

TABLE OF CONTENTS

	INTRODUCTION.	i
SECTION I.	EQUIPMENT LIST AND CORRECTED EMPTY WEIGHT DATA	1-1
	EQUIPMENT CHECKLIST	1-2
	EQUIPMENT INSTALLED OR REMOVED AFTER BASIC WEIGHT & BALANCE.	1-3
	CORRECTED EMPTY WEIGHT AS DELIVERED	1-3
SECTION II.	PILOTS LOADING GUIDE	2-1
	LOADING CALCULATION PROCEDURE.	2-1
	PROBLEM FORM.	2-2
	LOADING COMPUTATION GRAPH	2-3
	CENTER-OF-GRAVITY MOMENT ENVELOPE	2-3
SECTION III.	OWNERS WEIGHT & BALANCE RECORD.	3-1
	CORRECTED EMPTY WEIGHT & MOMENT (CG).	3-1

INTRODUCTION

The FAA charges you, the aircraft owner or pilot, with the responsibility of properly loading your aircraft for safe flight. Data presented in this document will enable you to carry out this responsibility and insure that your airplane is loaded to operate within the prescribed weight and center-of-gravity limitations.

FAA regulations also require that any change in the original equipment affecting the empty weight center of gravity be recorded in the Aircraft Log Book. A form for maintaining a permanent record of all such changes is provided on page 3-1. This form, if properly maintained, will enable you to determine the current weight-and-balance status of the airplane for load scheduling. The weight-and-balance data entered as your aircraft left the factory, plus the record you maintain on page 3-1, is all of the data needed to compute loading schedules.

The maximum certificated gross weight for the Model M20E under all operating conditions is 2575 pounds. Maximum useful load is determined by subtracting the corrected aircraft empty weight from its maximum gross weight. The aircraft must be operated strictly within the limits of the Center-of-Gravity Moment Envelope shown on page 2-3.

WEIGHT & BALANCE RECORD

MODEL M20E

SECTION I. EQUIPMENT LIST AND CORRECTED EMPTY WEIGHT DATA

EQUIPMENT CHECKLIST

The equipment checked below was factory installed and is included in the original or basic empty weight of the aircraft.

FAA Registration No. _____

M20E Serial No. _____

		DATE INSPECTED			
MO					
DAY					
YR.					

FED. A/C SPEC. 2A3 ITEM NO.	ITEM DESCRIPTION	WEIGHT	ARM	MARK ITEMS INSTALLED			
04	Constant-Speed Propeller Hartzell Hub (HC-C2YK-1) with (7666-2) Blades	53.75	- 30.16	x			
	Hartzell Spinner (835-20)	3.25	- 29.18	x			
	Edo Aire Governor	2.75	+ 3.60	x			
101	Fuel Pumps:						
	Engine Driven, AC	1.60	+ 1.20	x			
	Electric, Dukes	1.91	+ 12.50	x			
102	Oil Radiator, Stewart War.	2.40	- 18.00	x			
103	Induction Air Filter, Don.	1.20	- 19.50	x			
104	Starter, Prestolite	17.80	- 18.00	x			
201	Main Wheel & Brake Assys	15.40		x			
202	Main Wheel Tires (6.00 x 6)	17.00		x			
205	Nose Wheel (5.00 x 5)	2.60	- .3	x			
206	Nose Wheel Tire & Tube	7.00	- .3	x			
301	Alternator, 60 AMP	10.30	- 19.50	x			
302	Battery, 35 AMP HR	28.10	+105.80	x			
303	Voltage Regulator, (Oeco)	1.44	+ 7.00	x			
601	Stall Warning Indicator	.07	+ 50.00	x			
	Gear Warning Indicator	.12	+ 50.00	x			
602	Vacuum System	6.35	- 2.65	x			
	Instruments:						
	Horizon Gyro	2.00	+ 21.60				
	Directional Gyro	2.82	+ 21.70				
	Clock	.40	+ 24.75				
	Gage OAT	.40	+ 24.5				
	Indicator Rate-of-Climb	1.00	+ 22.30				
	Turn Coordinator	2.90	+ 21.50	x			
	Cigarette Lighter	.20	+ 21.00	x			

MODEL M20E

DATE
INSPECTED

MO

DAY

YR.

