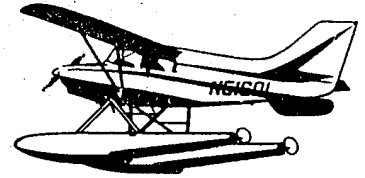


# Maule Aircraft Corporation

SPENCE AIR BASE :- MOULTREE, GEORGIA 31768 :- PHONE 912/985-2045



12 November 1968

SERVICE LETTER NO. 15

SUBJECT: Modification of Model M-4-210 series aircraft for new gross weight of 2300 lbs.

SERIAL NUMBERS AFFECTED:

M-4-210 series, s/n's 1001 thru 1045

M-4-210C series, s/n's 1001C thru 1074C, 1079C, 1080C

BACKGROUND:

This letter outlines the modifications required on our model M-4-210 series aircraft in order to get it licensed at the new gross weight of 2300 lbs.

REQUIRED CHANGES:

1. Rudder Trim Control Installation
2. New Flight Manual
3. New Weight and Balance with Loading Instructions

A kit is available for \$45.00 which contains all required parts, materials and instructions for this modification. When ordering, please give aircraft Serial and Registration Numbers.

MATERIAL REQUIRED:

1. Drawing 3006F, rev. G.
2. Airplane Flight Manual, rev. 3 dated 10/15/68.
3. Weight and Balance data and Loading Instructions dated 11/11/68.
4. Rudder Trim Kit #15 containing the following parts:
  - 1 ea. Placard 3006F-1
  - 1 ea. Control (marked as per drawing)
  - 1 ea. Casing Clamp 5001B
  - 1 ea. Spring 3008B
  - 1 ea. Nicopress Sleeve 18-1-C
  - 2 ea. Nut AN365-1032
  - 2 ea. Washer AN960-10
  - 1 ea. Bolt AN3-5
  - 1 ea. Bolt AN3-12
  - 1 ea. Horn 3007B

NOTE: This installation is to be made as per Maule dwg 3006F, rev. G, by a certificated mechanic or repair facility. When modification is completed, make proper log entries, fill out Service Letter #15 Compliance Record and return.

Maule Aircraft Corporation  
Service Letter #15 - Compliance Record

Airplane Serial Number \_\_\_\_\_

Airplane Registration Number \_\_\_\_\_

The following action was taken with respect to this service letter:

(Check one)

Service Letter #15 completed

I no longer own this airplane. It was sold to:

Name \_\_\_\_\_

Address \_\_\_\_\_

City, State, Zip Code \_\_\_\_\_

Certified by \_\_\_\_\_  
(Signature)

\_\_\_\_\_  
(Printed Name)

Title \_\_\_\_\_  
(Owner, A&P, IA, etc.)

Return this Compliance Record to:

Maule Aircraft Corporation  
Spence Air Base  
Moultrie, GA 31768

Atten: Engineering Records

3  
FAA APPROVED

AIRPLANE FLIGHT MANUAL

MAULE AIRCRAFT CORPORATION  
JACKSON, MICHIGAN

Model M-4 - 210 Series

(Includes Models M-4-210, M-4-210S, M-4-210C and M-4-210T)

Airplane Serial No. \_\_\_\_\_

FAA Ident. Number \_\_\_\_\_

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

APPROVED

FOR

*John W. Husley*  
\_\_\_\_\_  
JOHN A. CARRAN, Chief  
Engineering & Manufacturing Br.  
Central Region

DATE: March 15, 1966

MAULE MODEL M-4-210 SERIES  
AIRPLANE FLIGHT MANUAL

LOG OF REVISIONS

Rev. No.	Page Number (s)	Description	Date of Revision	Approved By*
1	3 & 4	Install header tank and fuel system modifications	11/18/64	<i>J. W. Husley</i>
2	All	Include approval of Models M-4-210, M-4-210S, M-4-210C and M-4-210T airplanes.	3/15/66	<i>J. W. Husley</i>
3	2, 3 & 4	Increased gross weight to 2300 pounds and revised center of gravity limits.	10/15/68	<i>J. W. Husley</i>

