

FAA APPROVED
A I R P L A N E F L I G H T M A N U A L

MAULE AIRCRAFT CORPORATION
MOULTREE, GEORGIA

Model M-5-210C

Airplane Serial No. _____

FAA Registration No. _____

(THIS DOCUMENT MUST BE KEPT IN THE AIRPLANE AT ALL TIMES)

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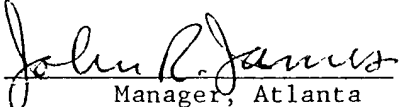

Chief, Engineering and Manufacturing Branch
Southern Region, FAA

DATE: 28 Dec 73

AIRPLANE FLIGHT MANUAL

MAULE M-5-210C

LOG OF REVISIONS

REV.	TO PAGES	DESCRIPTION	APPROVAL AND DATE
A	1	Corrected Normal Operating Range to Cylinder Head Temperature to read 200° - 460°F.	 Manager, Atlanta Aircraft Certification Office, FAA, Central Region Date: <u>FEB 3 1983</u>
B	4a	Added " <u>PREFLIGHT INSPECTION</u> " to II PROCEDURES.	 Manager, Atlanta Aircraft Certification Office FAA, Central Region Date: <u>May 1, 1984</u>

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LOG OF SUPPLEMENTS

SUPP. NO.	NO. OF PAGES	DESCRIPTION	APPROVAL DATE
1	2	Installation of EDO 248A2440 or 248B2440 Floats - Maule Dwg 9080A .	06/27/74
2	3	Installation of FluidDyne C2200H - Maule drawing 9021F .	04/02/75
-	3	Installation of Pee Kay 2300 Floats .	03/02/77
4	2	Installation of 20°/40° Flap Ratchet <u>and</u> 2500# upgross modification.	04/01/83
5	2	Installation of 20°/40° Flap Ratchet Maule p/n 3207B.	03/11/83
6	5	Installation of Fli-Lite 3000 MK IIIA Skis - Maule drawing 9079A .	02/04/83
-	3	Installation of Aqua 2400 Floats .	07/20/77
7	8	Inst. of EDO 248B2440 Floats @ 2500# GW - Maule Dwg 9173A .	12/08/98
8	2	Installation of Continental IO-360-A engine - Maule Mod Kit No. 19.	11/19/96
-	2	Operation of aircraft when M-5 Wing Assemblies 2110X-30 (with 2167X Main Fuel Tanks) are installed - Maule Modification Kit No. 15 .	10/08/96
9	2	Flight operation with either one (not both) of the Front Doors removed .	10/26/98
10	6	Inst. of S-TEC System 55 Two Axis Autopilot ST-620 (14v) - Maule Drawing 9196A . (Land)	04/04/00
11	6	Inst. of S-TEC System 55 Two Axis Autopilot ST-620 (14v) - Maule Drawing 9196A . (Sea)	04/04/00
12	9	Inst. of S-TEC System 50 Two Axis Autopilot ST-418-50 (14v) - Maule Drawing 9193A .	01/05/00
13	9	Inst. of S-TEC System 30 Two Axis Autopilot ST-810-30 (14v) - Maule Drawing 9197A . (Land)	01/21/00
14	9	Inst. of S-TEC System 30 Two Axis Autopilot ST-810-30 (14v) - Maule Drawing 9197A . (Sea)	01/21/00
15	7	Inst. of S-TEC System 40 Single Axis Autopilot ST-418-40 (14v) - Maule Drawing 9193A .	10/29/01
16	9	Inst. of S-TEC System 20 Single Axis Autopilot ST-810-20 (14v) - Maule Drawing 9197A . (Land)	03/20/00
17	9	Inst. of S-TEC System 20 Single Axis Autopilot ST-810-20 (14v) - Maule Drawing 9197A . (Sea)	03/20/00
-	5	Installation of Apollo MX20 Multi-Function Display - Maule Drawing 7265A .	08/15/02
-	8	Installation of GARMIN GNC-420 (GPS/COMM) System - Maule Drawing 7251A .	06/30/03
-	9	Inst. of GARMIN GNS-530 (GPS/NAV/COMM) System - Maule Drawing 7253A .	06/30/03
-	4	Inst. of GARMIN GTX-330 Mode S Transponder Traffic Information System (TIS) - Maule Drawing 7255A .	06/30/03
-	3	Installation of Aqua 2200 Floats @ 2300# - STC-SA00758CH.	09/18/97
-	3	Operation of aircraft when a 5th passenger Seat is installed in rear cabin - Maule Modification Kit No. 8 .	09/02/97
19	9	Operation of aircraft when M-7A Wing Assembly 2140X-41/-49/-53/-56, 3212F-30 Rudder and 3240F Flap Operating System are installed - Maule Mod Kit No. 69 .	05/12/08
-	3	Operation of aircraft when Micro AeroDynamics Vortex Generator System is installed per Maule Drawing 9177A .	12/16/05
20	20	Installation of Wipline 2350 Amphibious Floats - Maule Drawing 9178A .	11/21/11

