

SECTION 6

WEIGHT & BALANCE / EQUIPMENT LIST

TABLE OF CONTENTS

INTRODUCTION	2
AIRCRAFT WEIGHING PROCEDURES.....	2
WEIGHING REPORT	3
WEIGHT AND BALANCE	5
LOADING	9
EQUIPMENT LIST	9

INTRODUCTION

This section describes the procedure for establishing the basic empty weight and moment of the aircraft. Loading procedure information is also provided.

AIRCRAFT WEIGHING PROCEDURES

PREPARATION

- a. Carry out weighing procedure inside closed hangar
- b. Remove from cabin any objects left unintentionally
- a. Insure on board presence of:
 - Flight manual, airnavigation certificate, navigation charts etc.
- d. Align nose wheel
- e. Drain fuel via specific drain valve.
- f. Oil, hydraulic fluid and coolant to operating levels
- g. Move sliding seats to most forward position
- h. Raise flaps to fully retracted position (0°)
- i. Place control surfaces in neutral position
- j. Place scales (min. capacity 150 kg) under each wheel

LEVELING

- a. Level the aircraft using the cabin floor as datum
- b. Center bubble on level by deflating nose tire

WEIGHING

- a. Record weight shown on each scale
- b. Repeat weighing procedure three times
- c. Calculate empty weight

DETERMINATION OF C.G. LOCATION

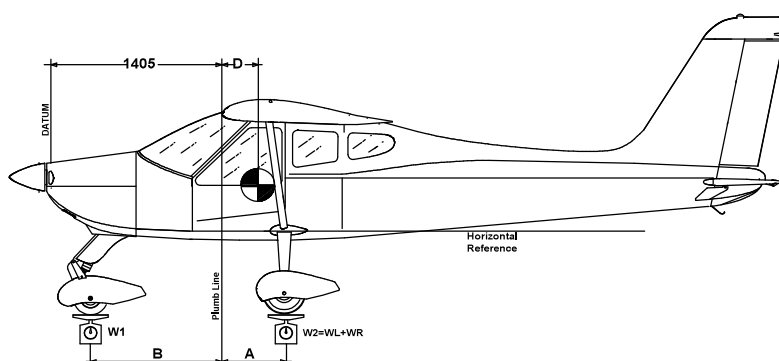
- a. Drop a plumb bob tangent to the leading edge (in non-tapered area of one half-wing, approximately one meter from wing root) and trace reference mark on the floor.
- b. Repeat operation for other half-wing.
- c. Stretch a taught line between the two marks
- d. Measure the distance between the reference line and main wheel axis
- e. Using recorded data it is possible to determine the aircraft's C.G. location and moment (see following table)

WEIGHING REPORT

Model **P92-JS** S/N: _____ Weighing n° _____

Date: _____

Datum: Propeller support flange w/o spacer. –Equipment list, date: _____
MAC: 1400 mm



	<i>Kg</i>		<i>meters</i>
Nose wheel weight	$W_1 =$	Plumb bob distance LH wheel	$A_L =$
LH wheel weight	$W_L =$	Plumb bob distance RH wheel	$A_R =$
RH wheel weight	$W_R =$	Average distance $(A_L + A_R)/2$	$A =$
$W_2 = W_L + W_R =$		Bob distance from nose wheel	$B =$

Empty weight ⁽¹⁾ $W_e = W_1 + W_2 =$ _____

$D = \frac{W_2 \cdot A - W_1 \cdot B}{W_e} =$ _____ <i>m</i>	$D\% = \frac{D}{1.4} \cdot 100 =$ _____
--	---

Empty weight moment: $M = [(D+1.405) \cdot W_e] =$ _____ *Kg · m*

Maximum takeoff weight	$W_T = 550 \text{ kg}$	$W_T = 600 \text{ kg}$
Empty weight	$W_e =$	$W_e =$
Maximum payload $W_T - W_e$	$W_u =$	$W_u =$

Sign: _____

1 - Including unusable fuel (2.3 kg).

