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6 Weight and Balance

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6.1 Introduction

This Section includes Weight and Balance Record of empty airplane, Permitted Payload Range within which the airplane may be safely operated, and a method to determine whether the operational weight and CG location will be within the permitted limits range.

Procedure for weighing the airplane and the calculation method for establishing the permitted payload range are contained in the Airplane Maintenance Manual for SportStar RTC.



6.4 Operational Weight and Balance Computation

CAUTION

THE AIRPLANE PILOT IS RESPONSIBLE FOR AN APPROPRIATE LOADING OF THE AIRPLANE. AT LOADING THE AIRPLANE, THE WEIGHT LIMITATIONS SHOWN IN PARAGRAPH 2.7 MUST NOT BE EXCEEDED AND C.G. POSITION OF THE AIRPLANE MUST LIE WITHIN THE ENVELOPE - SEE PARA 2.8.

6.4.1 Computation Procedure

1. Record into the Airplane Loading Schedule Chart (para 6.5) current empty weight and static moment of the airplane, which you read from the table Weight and Balance Record (para 6.2).
2. Record the weight of crew, fuel, and baggage into the Airplane Loading Schedule Chart (para 6.5).
3. See the Table of Static Moments (para 6.6) or Airplane Loading Graph (para 6.7) to read static moments for given weights of crew, fuel, and baggage.
4. Record found moments into the Airplane Loading Schedule Chart (para 6.5).
5. Determine Take-off weight of the airplane – add together the airplane empty weight, crew, fuel, and baggage and record the result into the Loading Schedule Chart (para 6.5).
6. Check, whether the calculated Take-off weight does not exceed Airplane Maximum Take-off Weight 600 kg. If yes, then it is necessary to reduce weight of some of the useful load items (fuel, baggage).

WARNING

DO NOT EXCEED MAXIMUM WEIGHTS AND LIMITATION OF CENTER OF GRAVITY! THEIR EXCEEDING LEADS TO AIRPLANE OVERLOADING AND TO DEGRADATION OF FLIGHT CHARACTERISTICS AND DETERIORATION OF MANOEUVRABILITY.

7. Determine Total Static Moment of loaded airplane – add together the static moment of empty airplane, crew, fuel, and baggage and record the result into the Loading Schedule Chart (para 6.5).



8. Plot Takeoff Weight and Total Static Moment into the SportStar RTC airplane CG Moment Envelope (para 6.8).
9. Check, whether the intersection of Take-off weight horizontal line and Total Static Moment vertical line is inside the envelope.
If **YES**, then the flight may be safely performed as regards weight and balance.
If **NOT**, then it is necessary to change weight of some of the useful load items (crew, fuel, baggage) and perform the computation again.

WARNING

SAFETY OF FLIGHT PERFORMED WITH THE AIRPLANE LOADED OUTSIDE PERMITTED LIMITS OF WEIGHT AND STATIC MOMENTS MAY BE DETERIORATED!

6.5 Airplane Loading Schedule Chart

Type / model:	SportStar RTC	Serial No:	2023 2230	Registration:	SE-MMJ	
Loading Schedule Chart			Sample Airplane		Your Airplane	
No.	Item	Arm (m)	Weight (kg)	Moment (kg.m)	Weight (kg)	Moment (kg.m)
1.	Empty airplane	-	325	81,3	364.4	96.4
2.	Crew	0.545	150	81,8		
3.	Baggage (Max. 25 kg)	1.083	10	10,8		
4.	Fuel (Max. 120 L)	0.680	36	24,5		
5.	Take-off weight = Sum of weights 1 - 4 (MTOW 600 kg) Total moment = Sum of moments 1 - 4		521	198,3		



6.6 Table of Static Moments

Crew	
Weight (kg)	Moment (kg.m)
0	0
50	27.3
60	32.7
70	38.2
80	43.6
90	49.1
100	54.5
110	60.0
120	65.4
130	70.9
140	76.3
150	81.8
160	87.2
170	92.7
180	98.1
190	103.6
200	109.0
210	114.5
220	119.9