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I. LIMITATIONS

The following limitations must be observed in the operation of this Airplane:

A. Engine	Continental Model IO-360-D
B. Engine Limit	210 H.P. @ 2800 RPM All operations
C. Fuel	100-130 Minimum Grade Aviation Gasoline
D. Propeller	McCauley D2A34C67N/S76C-2
E. Power Plant Instruments:	
Cylinder Head Temp	Green Arc: 200° F - 460° F (Normal Operating Range) Red Radial: 460° F
Manifold Pressure	No required markings
Oil Temperature	Green Arc: 75 - 240° F (Normal Operating Range) Red Radial: 240° F
Oil Pressure	Green Arc: 30 - 60 psi (Normal Operating Range) Yellow Arc (Caution): 10 - 30 psi Red Radials: 10 and 60 psi
Tachometer	Green Arc: 1800 - 2800 RPM (Normal Operating Range) Red Radial: 2800 RPM

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F. Airspeed Limits: (Calibrated Airspeed)

Never Exceed (V_{NE})	180 mph (156K) (Red Radial)
Caution Range	145 -180 mph (126 - 156K) (Yellow Arc)
Design Cruising Speed (V_C)	145 mph (126K)
Normal Operating Range	62 - 145 mph (54 - 126K) (Green Arc)
Max. Design Maneuvering Speed (V_P) (Maximum safe speed for application of full aerodynamic controls)	125 mph (109K)
Max. Flap Extension Speed (V_F)	94 mph (82K)
Flap Operating Range	56 - 94 mph (49 - 82K) (White Arc)

NOTE: Airspeed Instrument Markings and their significance:

- (a) Radial RED line marks the never exceed speed, which is the maximum safe airspeed.
- (b) YELLOW arc on indicator denotes range of speeds in which operations should be conducted with caution and only in smooth air.
- (c) GREEN arc denotes normal operating speed range; 62 mph (54K) CAS is stall speed with flaps up, power off at 2300 lbs.
- (d) WHITE arc denotes speed range in which flaps may be safely lowered; 56 mph (49K) CAS is stall speed with flaps 35°, power off at 2300 lbs.

G. MANEUVERS: Normal category maneuvers only are approved.

H. Flight Load Factors: (At max. gross weight of 2300 lbs.)

Maneuver: Positive Flaps Up	3.8g	Negative:	1.5g
Flaps Extended:	1.9g		

I. Maximum Weight 2300 lbs.

J. Center of Gravity Limits

	(+16.0) to (+20.5) at 2300 lbs.
	(+15.0) to (+20.5) at 2100 lbs.
	(+12.0) to (+20.5) at 1600 lbs. or less

Straight Line variation between points given
Datum: Wing Leading Edge

NOTE: It is the responsibility of the airplane owner and the pilot to insure that the airplane is properly loaded. Refer to Weight and Balance data for baggage/cargo loading.

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K. Placards:

"THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUAL."

"NO ACROBATIC MANEUVERS INCLUDING SPINS APPROVED."

"ROUGH AIR OR MANEUVERING SPEED: 125 MPH (109K)"

"SEE LOADING INSTRUCTIONS IN WEIGHT AND BALANCE SECTION OF AIRPLANE FLIGHT MANUAL."

Type of Operation Authorized:

"THIS AIRPLANE APPROVED FOR DAY OR NIGHT IFR NON-ICING FLIGHT WHEN EQUIPPED IN ACCORDANCE WITH FAR 91 OR FAR 135"

Fuel System Operation:

"FUEL REMAINING IN TANK WHEN INDICATOR READS ZERO CANNOT BE USED SAFELY IN FLIGHT."

Next to fuel filler caps:

MAIN (inboard) TANKS:

"FUEL - 100/130 OCTANE - 21.5 GAL" (20 gal useable each tank)

AUXILIARY (outboard) TANKS IF INSTALLED

"FUEL - 100/130 OCTANE - 11.5 GAL" (11.5 gal. useable each tank if transferred in level flight).

On face of each auxiliary tank fuel quantity gauge, if installed:
"CAP. 11.5 GAL".

"DO NOT TURN OFF ALTERNATOR IN FLIGHT EXCEPT IN CASE OF EMERGENCY"

L. Door off operation (rear passenger door or rear passenger door and baggage compartment door off):

1. Maximum speed with door removed 125 MPH IAS
2. Maximum angle of bank - 30°
3. Maximum angle of yaw - 10°
4. No smoking permitted
5. Flight limited to VFR conditions.