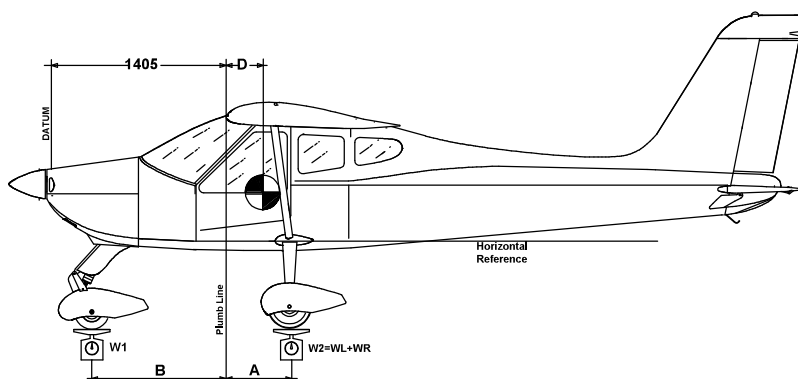
WEIGHING REPORT

Model **P92-JS** S/N: _____ Weighing n° _____

Date: _____

Datum: Propeller support flange w/o spacer. –Equipment list, date: _____

MAC: 1400 mm



	Kg		meters
Nose wheel weight	$W_1 =$	Plumb bob distance LH wheel	$A_L =$
LH wheel weight	$W_L =$	Plumb bob distance RH wheel	$A_R =$
RH wheel weight	$W_R =$	Average distance $(A_L + A_R)/2$	$A =$
$W_2 = W_L + W_R =$		Bob distance from nose wheel	$B =$

Empty weight ⁽¹⁾ $W_e = W_1 + W_2 =$ _____

$D = \frac{W_2 \cdot A - W_1 \cdot B}{W_e} =$ _____ m	$D\% = \frac{D}{1.4} \cdot 100 =$ _____
---	---

Empty weight moment: $M = [(D+1.405) \cdot W_e] =$ _____ Kg . m

Maximum takeoff weight	$W_T = 550 \text{ kg}$	$W_T = 600 \text{ kg}$
Empty weight	$W_e =$ _____	$W_e =$ _____
Maximum payload $W_T - W_e$	$W_u =$ _____	$W_u =$ _____

Sign: _____

1 - Including unusable fuel (2.3 kg).

WEIGHT AND BALANCE

To determine the aircraft's CG location and to verify that the CG falls within the predetermined CG travel range, it is necessary to use the chart in the following page. Chart reports CG location as a function of the empty weight moment with respect to the datum as yielded by weighing report.

USE OF “WEIGHT & BALANCE” CHART (page 6-6)

In order to use the graph it is necessary to know the value of the moment arm with respect to the datum. Once this value is found on the abscissa, a parallel to the oblique lines is drawn until it intersects the ordinate relative to the weight of pilot and passenger. From this point, a new line is drawn horizontally up to limit value of 180 kg and, from here, a parallel to the oblique lines is drawn until it intersects with the abscissa relative to fuel weight carried on board. A horizontal line is then drawn through this point up to limit value of 70 liters and a new parallel to the oblique lines is drawn until abscissa is intercepted relative to baggage loaded on board behind the seats. Another horizontal line is drawn and it is thus possible to verify that the intersection of this segment with the vertical abscissa relative to the aircraft's takeoff total weight falls within the shaded area which represents the admissible CG range as a function of total weight.

Pages 6 and 7 show charts of CG travel as a function of aircraft weight, distances in meters of pilots and baggage from datum (propeller support flange) is also provided.