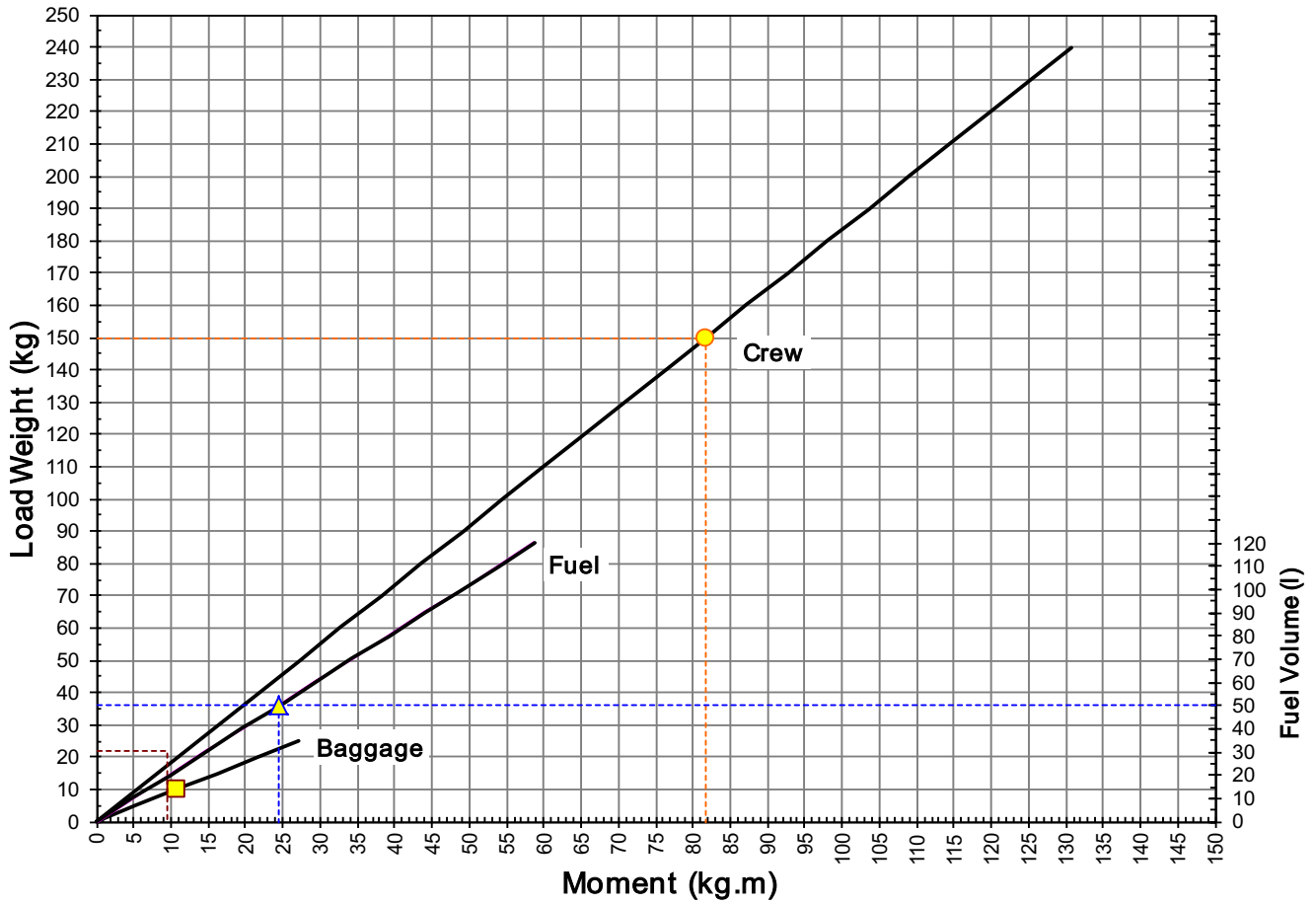
Baggage	
Weight (kg)	Moment (kg.m)
0	0
5	5.4
10	10.8
15	16.2
20	21.7
25	27.1



Fuel		
Fuel volume (l)	Weight (kg)	Moment (kg.m)
0	0	0
10	7.2	4.9
20	14.4	9.8
30	21.6	14.7
40	28.8	19.6
50	36.0	24.5
60	43.2	29.4
70	50.4	34.3
80	57.6	39.2
90	64.8	44.1
100	72.0	49.0
110	79.2	53.9
120	86.4	58.8