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AIRPLANE FLIGHT MANUAL

II PROCEDURES

PREFLIGHT INSPECTION:

A. INTERIOR:

1. BAT. Switch.....ON
2. Fuel gauges.....CHECK INDICATIONS
3. All Electrical Switches.....OFF
4. BAT. Switch.....OFF
5. Flaps.....FULL DOWN

B. EXTERIOR: Begin at the left front door, proceed around the left wing to the nose area, then around the right wing and back to the fuselage, then around the tail section.

1. Fuel drains behind step.....DRAIN (2)
2. Left Flap.....CHECK HINGES & CONTROL ATTACHMENT
3. Aileron.....CHECK HINGES & CONTROL ATTACHMENT
4. Wing Top.....CHECK FOR WRINKLES AS INDICATION OF INTERNAL DAMAGE
5. Wing Main & Aux Fuel Tank Drains.....DRAIN (2)
6. Wing tip and nav. light.....CHECK FOR DAMAGE
7. Auxiliary fuel tank.....VISUALLY CHECK QUANTITY
8. Landing light.....CHECK FOR DAMAGE
9. Wing Tiedown.....REMOVE
10. Pitot tube.....REMOVE COVER
11. Stall Warning Switch.....CHECK FOR FREEDOM OF MOVEMENT
12. Main Fuel Tank.....VISUALLY CHECK QUANTITY
13. Left Landing Gear.....CHECK TIRE INFLATION AND BRAKE LINE SECURITY
14. Bottom left side of cowl.....DRAIN GASCOLATOR (1)
15. Top Cowl; Oil access door.....CHECK OIL QUANTITY
16. Propeller.....CHECK LEADING EDGE FOR DAMAGE
17. Air inlets.....CHECK FOR FOREIGN OBJECTS, INSPECT VISIBLE CONNECTIONS AND COMPONENTS
18. Right landing gear.....CHECK TIRE INFLATION AND BRAKE LINE SECURITY
19. Right wing and controls.....INSPECT SAME AS LEFT WING
20. Wing Main & Aux Fuel Tank Drains.....DRAIN (2)
21. Right fuselage side and top.....INSPECT FOR WRINKLES AS INDICATION OF INTERNAL DAMAGE
22. Static port.....CLEAR
23. Right Stabilizer.....CHECK ATTACHMENT POINTS AND STRUT
24. Right Elevator.....CHECK HINGE POINTS
25. Rudder.....CHECK HINGE POINTS, CONTROL ATTACHMENTS AND NAV. LIGHT
26. Tailwheel.....CHECK INFLATION, ATTACHMENTS, REMOVE TIEDOWNS
27. Left Elevator.....CHECK TAB CONTROLS AND ALL HINGE POINTS
28. Left Stabilizer.....CHECK ATTACHMENT AND STRUT
29. Left Fuselage side and bottom.....CHECK FOR WRINKLES AS INDICATION OF INTERNAL DAMAGE
30. Left side Static port.....CLEAR

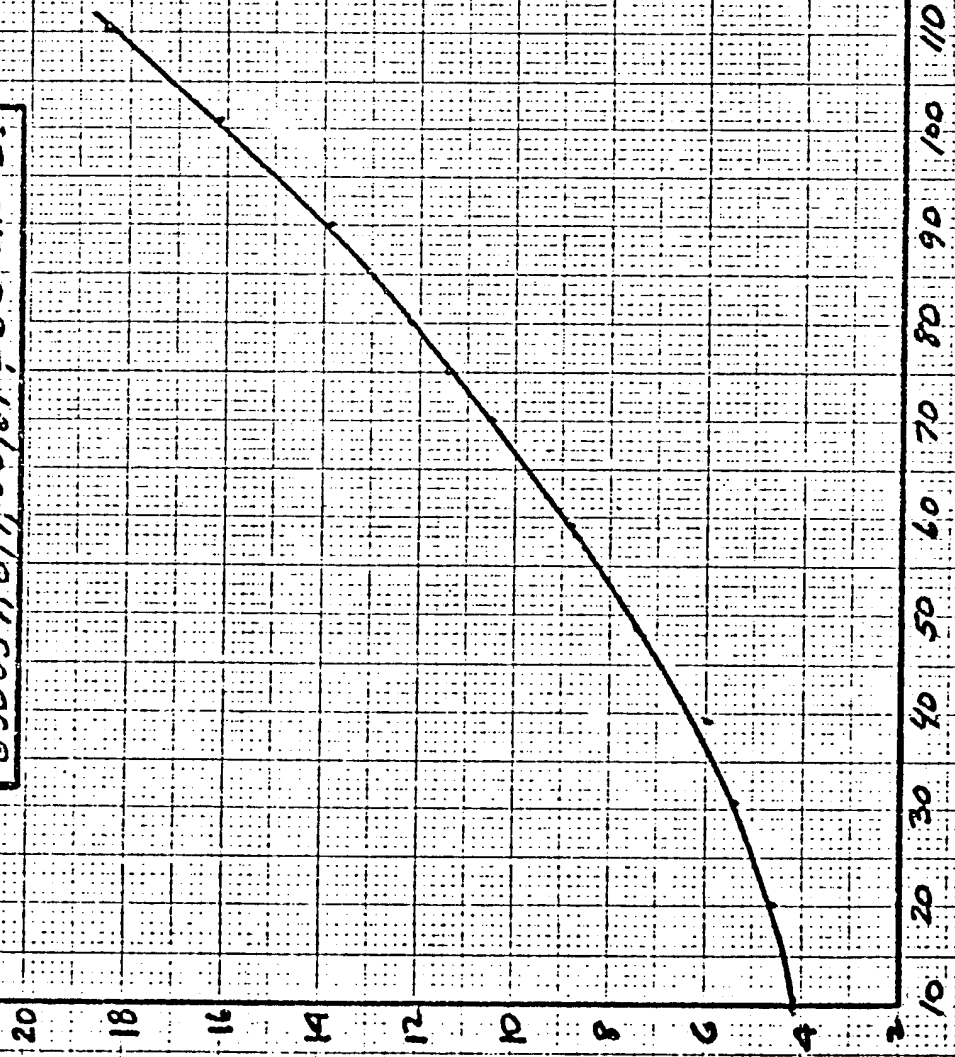
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MIL-G-5572 100/30 AV GAS
631351-1 M.V. SER# D107304
10 J NOZZLES CALIBRATION
630657, 8, 9, 60, 61 & 62 LINES.

