	760°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	API SF or SG semi synthetic 4 stroke motorcycle engine oil.			
Gearbox oil spec	Common supply with engine			
Fuel/Oil Mix	N/A			
Coolant Temperature	N/A			
Oil Pressure	85psi min. at 6200 rpm			
Oil Temperature	50-90°C			
Fuel Pressure	0.4-0.15 bar			

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

(8) INSTRUMENTS REQUIRED:

ASI	Altimeter	RPM	CHT / EGT	Compass	Coolant temp	Fuel Pressure	Oil Pressure	Oil Temperature	VSI
Required (0-100 mph.)	Required 0-20,000 ft	0-6000	0-200°C 0-1000°C	Optional	Measured by CHT sensor	Optional	0 – 8Bar	0-150 DegC	Optional

(9) CONTROL DEFLECTIONS:

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



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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 issue 6
- (b) HKS 700e Beta Operator's manual/maintenance manual
- (c) Manual supplement M130 (for 65L tank)

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)

N/A limitations are programmed into electronic EIS instrument.

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

See Annex D.

(d) Switches

See Annex D.

(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 to flight is to be carried out to:

Upper & lower surface: 1360 grammes.

Stitches: 1360 grammes using a 1mm diameter hook, pull upwards.



(12) MINIMUM PERFORMANCE AT MAX TAKE-OFF WEIGHT

Rate of Climb: 550 fpm at 45mph IAS.

Stall or Minimum Flying Speed: 38mph IAS at MTOW / idle.

Issue History

<u>Issue No.</u>	<u>Reason and signatory</u>
1	17/08/98 Initial issue R J HARDY
2	12/10/98 To correct data on manufacturers advice R J HARDY
3	27/04/01 New format. Increase MAUW to 409kg R J HARDY
4	31/03/03 Change of manufacturer address J C BARRATT
5	13/10/04 Seat weight limit raised to 100kg/occupant with modification M122 J C BARRATT
6	31/03/05 Mod M130: 65L tank, telescopic nosegear suspension and rising rate rear suspension. J C BARRATT
7	06/07/05 New company name J C BARRATT
8	09/11/07 Raise seat weight limit to 110Kg per seat

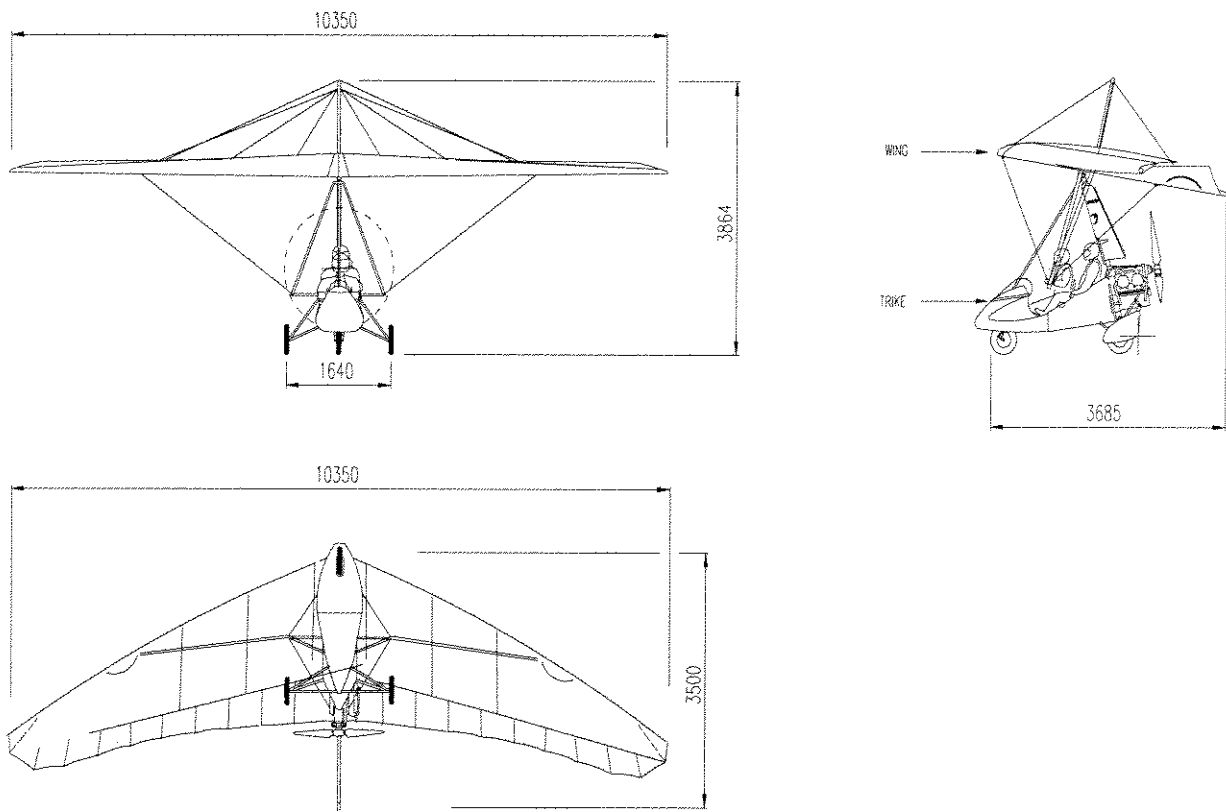

A J MAXWELL

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Illustration of Aircraft - 3 View