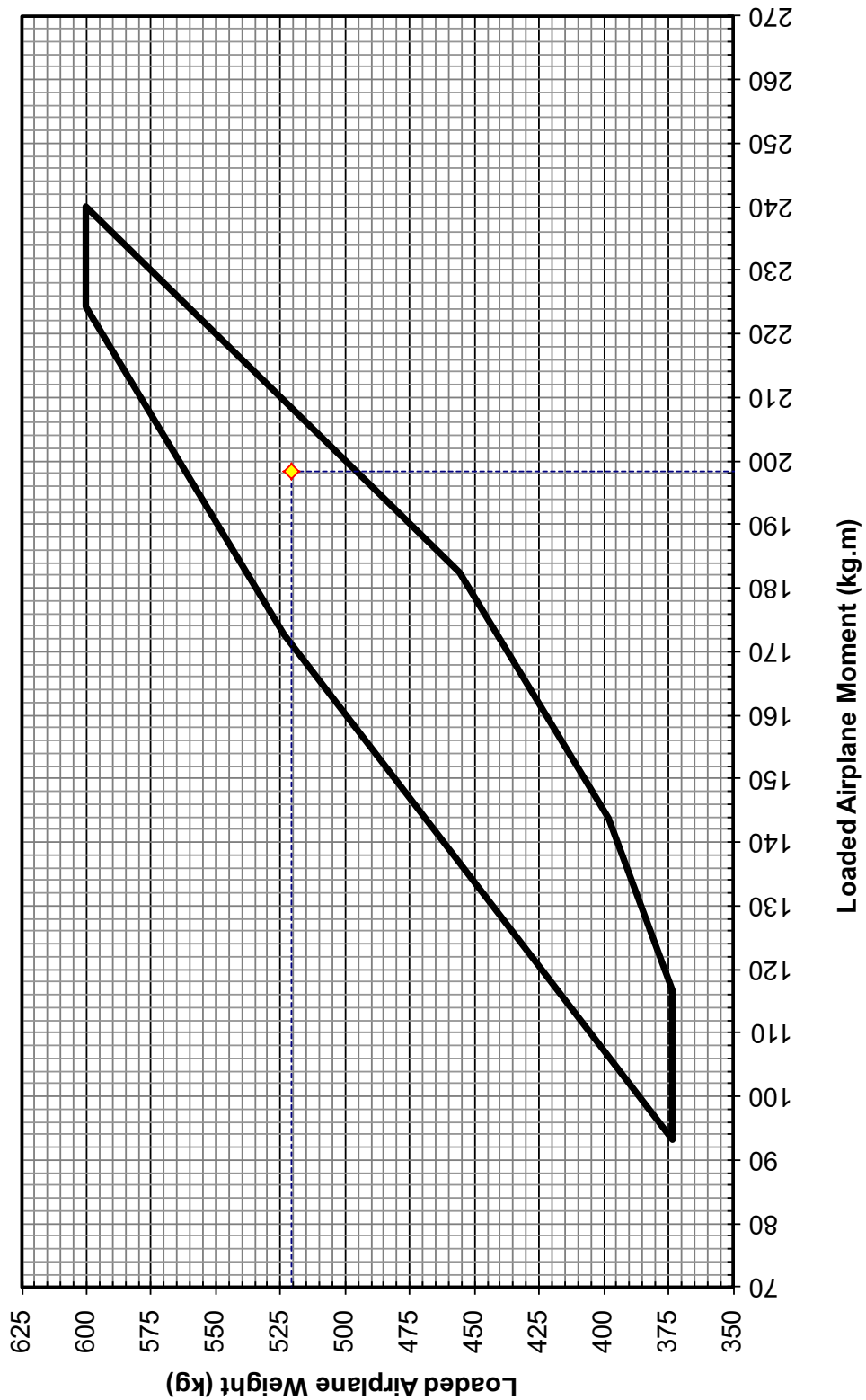


6.7 Airplane Loading Graph





6.8 CG Moment Envelope of SportStar RTC Airplane





6.9 Equipment List

The equipment list is located in Supplement in Section 9 of this POH.