ENGINE: IO-360
ACDEGH

G.E. Lloyd TCM FUELS LAB
10/28/73



FLOW - LBS/HR
ENGINE DATA

METERED FUEL PRESS - PSIG

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FIG 7 X 10 INCHES NO 1323
MADE IN U.S.A.
KEUFFEL & ESSER CO.

II. PROCEDURES

A. Normal Procedures

1. Wing Flap Settings:

Takeoff - Normal 15° (First Notch) (0° permissible)
- Shortfield 35° until safely airborne, then retract
to 15°

Normal Climb and Cruise 0°

Landing 35° (Second Notch) (0° or 15° permissible)

2. Caution: Take off and land on fullest main tank.
3. Best Rate of Climb Speed: 90 MPH (CAS) at sea level, 0 flaps.
Best Angle of Climb Speed: 75 MPH (CAS) at sea level, 15° flaps.
When climbing at altitude observe cylinder head temperature gauge to prevent engine over heating.
4. Right Rudder Trim: Use of right rudder trim is recommended during takeoff and climb to reduce the amount of right rudder force required. During level flight at moderate speeds and glide, the trim control should be in the OFF position, or as required to counteract any fuel unbalance.
5. Stall Warning Indicator: The electric stall warning system will light a red light on the instrument panel at approximately seven mph above the stalling speed. It will be inoperative when the master switch is off.
6. Loss of altitude prior to recovery from a stall may be as much as 200 feet.
7. Maximum 90° crosswind velocity demonstrated: 14 MPH
8. Anti-Collision Light:
WARNING: Anti-Collision light may cause adverse effect on pilot when flying in overcast or haze. It is recommended that it be turned off under these conditions.
9. Auxiliary Gas Tank Operation (if installed):
 - a. The auxiliary fuel tank switches activate transfer pumps which will transfer the contents of the selected auxiliary tank into its respective main tank at a rate of 0.4 gallons per minute (approximately 30 minutes for a full auxiliary tank). Over filling a main tank from an auxiliary tank will force the excess fuel overboard through the tank vent system.

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- b. Recommended fuel use sequence:
 1. Use each main tank to one-half (1/2).
 2. With the left main tank to engine selected, transfer one-half (1/2) of the left auxiliary tank to the left main tank.
 3. With the right main tank to engine selected, transfer the entire right auxiliary tank to the right main tank.
 4. With the left main tank to engine selected, transfer remaining left auxiliary fuel to the left main tank.
 5. Use either main tank as necessary to maintain lateral trim.

B. Emergency Procedures

1. Engine failure.

a. Air Restart:

Check mixture rich (over 8,000 feet a leaner mixture may be required).

Maintain 85 MPH (74K) IAS (engine will not windmill below 80 MPH).

Use Boost Pump for engine restart.

b. Forced Landing:

Maximum glide range under zero wind condition is obtained with prop stopped, 80 MPH, 0° flap setting. Pull fuel shutoff knob. Cut ignition and master switches just prior to landing. Use flaps as necessary.

2. Engine Fire:

Pull Fuel valve OFF

Open throttle to full ON position

Turn ignition switch OFF

Push OFF air vent and cabin heat

3. Spin Recovery:

Intentional spins are prohibited. If aircraft inadvertently enters a spin, immediately use opposite rudder followed by forward elevator for recovery. Adding power assists recovery.