EXAMPLE (see page 6-6)

Empty weight moment = 562 *kg·m*

Pilot and passenger = 160 *kg*

Fuel = 50 *Lit*

Baggage = 15 *kg*

Takeoff weight = 536 *kg*

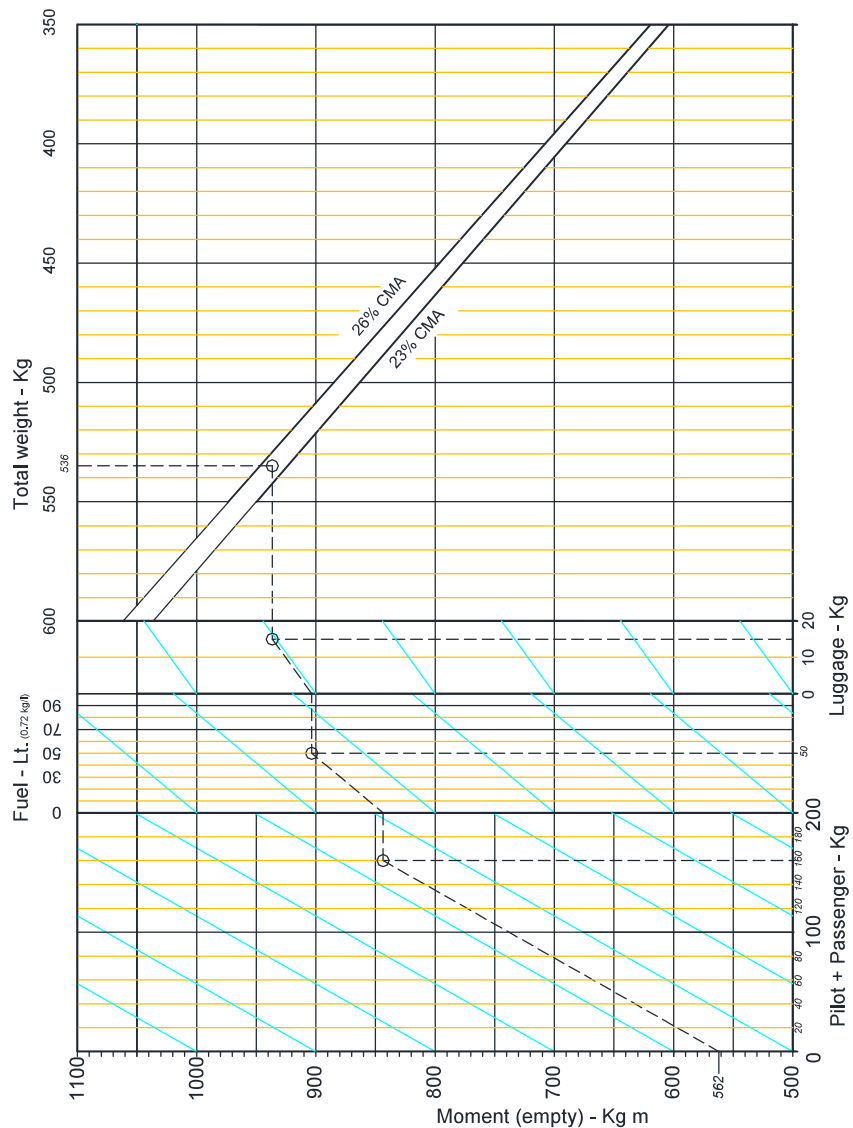


Fig. 6-1 Weight & balance chart

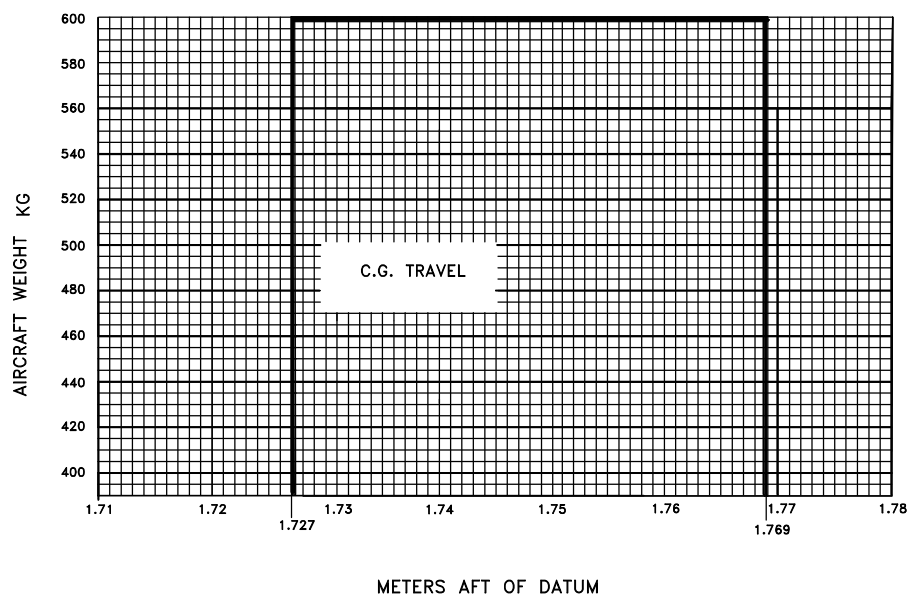


Fig 6-2. C.G. RANGE CHART.

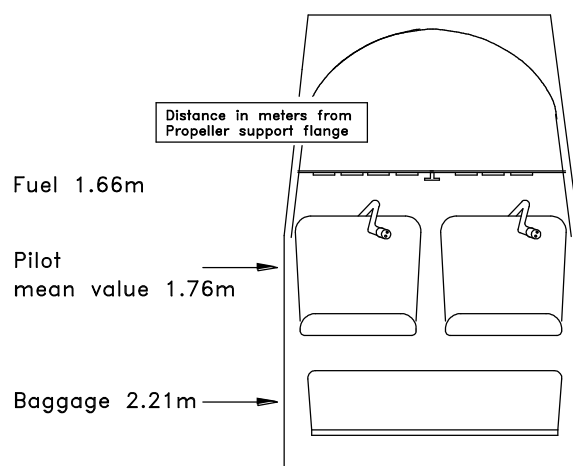


Fig 6-3. LOAD POSITION WITH RESPECT TO DATUM

LOADING

Baggage compartment is designed for a maximum load of 20 kg. Baggage size shall prevent excessive loading of utility shelf (maximum pressure 12.5 kg/dm²). Maximum baggage size is: 80x45x32 cm. Baggage shall be secured using a tie-down net to prevent any baggage movement during maneuvers.

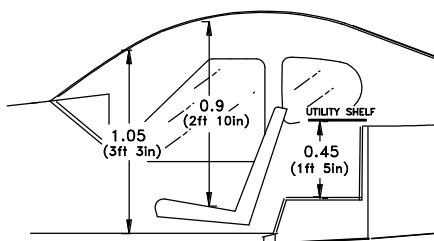


Fig 6-4. CABIN DIMENSIONS

EQUIPMENT LIST

The following is a comprehensive list of all TECNAM supplied equipment for the P92-JS. The list consists of the following groups:

- A - Engine and accessories
- B - Landing gear
- C - Electrical system
- D - Instruments
- E - Avionics

the following information describes each listing:

- Part-number to uniquely identify the item type.
- Item description
- Serial number
- Weight in kilograms
- Distance in meters from datum

NOTE

Items marked with an asterisk () are part of basic installation. Additionally, further equipment marked with X in the Inst. column are installed on the aircraft S/N in subject.*