REvised 4/74

MODEL M20E

M20E Serial No. _____

ITEM NO.	ITEM DESCRIPTION	WEIGHT	ARM	MOMENT
	Oil (2 GAL)	-15.00	- 6.50	+ 97.50
	Fuel (Full)		48.43	
X	Weight and Moment Added or Subtracted		X	

	WEIGHT	ARM	MOMENT	USEFUL LOAD
Aircraft Empty Weight as Weighed				
Weight Added or Subtracted				
Corrected Empty Weight and CG (Gear Extended) as Deliv- ered From Factory				

Transfer these figures to page 3-1.

SECTION II. PILOTS LOADING GUIDE**LOADING CALCULATION PROCEDURE**

Proper loading of the aircraft is essential for maximum flight performance and safety. This section will assist you in determining whether the aircraft loading schedule is within the approved weight and center-of-gravity limits.

To figure an actual loading problem for your aircraft, proceed as follows:

- Step 1. Refer to the latest entry on page 3-1 for the current empty weight and moment.

NOTE: Since the engine oil is normally kept at the full level, use the oil weight and moment figures shown in the sample problems as constants in calculating all loading problems.

- Step 2. Note the pilot's weight and the position his seat will occupy in flight. Find this weight on the left scale of the Loading Computation Graph (page 2-3) and cross the graph horizontally to the point representing the pilot's seat position between the FWD and AFT position lines on the graph for #1 and #2 seats. When this point is located, drop down to the bottom scale to find the value of the moment/1000 due to the pilot's weight and seat position.