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WEIGHT AND BALANCE

Serial Number _____ Registration Number _____

It is the responsibility of the airplane owner and the pilot to insure that the airplane is loaded properly. The empty weight, empty weight center of gravity and useful load are listed below for this airplane as delivered from the factory. If the airplane has been altered, refer to the aircraft log and/or aircraft records for this information.

WEIGHT AND BALANCE DATA SUMMARY:

Basic Empty Weight (including engine oil)..... _____ Lbs.
Gross Weight..... 2300 Lbs.
Useful Load..... _____ Lbs.
Empty Center of Gravity..... _____ Inches
Empty Weight Moment..... _____ Inch Lbs.

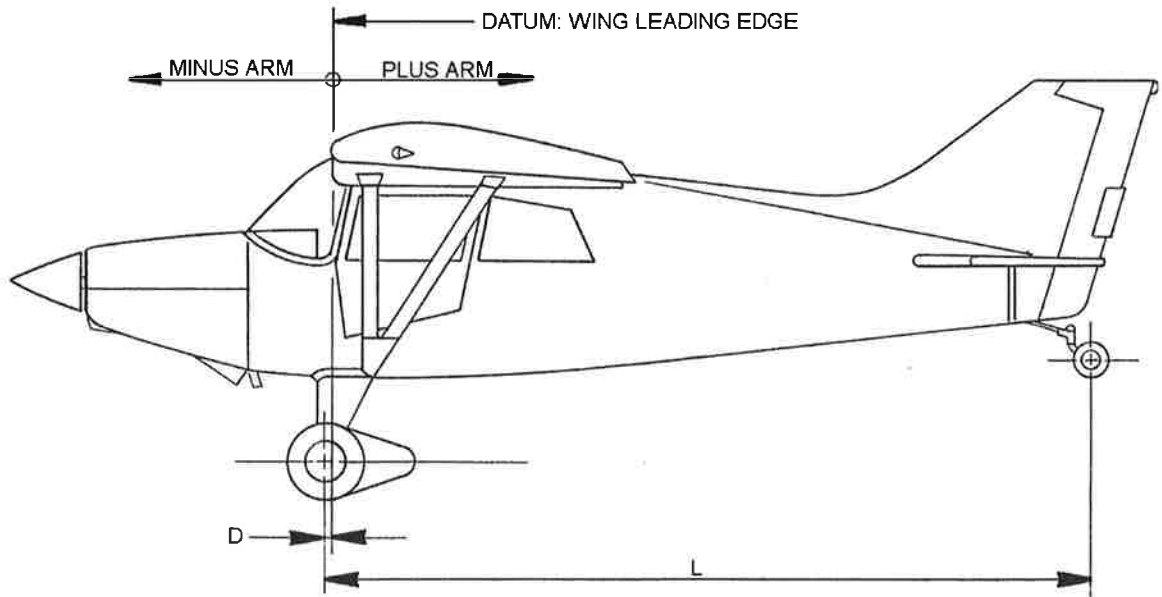
CENTER OF GRAVITY RANGE:

<u>Center of Gravity Range</u>	<u>At Weight of</u>
+16.0 to +20.5 inches	2300 lbs.
+15.0 to +20.5 inches	2100 lbs.
+12.0 to +20.5 inches	1600 lbs. or less

NOTE: Straight line variation between given points
DATUM: Wing leading edge

CERTIFIED BY _____ DATE _____

DETAILED CALCULATIONS OF EMPTY WEIGHT AND EMPTY WEIGHT CENTER OF GRAVITY AS DELIVERED FROM FACTORY:



PROCEDURE:

1. Place each of the wheels on a scale with the tailwheel elevated to place the airplane in approximately the flight attitude.
2. Place a level on the leveling mark and leveling lug on the bottom of the right wing near the root. Adjust the height of the tailwheel until the aircraft is level.
3. Measure the following distances:
 - a. Wheel base (**L**) - the horizontal distance from the tailwheel weight point (center of axle) to the main wheel weight point (center of axle).
 $L = \underline{\hspace{2cm}}$ Inches
 - b. Main Wheel Station (**D**) - the horizontal distance from the main wheel weight point (center of axle) to the datum line.
 $D = \underline{\hspace{2cm}}$ Inches
4. Measure the weights at the following points:
 - a. **Right Main Wheel**..... = $\underline{\hspace{2cm}}$ Lbs.
 - b. **Left Main Wheel**..... = $\underline{\hspace{2cm}}$ Lbs.
 - c. **Tailwheel**, with tare = $\underline{\hspace{2cm}}$ Lbs., minus tare of $\underline{\hspace{2cm}}$ Lbs.
 = net Tailwheel wt. (**T**) of $\underline{\hspace{2cm}}$ Lbs.

Total Weight as Weighted (**W**) = $\underline{\hspace{2cm}}$ Lbs.