EQUIPMENT LIST		A/C S/N	DATE:	
REF.	DESCRIPTION & P/N	INST	WEIGHT kg	DATUM m
ENGINE & ACCESSORIES				
A1	Engine Rotax 912S2 - p/n 309.120.133	*	59.0	0.32
A2	Prop. HOFFMANN p/n HO17GHM A 174 177C	*	4.50	-0.08
A3	Exhaust and manifolds – p/n SSB-978-480-CC	*	4.50	0.55
A4	Heat exchanger - p/n 92-11-830	*	2.00	0.55
A5	Oil Reservoir (full) - p/n 956.137 or 656.865	*	4.00	0.61
A6	Oil radiator - p/n 886 025 or 886.033	*	0.40	0.07
A7	Liquid coolant radiator. - p/n 995.697 or 997.083	*	0.90	0.33
A8	Air filter K&N- p/n 33-2544	*	0.40	0.60
A9	Vacuum instr. system – RA215CC Rapco		3.00	0.25
A10	Vacuum valve RA2H3-12		0.100	0.71
A11	Fuel pump p/n 21-11-342-000	*	0.200	0.71
A12	Fuel tank. 45 Lt. P/N 21-1-340-001/2	*	//	//
LANDING GEAR AND ACCESSORIES				
B1	Main gear spring-leafs - p/n 92-8-300-1	*	5.700	1.930
B2	Main gear wheel rims. - CLEVELAND 40-78B or 199-102	*	2.050	1.930
B3	Main gear tires.-AIR TRAC 5.00-5	*	2.580	1.930
B4	Disk brakes - Cleveland 30-9 or 160-17	*	0.800	1.930
B5	Nose gear wheel rim p/n 92-8-880-1 or 92-8-700-000	*	1.300	0.310
B6	Nose gear tire - 4.00-6	N	1.200	0.460
B7	Nose gear tire – AIR TRACK 5.00-5		1.500	0.460
B8	Nose gear fairing p/n 92-8-410-1/2	N	1.500	0.460
B9	Nose gear fairing p/n 27-8-420-1		1.500	0.460
B10	Main gear fairing p/n 92-8-420-1/2	x	1.500	1.930
B11	Nose gear shock p/n 92-8-200-000	*	1.450	0.465

EQUIPMENT LIST		A/C S/N	DATE:	
REF.	DESCRIPTION & P/N	INST	WEIGHT <i>kg</i>	DATUM <i>m</i>
	<i>ELECTRICAL SYSTEM</i>			
C1	Battery FIAMM 6H4P 12V 18Ah		6.00	4.24
C2	Regulator, rectifier - p/n 945.345	*	0.20	0.82
C3	Battery relay - p/n 111-226-5	*	0.30	4.19
C4	Flaps actuator - SIR Mod. AO-01/M	*	2.20	2.57
C5	Flaps actuator control switch – FEME MS35059-34	*	0.08	1.20
C6	Trim actuator control Ray Allen C. T2-10A	*	0.40	5.75
C7	Overvoltage sensor OS75-14		0.30	0.80
C8	Overvoltage sensor B00289-2	*	0.30	0.80
C9	Strobe light -, p/n 2005	N	0.15	5.52
C10	Navigation lights - AS W1285	N	0.15	2.30
C11	Nav-Strobe light - AVE-WPTSG-54G		0.25	2.30
C12	Stall warning AS 164R or TECNAM 21-9-420-000	*	0.10	1.95
C13	Landing light - AS GE 4509		0.50	1.50
C14	Landing light – Pled1L		0.60	1.50
C15	BATTERY SPARK 500		4.9	4.24
	<i>INSTRUMENTS</i>			
D1	Altimeter - – MIKROTECHINA p/n 1128.12B6 -		0.39	1.20
D2	Altimeter – United Instruments p/n 5934PM-3		0.39	1.20
D3	Airspeed ind. – MIKROTECHINA 116.B0B2	*	0.30	1.20
D4	Compass – Airpath C2400 L4P	*	0.29	1.20
D5	Clock – DAVTRON mod. M 800	*	0.15	1.20
D6	Vertical Speed Indicator – MIKROTECHINA UL 30-42.2		0.35	1.20
D7	Vertical Speed Indicator – Wultrad Inc. p/n		0.35	1.20