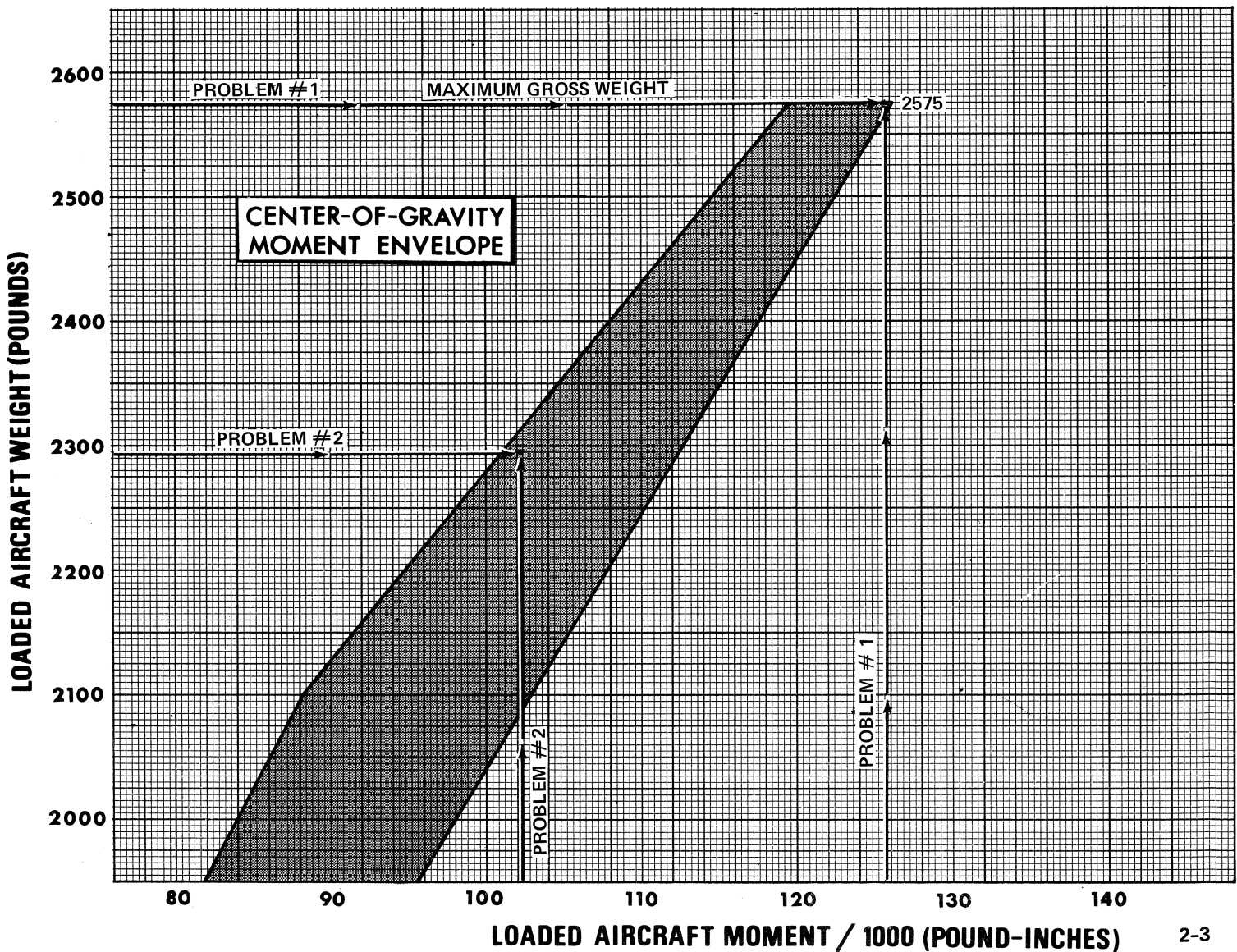
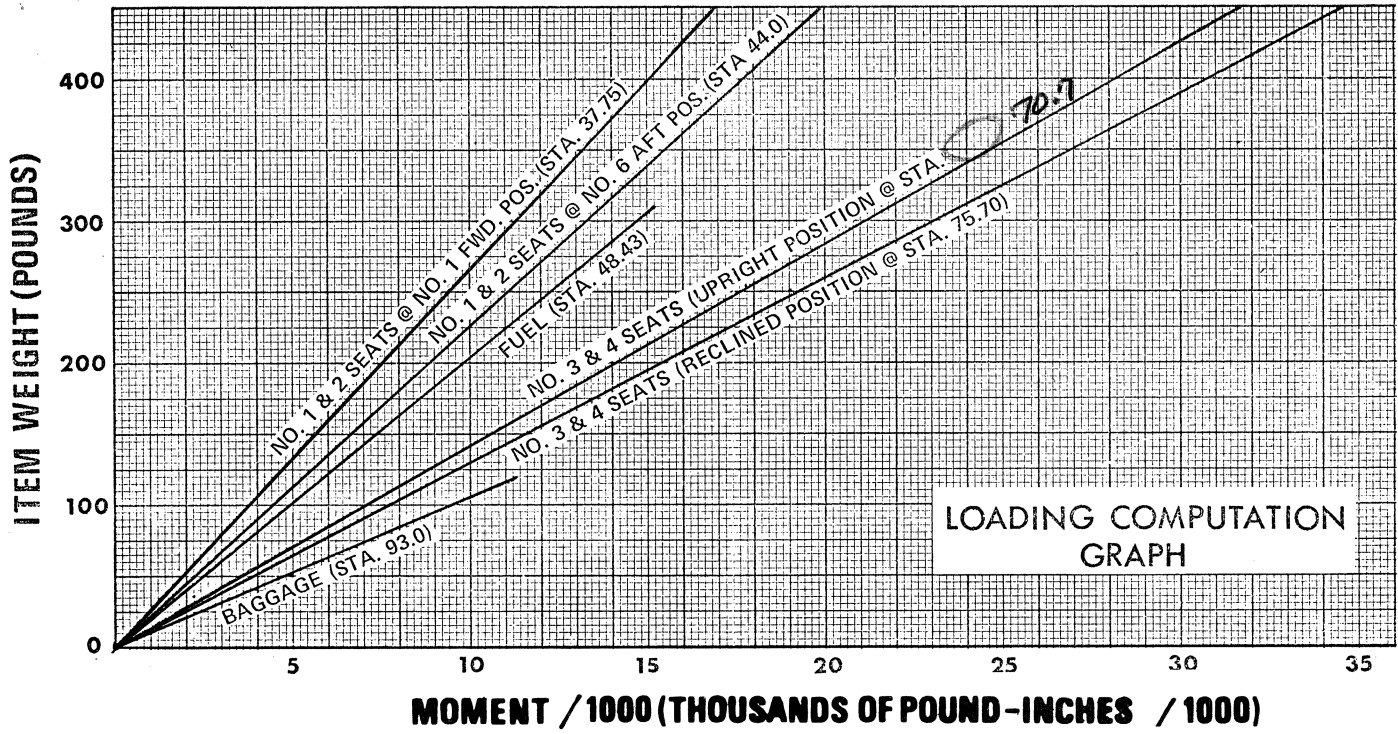
Repeat the procedure for the copilot and enter these weights and moment/1000 values in the proper subcolumns in the Problem Form on page 2-2.