\* For Chief, Engineering & Manufacturing Branch, Central Region

MAULE AIRCRAFT CORPORATION

AIRPLANE FLIGHT MANUAL

**MAULE M-4-210/C**

Page ii

LOG OF SUPPLEMENTS

SUPP. NO.	NO. OF PAGES	DESCRIPTION	APPROVAL DATE
1	1	Flight operation with <b>Right Rear Door removed</b> - STC SA258CE. (M-4-210)	09/24/64
2	3	Installation of <b>Fli-Lite 3000 MK IIIA Skis</b> - Maule drawing <b>9079A</b> . Revised	09/25/64 10/07/65
3	1	Installation of Federal Model <b>A2000A Skis</b> . (09/28/64) Revised	10/07/65
-	1	Installation of <b>Landes-Airglas L-2500A Main Skis</b> . (STC SA222AL)	12/05/66
4	2	Installation of Federal Model <b>C3000H Skis</b> .	09/20/67
5	2	Installation of Federal Model <b>C2200H Skis</b> .	02/09/68
6	1	Installation of <b>Fleet Model 2500 Floats</b> . *	07/23/68
-	7	Installation of <b>CAP Model 62-2000 Floats</b> . (Requires Page 3 of Spec. S-14)	11/21/66
7	1	Installation of <b>EDO Model 248A2440 or 248B2440 Floats</b> - Maule STC SA609CE. * Revised	11/29/68 09/19/69
8	2	Operation of aircraft with <b>Wing Tip Auxiliary Fuel Tanks installed</b> .	06/04/75
9	1	Installation of Continental IO-360- <b>D</b> engine - <b>Maule SL#42</b> . (Applicable to s/n's 1001-1045, 1001C-1085C)	01/15/80
10	2	<b>Preflight Inspection</b> added for Airplane Flight Manuals dated 9/24/64 and 3/15/66.	05/01/84
11	2	Flight operation with <b>Right Rear Passenger Door removed</b> . (M-4-210C)	09/13/96
12	2	Flight operation with <b>either one (not both) of the Front Doors removed</b> . (M-4-210C)	09/13/96

\*For s/n's 1001-1035 with Maule SL#7 and #15 complied with; 1036-1045, 1001C-1074C, 1079C, 1080C with SL#15 complied with and 1075C-1078C, 1081C-1117C.

MAULE MODEL M-4 - 210 SERIES  
AIRPLANE FLIGHT MANUAL

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SECTION II - PROCEDURES

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Emergency Procedures	Page 4

FAA APPROVED  
DATE: 3/15/66

MAULE MODEL M-4-210 SERIES  
AIRPLANE FLIGHT MANUAL

## I. LIMITATIONS

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

A. Engine	Continental Model IO-360A
B. Engine Limits	Take Off (5 Min) 2800 RPM (210 HP) METO POWER 2800 RPM @ 26.5Hg (195 HP)
C. Fuel	100/130 Minimum Grade Aviation Gasoline
D. Propellers	McCauley D2A3467/76C-2
E. Power Plant Instruments:	
*Cylinder Head Temp	Green Arc: 100° F-460° F (Normal Operating Range) Red Radial: 460° F
Manifold Pressure	Green Arc: 14.5-26.5 In. Hg. (Normal Operating Range) Yellow Arc (Caution) 26.6-29.0" Hg Red Radial 29.0 In. Hg.
Oil Temperature	Green Arc: 75-225° F (Normal Operating Range) Yellow Arc (Caution): Below 75° F Red Radial: 225° 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

\*NOTE: This instrument is optional.

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 ( $V_P$ )	125 mph (109K)	
Max. Flap Extension Speed ( $V_F$ )	90 mph (82K)	
Flap Operating Range	56-90 mph (49-82K)	(White Arc)

NOTE 1. 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.
- (d) WHITE arc denotes speed range in which flaps may be safely lowered.