EQUIPMENT LIST		A/C S/N	DATE:	
REF.	DESCRIPTION & P/N	INST	WEIGHT <i>kg</i>	DATUM <i>m</i>
	BC-2A			
D8	Turn and Bank Indicator – FALCON GAUGER TC02E-3-2		0.56	1.20
D9	Turn and Bank Indicator – Mid. Continent. p/n 1394T100-TZ		0.56	1.20
D10	Attitude Indicator – FALCON G.- GH02V-3		1.10	1.20
D11	Attitude Indicator – RCA ALLEN INSTR. RCA 22-7		1.10	1.20
D12	Directional Gyro – RCA ALLEN INSTR. RCA 11A-8		1.10	1.20
D13	Directional Gyro – FALCON G.- DG02V-3		1.10	1.20
D14	OAT Indicator –397035001G VDO	*	0.05	1.20
D15	Head temp. Ind. 641-011-7047/-7048 VDO	N	0.10	1.20
D16	Head temp. Ind. SOR 53 or SOR 59	*	0.10	1.20
D17	Oil temp. ind. – VDO 644-001-7030	N	0.10	1.20
D18	Oil temp. ind SOR 54	*	0.10	1.20
D19	Vacuum instr. UMA Inc. 3-200-12	*	0.10	1.20
D20	Prop. RPM Ind. D1-112-5040 Aircraft Mitchell.	N	1.10	1.20
D21	Prop. RPM Ind. Sorlini (SOR52)	*	1.10	1.20
D22	Fuel level Ind. Road XID4.0008.00	*	0.56	1.20
D23	Oil pressure. Ind. – Sorlini (SOR50, SOR50V)		0.10	1.20
	<i>AVIONICS AND OTHER</i>			
E1	Nav/CommTrans.-Bendix/King, KX155		2.24	1.20
E2	Nav Indicator – Bendix/King KI208		0.46	1.20
E3	R/T VHF COMM Garmin SL40		1.20	1.20
E4	Transponder – Bendix/King KT76A		1.36	1.20
E5	Receiver GPS/NAV e r/t COM GNS 430W		2.31	1.20
E6	R/T VHF COMM IC-A200 ICOM		1.20	1.20
E7	ELT ARTEX ME 406		1.10	2.70

EQUIPMENT LIST		A/C S/N	DATE:	
REF.	DESCRIPTION & P/N	INST	WEIGHT <i>kg</i>	DATUM <i>m</i>
E8	Transponder-Garmin GTX328 or GTX335		1.00	1.20
E9	Audio panel –Garmin GMA 340 or 345		0.50	1.20
E10	Vor/Loc Indicator –Garmin GI106()		0.64	1.20
E11	Antenna KA 92 GPS		0.27	1.07
E12	Antenna Transp.-Bendix/King KA60		0.35	1.50
E13	Antenna GPS – Garmin 1012		0.17	1.07
E14	Microphone – Telex TRA 100		0.17	1.90
E15	Antenna Garmin GA35		0.27	1.08
E16	Antenna Comm CI 291 or CI 121	*	0.34	3.30
E17	Antenna VOR/ILS CI 138C or CI 158C		0.26	5.60
E18	Antenna ELT		0.21	2.70
E19	Fire extinguisher Fire fighting Enterprises Ltd BA51015-3		2.20	2.16
E20	Fire extinguisher – HALON H3G 1301 or AMEREX A344		1.00	2.16
E21	First Aid Kit	*	0.28	2.60
E22	Altitude Encoder – Amery King A30		0.56	1.00
E23	ADF Receiver – Bendix King KR87		1.38	1.20
E24	ADF Indicator – Bendix King KI227		0.39	1.20
E25	ADF Antenna – Bendix King KA44B		1.89	2.05
E26	GTN 650		3.20	1.20
E27	GTR225A		1.07	1.20
E28	GNC 255 or 255A		1.36	1.20
E29	ELT ACK E04 or Kannad Compact / Integra		1.00	2.70
E30	Transponder Antenna CI 105		0.11	1.50
E31	Antenna Marker CI102		0.27	2.70

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