- Step 3. Proceed as in Step 2 to account for the passengers in seats 3 and 4. Enter the weight and value of moment/1000 in the proper columns.
- Step 4. Again proceed as in Step 2 to account for the amount of fuel carried, and enter the weight and moment/1000 values in the proper columns.
- Step 5. Once more proceed as in Step 2 to account for the baggage to be carried and enter the figures in the proper columns.
- Step 6. Total the weight columns. This total must be 2575 pounds or less. Total the Moment/1000 column. Do not forget to subtract negative numbers.
- Step 7. Refer to the Center-of-Gravity Moment Envelope (page 2-3). Locate the loaded weight of your airplane on the left scale of the graph and trace a line horizontally to the right. Locate the total moment/1000 value for your airplane on the bottom scale of the graph and trace a line vertically above this point until the horizontal line for weight is intersected. If the point of intersection is within the shaded area, your aircraft loading is acceptable. If the point of intersection falls outside the shaded area, you must rearrange the load before takeoff.

MODEL M20E

PROBLEM FORM		FAA REGISTRATION NO.		M20E SERIAL NO.			
STEP	ITEM	SAMPLE PROBLEM #1 PILOT & THREE PASS.		SAMPLE PROBLEM #2 PILOT & ONE PASS.		YOUR PROBLEM	
		WEIGHT (POUNDS)	MOMENT 1000	WEIGHT (POUNDS)	MOMENT 1000	WEIGHT (POUNDS)	MOMENT 1000
1	Current Aircraft Empty Weight (From Page 3-1)	1600.0	72.96	1600.0	72.96		
	Oil-- 8 QT @ 1.875 LBS/QT (Sump assumed full for all flights)	15.0	.11	15.0	.11		
2	Pilot Seat (#1)*	170.0	6.42 (Fwd. Pos.)	170.0	6.42		
	Co-Pilot Seat (#2)*	170.0	6.42 (Fwd. Pos.)	197.0	7.68 (2nd Pos.)		
3	Left Rear Seat (#3)	170.0	12.02 (Unreclined)	--	--		
	Right Rear Seat (#4)	170.0	12.02 (Unreclined)	--	--		
4	Fuel (No. GAL x 6 LBS/GAL) (MAX 52 GAL, 312 LBS)	220.0	10.65	312.0	15.11		
5	Baggage (MAX 120 LBS)	60.0	5.58	--	--		
	Hat Rack (MAX 10 LBS)	--	--	--	--		
6	Loaded Aircraft Weight	2575.0		2294.0			
	Total Moment/1000		125.96		102.06		
7	Refer to page 2-3, Center-of-Gravity Envelope, to determine whether your aircraft loading is acceptable. (The hat rack arm station is 114.0; the fuel arm station is 48.43; and the oil arm station is -6.50)						
*Obtain the moment/1000 value for each seat position (FWD, MID, or AFT.) from page 2-3.							

WEIGHT & BALANCE RECORD
MODEL M20E



WEIGHT & BALANCE RECORD

MODEL M20E

SECTION III. OWNERS WEIGHT & BALANCE RECORD**CORRECTED EMPTY WEIGHT & MOMENT (CG)**

Enter below all weight change data from the Aircraft Log Book.

FAA Registration No. _____

M20E Serial No. _____

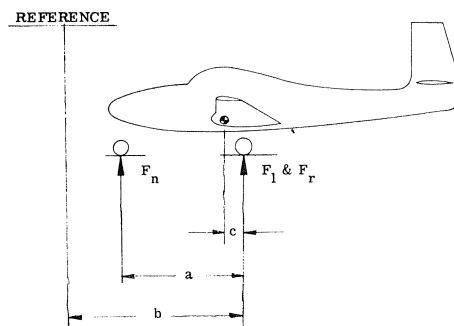
EMPTY WEIGHT	ARM	<u>MOMENT</u> 1000	USEFUL LOAD	DATE AND SOURCE OF INFORMATION

MOONEY CORPORATION
Engineering Flight Test

WEIGHT AND BALANCE

MODEL _____ SERIAL NUMBER _____ DATE _____

LOADED AS FOLLOWS



(F_r) Weight - Right Main Wheel = _____ lbs.

(F_l) Weight - Left Main Wheel = _____ lbs.

(F_n) Weight - Nose Wheel = _____ lbs.

(F_t) Total Weight of Aircraft = LBS

(a) Distance - Nose Wheel C to Main Wheel C = _____ inches

(b) Distance - Reference to Main Wheel C = _____ inches

(c) C.G. Location = $\frac{(F_n)(a)}{(F_t)}$ = $\frac{(\quad)(\quad)}{(\quad)}$

inches from
main wheels

= _____

(d) Fuselage Station of Reference = _____ inches

Fuselage Station of C.G. = (b) - (c) + (d) = _____ inches

= % MAC