G. Maneuvers: Normal Category maneuvers only are approved.

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

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

WARNING: Use controls with caution above 125 mph (109K) CAS.

I. Maximum Weight 2300 lbs.

J. Center of Gravity Limits

	(+16.0) to (+19.6)	at 2300 lbs.
	(+15.0) to (+23.0)	at 2100 lbs.
	(+11.0) to (+23.0)	at 1400 lbs.
		or less

Straight Line variation between points given  
Datum: Wing Leading Edge

NOTE 2. 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.



K. Placards:

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

"NO ACROBATIC MANEUVERS INCLUDING SPINS APPROVED."

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

"TAKE OFF WITH 15° FLAPS"

Types of Operation Authorized:

One of the following placards is required depending on equipment installed. (See FAR 91).

"THIS AIRCRAFT APPROVED FOR DAY VFR FLIGHT ONLY" or,

"THIS AIRCRAFT APPROVED FOR DAY OR NIGHT VFR FLIGHT" or,

"THIS AIRCRAFT APPROVED FOR DAY OR NIGHT VFR OR IFR FLIGHT".

L. Warning: Flight into icing conditions not approved.

M. Fuel System Operation

"TAKE OFF AND LAND ON FULLEST MAIN TANK."

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

II. PROCEDURES

A. Normal Procedures

1. Wing Flap Settings:

Takeoff	15°	(First Notch)
Cruise	0°	(Full Up-Retracted)
Landing	35°	(Second Notch)

2. Best rate of climb speed: 90 MPH (CAS) at sea level.

3. Stall Warning Indicator:

The required 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.

4. Altitude loss during stall recovery may be as much as 200 feet.

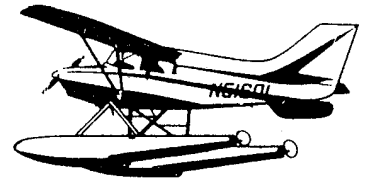
5. Maximum 90° crosswind velocity demonstrated: 20 mph
6. Right Rudder Trim:  
Use of right rudder trim is recommended during takeoff, climb and high speed flight to reduce the amount of right rudder force required. During level flight at moderate speeds and for glides the trim control should be in the off position.
7. Anti-Collision Beacon  
WARNING: Turn anti-collision lights "off" when encountering adverse atmospheric conditions such as haze, fog or clouds.

B. Emergency Procedures:

1. Air Restart  
Use primer pump for engine restart.
2. Engine Failure  
Use 15° flap setting (first notch), maintain 85 mph (78K) CAS.  
If air restart is not possible, cut ignition and master switches.  
Execute forced landing.
3. Engine Fire  
Turn fuel valve OFF.  
Open throttle to full ON position.  
Turn ignition switch OFF.

# Maule Aircraft Corporation

SPENCE AIR BASE -:- MOULTREE, GEORGIA 31768 -:- PHONE 912/985-2045



FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT NO. 10

FOR

Models M-4-210, M-4-210S,  
M-4-210T and M-4-210C

Reg. No. \_\_\_\_\_

Ser. No. \_\_\_\_\_

This Supplement must be attached to the FAA Approved Airplane Flight Manual dated 24 September 1964 or 15 March 1966 when Quick Drains are installed in the Main and Auxiliary Fuel Tanks in accordance with Maule Service Letter No. 32 and Service Bulletin No. 5 (considered mandatory).

The information contained herein supersedes or supplements the information of the basic Airplane Flight Manual; for limitations, procedures and performance information not contained in this Supplement, consult the basic Airplane Flight Manual.