ANNEX A – MANDATORY MODIFICATIONS/SERVICE BULLETINS

SB or Mod.	Issue date	Description.
SB 0082	08/12/95	Rear undercarriage Loctite.
SB 0083	13/12/95	Luff line pulley on s/n 7104 to 7122
SB 0084	18/9/96	Inspection of root stitching (superceded by mod. PG 138)
SB 0085	06/11/96	TIG welded front fork trailing links
SB 0086	20/05/97	Inspection of swages
SB 0088	15/09/97	Inspection of trim bridle
SB0089	17/09/97	Over centre pin movement
SB0090	17/09/97	Roll bearing bolt security
SB0091	06/04/98	Roll bearing flange cracking
SB0094	18/06/98	Use of AVGAS
SB0095	30/07/98	Seat belt buckle on s/n 7428-7456
SB0097	17/08/98	Q2 tip webbing stitching
SB0100	01/11/00	Fuel tank strap
SB0105	17/07/01	Pylon fretting
SB0106	17/07/01	Luffline pulley rivet up to S/N 7838
SB 0109	21/03/02	Component life extension
SB0118	02/09/04	Oil suction hose wirelocking

CAA Mandatory modifications:

PG207 27/08/98 Q2 tip webbing attachment & protection

Cyclone Airsports 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

ANNEX B - APPROVED OPTIONAL MODIFICATIONS

SW121 Instructor training bars with swinging links
 Contact Cyclone Airsports Ltd for further information.
 M103 Aerofoil suspension struts
 M108 Disk brakes
 M122 Seat weight limit raised to 100kg/occupant
 (nb seat frame must be uprated from 16swg to 13swg, part SW-90490)
 M130/1 65L fuel tank
 M130/2 Telescopic damper front suspension
 M130/3 Rising rate rear suspension
 M137 Low drag panniers
 M140 Keel nose holes bush (Std. Repair)



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M141	Cross boom end hole bush (Std. Repair)
M142	Leading edge front bush (Std. Repair)
M148	Hang point bobbin
M150	110kg per seat
M152	Cranked brake pedal
M153	Landing light

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.

ANNEX C

WEIGHING INFORMATION

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

ITEM WEIGHT kg	
Basic model with 503-2v 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

OPTIONAL ITEMS	
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
13swg seat frame tubes, modification M122	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

MAINAIR SPORTS
ROCHDALE LANCS
017088 885134
MODEL

FLIGHT LIMITATIONS
MAXIMUM AVAILABLE PAYLOAD:

P1 kg
PASSENGER kg
TOTAL kg

MINIMUM PAYLOAD kg
DO NOT EXCEED THE
UNWEIGHTED SPEED
DO NOT PITCH MORE DOWN OR
MORE UP MORE THAN
DEGREE FROM HORIZONTAL OR
EXCEED (00) DEGREES
ANGLE OF BANK

WARNING
THIS AIRCRAFT IS NON-AUTOMATIC
NO ROLLOVERS, STALLS, WINGS,
TAILLICKS, LOOPS, ROLLS
OR SPIES
NO NEGATIVE G
MAINTAIN POSITIVE 'G' LOADING
AT ALL TIMES

AIRCRAFT WEIGHTS
EMPTY WEIGHT kg
MAXIMUM TAKE OFF
WEIGHT kg
AIRCRAFT SERIAL No.

FLY BOLD FROM FRONT SEAT ONLY

DP-050

COLOUR - BLACK ON SILVER

DP-076 MIXTURE CONTROL
50
RICH MIXTURE LEAN
80G G MAX

DP-051
45
USEABLE FUEL CAPACITY LITRES
RECOMMENDED FUEL
95+ OCTANE UNLEADED/
97 OCTANE 4 STAR
AVGAS 100LL
SEE FLIGHT MANUAL

DP-052
45
USEABLE FUEL CAPACITY LITRES
MIXTURE 80:1 MT10
RECOMMENDED FUEL
95+OCTANE (UNLEADED)/
97 OCTANE 4 STAR
NON DETERGENT TWO
STROKE OIL TO BE USED

DP-075 FUEL LOAD PLACARD (ALL)
50
EMPTY WEIGHT FOR EMPTY LUGS TO BE FUL L
FULL (3/4) (1/2) (1/4)

DP-053
45
BAGGAGE HERE
MAX WEIGHT 12.5 kg

DP-054
20
IGN ON
IGN OFF
OUT Ø 14

DP-057 FUEL LOAD PLACARD
16
35
OIL TYPE API-SF OR SG 10W-40
QUANTITY 8 LTRS

DP-077 OIL TYPE & QTY PLACARD
15.000
50
WITH 2 X 88KG PILOTS
MAX FUEL KG

SW-90314

SHEET 1 of 4 - MAIN PLACARDS

PLACARDS		Date	Issue	Scale	NTS	J/g No.
J	MAINAIR MANUF.	28304	WGB			
I	DP075 ADDED	211102	WGB			
H	DP077 & 8 ADDED	111102	WGB			
G	DP075 ADDED	25602	WGB			
F	DP072 ADDED	5401	WGB			
E	DP0-067 ADDED	14197				
D	WELD TEST					
C	COMMON PLACARD	030598				
B	QUANTITIES/12					
Iss: Description of revs		Date	Approved			
Mainair Sports Ltd Unit B, Crawford St Rochdale Lancs, OL16 8AA, UK TEL: 017088 885134		Drawn: 110888 Approved: 110888 Checked: 110888	R. GOODWIN	Drawing No. SW-90314		
DIM IN MM		GEN TOL +/- 1		UNLESS OTHERWISE SPECIFIED		
				Substituted for Replaced by		