The above empty weight includes unusable fuel of 18 lbs. at 24 inches and 9 quarts of oil at minus 34.0 inches plus all items of equipment as marked on the accompanying Equipment Lists. The certificated empty weight is the above weight less 18 lbs.

drainable oil at a minus arm of 34 inches and for this airplane is _____ lbs.

The corresponding empty weight center of gravity is _____ inches.

5. Calculations for determining weight, C.G. and moment:

a. Center of Gravity (inches) = $\frac{L \times T}{W} - D$

i.e., C.G. = _____ - _____ = _____ inches.

b. Moment (inch pounds) = $W \times C.G.$

i.e., Moment = _____ x _____ = _____ inch lbs.

EXAMPLE OF WEIGHT AND BALANCE CALCULATION FOR LOADED AIRCRAFT:

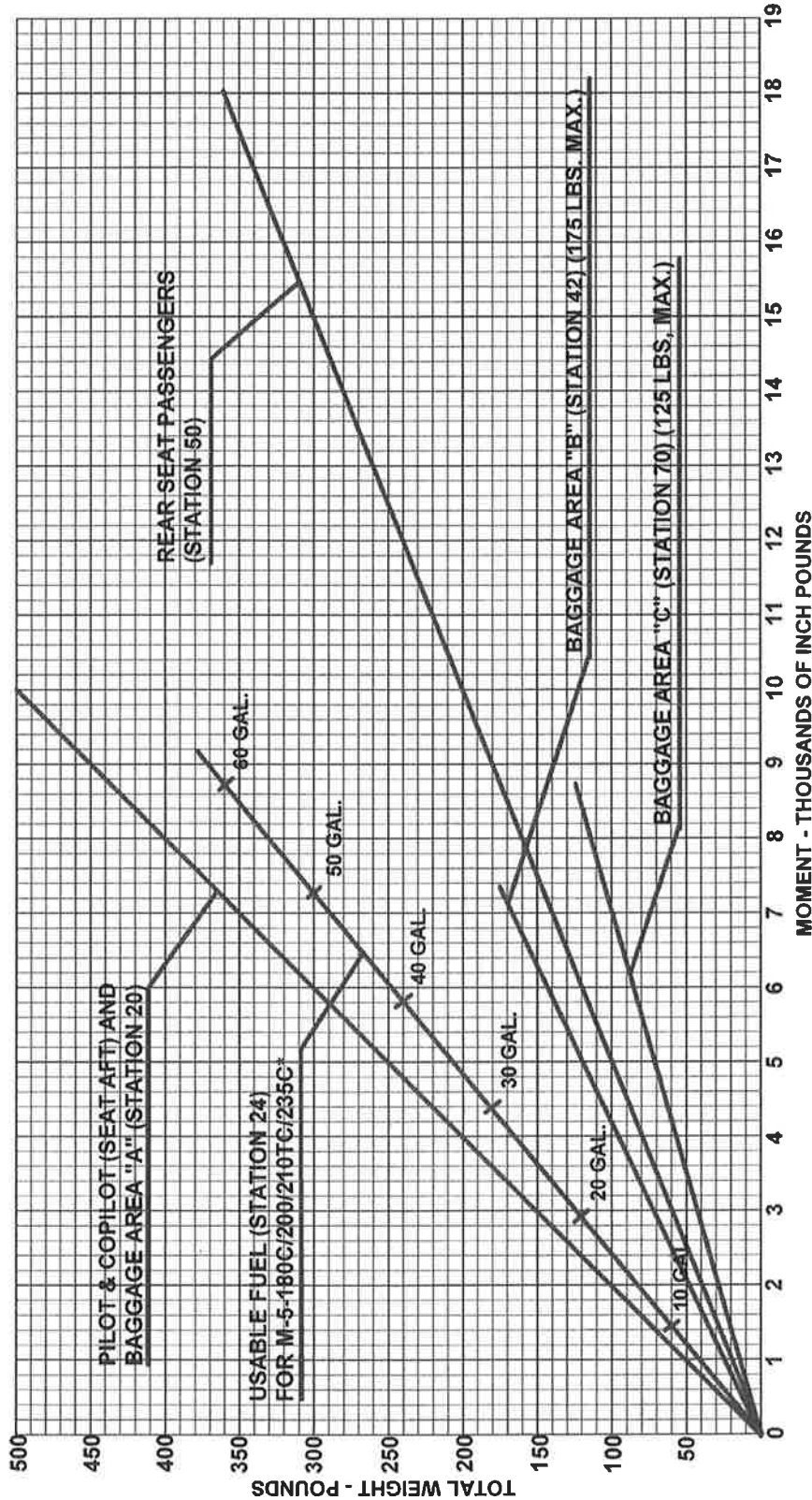
An airplane with an empty weight of 1430 lbs. and empty weight C.G. location of 11.0 inches is loaded with a pilot and front seat passenger, fuel and baggage.