FAA APPROVED:

*John R. James*

MANAGER, ATLANTA AIRCRAFT CERTIFICATION  
OFFICE, FAA, CENTRAL REGION

DATE: May 1, 1984

MAULE AIRCRAFT CORPORATION

MOULTRIE, GEORGIA

AFM SUPPLEMENT NO. 10

for M-4-210, M-4-210S, M-4-210T, M-4-210C

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

**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.

3

4

**WEIGHT AND BALANCE DATA SUMMARY AS DELIVERED FROM THE FACTORY:**

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:**

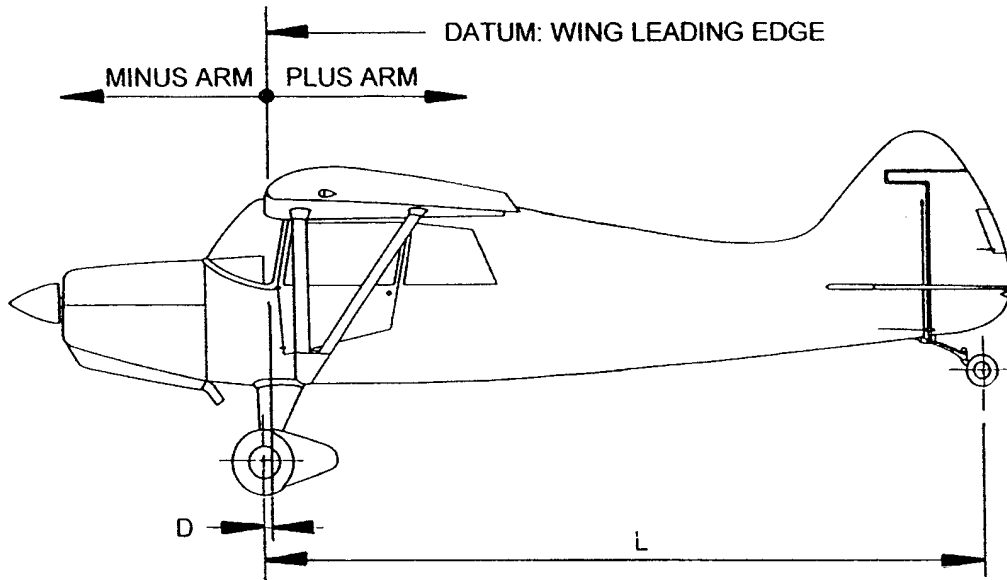
<u>Center of Gravity Range</u>	<u>At Weight of</u>
+16.0 to +19.6 inches	2300 lbs.
+15.0 to +23.0 inches	2100 lbs.
+11.0 to +23.0 inches	1400 lbs. or less

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

Skiplane Center of Gravity Range with Fli-Lite 3000 MK IIIA or Federal A2000A skis is same as landplane except gross weight is limited to 2100 lbs.. Skiplane empty weight and center of gravity will be done with the skis in the wheel position.

CERTIFIED BY \_\_\_\_\_ DATE \_\_\_\_\_

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



3

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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.

WEIGHT AND BALANCE: (Cont'd)

The above empty weight includes unusable fuel of 18 lbs. at 24 inches and 10 quarts of oil at minus 37.0 inches, plus all items of equipment as marked on the accompanying Equipment Lists. The Certificated empty weight is the above weight less 12.5 lbs.

drainable oil at a minus arm of 37.0 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) =  $\frac{L \times T}{W} \cdot D$

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:

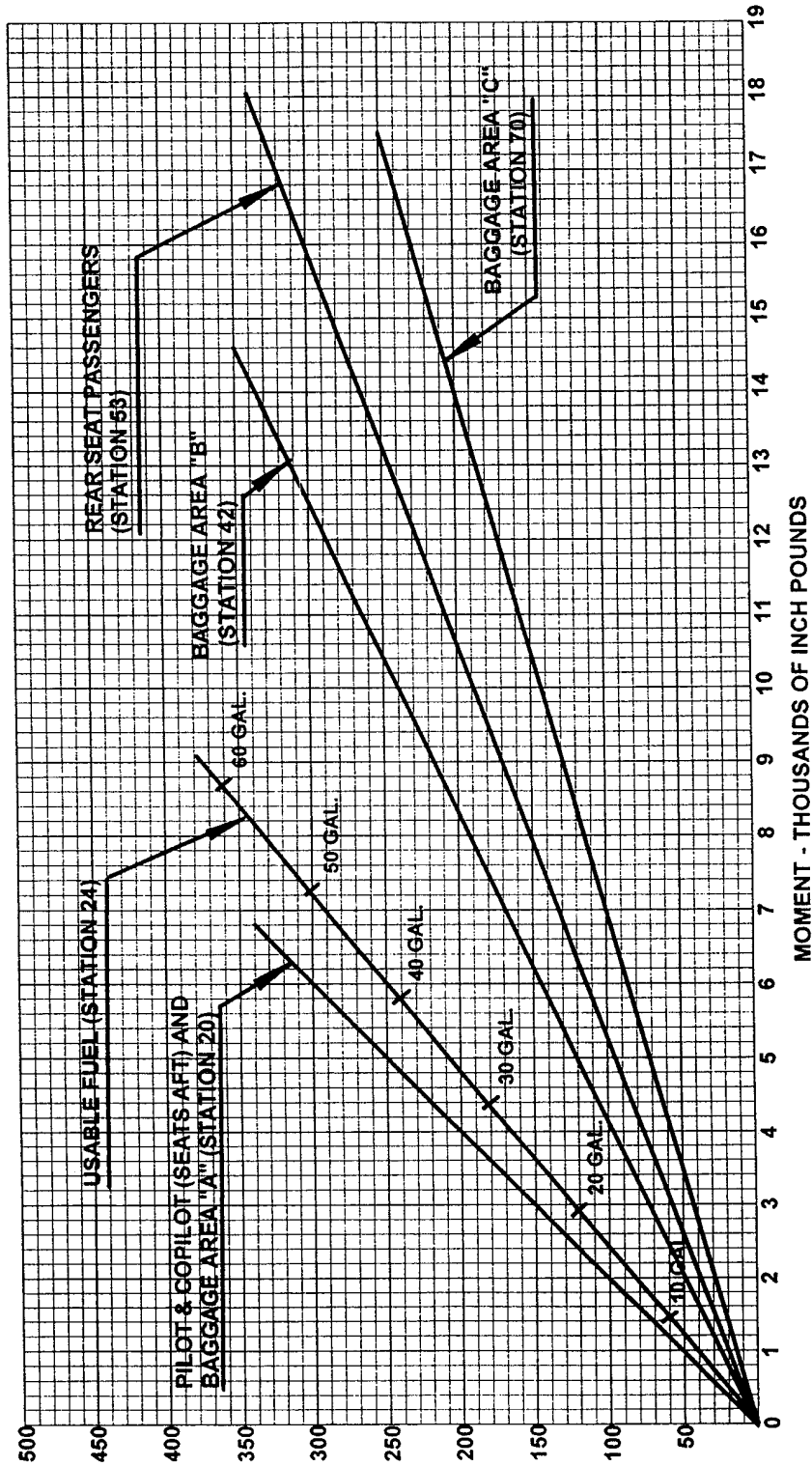
An airplane with an empty weight of 1147 lbs. and empty weight C.G. location of 11.2 inches is loaded with a pilot and front and rear seat passengers, fuel and baggage.

Item	Weight, lbs.	C.G. Location	Moment, In.lbs.
Empty Weight (including engine oil)	1147	11.2	12,846
Pilot and Front Passenger	340	*	6,800
Rear Seat Passengers	340	*	18,020
Fuel - 40 gal. in Mains	240	*	5,750
Baggage (Area "C")	10	*	700
	<u>2077</u>	21.2	<u>44,116</u>

\*Moments can be read directly from the loading graph.

By locating the point corresponding to 2077 lb. aircraft weight and a C.G. Location of 21.2 inches on the Center of Gravity envelope graph, you can see that this point falls within the envelope, signifying the loading is acceptable.