Item	Weight, lbs.	C.G. Location	Moment, In.lbs.
Empty Weight (including engine oil)	1430	11.0	15,730
Pilot and Front Passenger	340	*	6,800
Fuel - 40 gal. in Mains plus 23 gal. in Aux.	378	*	9,072
Baggage (Area "C")	<u>125</u>	*	<u>8,750</u>
	2273	17.8	40,352

*Moments can be read directly from the loading graph.

By locating the point corresponding to 2273 lb. aircraft weight and a C.G. Location of 17.8 inches on the Center of Gravity envelope graph, you can see that this point falls within the envelope, signifying the loading is acceptable.

MAULE **M-5-210C**



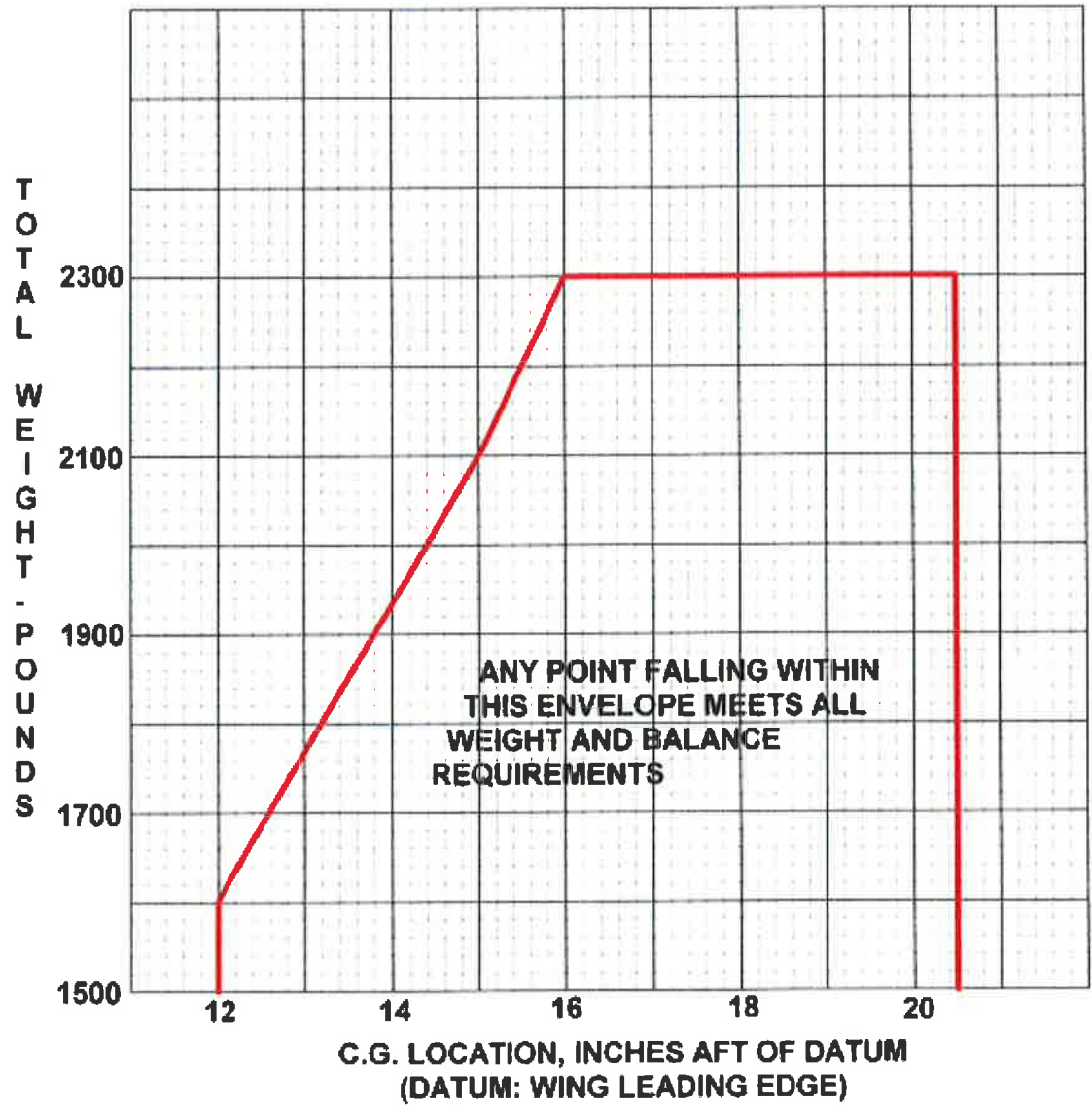
LOADING CHART

PROCEDURE FOR DETERMINING WEIGHT & CENTER OF GRAVITY:

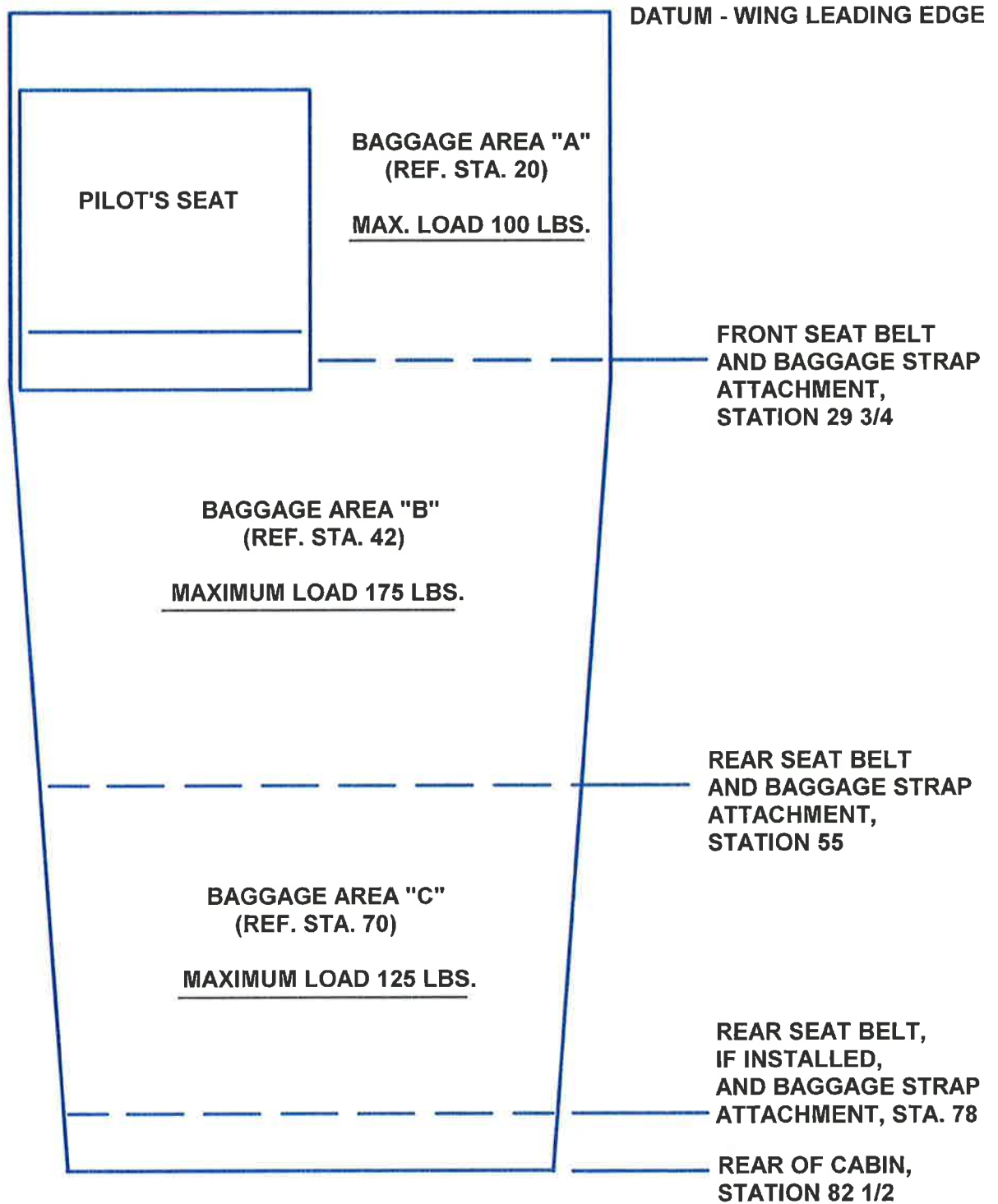
1. Add weight of items to be carried to the basic empty weight of the aircraft.
2. Find moments of items to be carried by using the above loading graph and add these moments to the empty moment of the aircraft. Divide total moment by total weight for aircraft C.G. location.
3. Using the C.G. location from Step 2, find the point on the Weight and Balance Envelope.

*FOR M-5-210C/220C, USE (STATION 23.3) FOR FINDING USABLE MAIN TANK FUEL MOMENT AND (STATION 22.2) FOR FINDING AUX FUEL TANK MOMENT

WEIGHT AND BALANCE ENVELOPE



STRUCTURAL CAPACITY CHART



SERIAL NO. _____ REG. NO. _____ MODEL _____

EQUIPMENT CHANGE - WEIGHT AND BALANCE

ITEM'S (MAKE & MODEL) WEIGHT ARM MOMENTS

Previous Aircraft Empty			

- A. New Empty Weight _____ lbs.
- B. New Empty Center of Gravity _____ ins.
- C. New Empty Weight C.G. Moment _____ in. lbs.
- D. New Useful Load _____ lbs.

Supersedes all previous weight and balance data. For aircraft loading see instructions in original weight and balance forms.

BY _____ DATE _____