3  
 4



**PROCEDURE FOR DETERMINING WEIGHT & CENTER OF GRAVITY:**

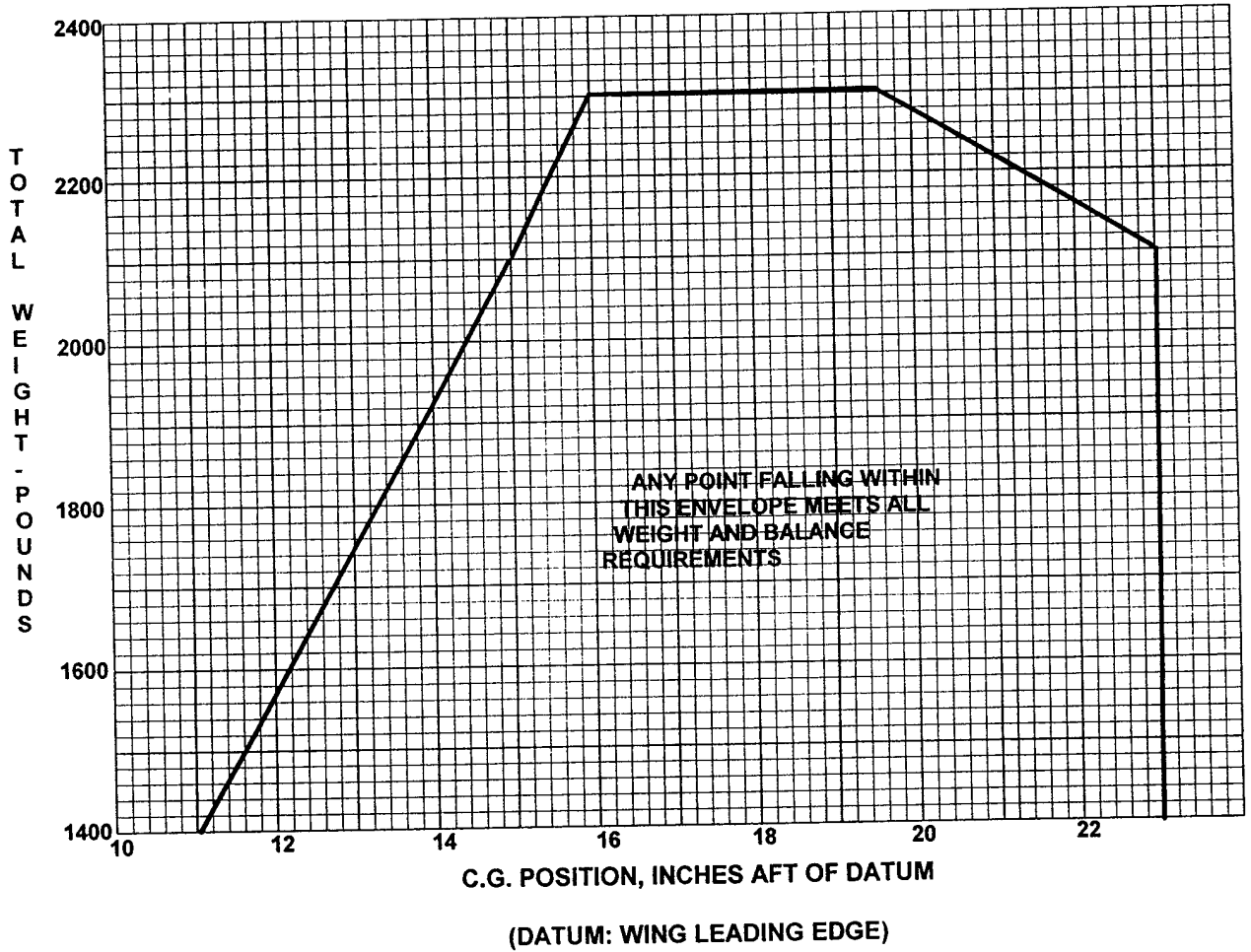
1. Add weight of items to be carried to the basic weight of the aircraft.
2. Find moments of items to be carried by using the above loading graph and add these moments to the basic weight moment of the aircraft.
3. Using the total weight and moment from Step 2, find the point on the center of gravity envelope which corresponds to this total weight and total moment.

**LOADING CHART**



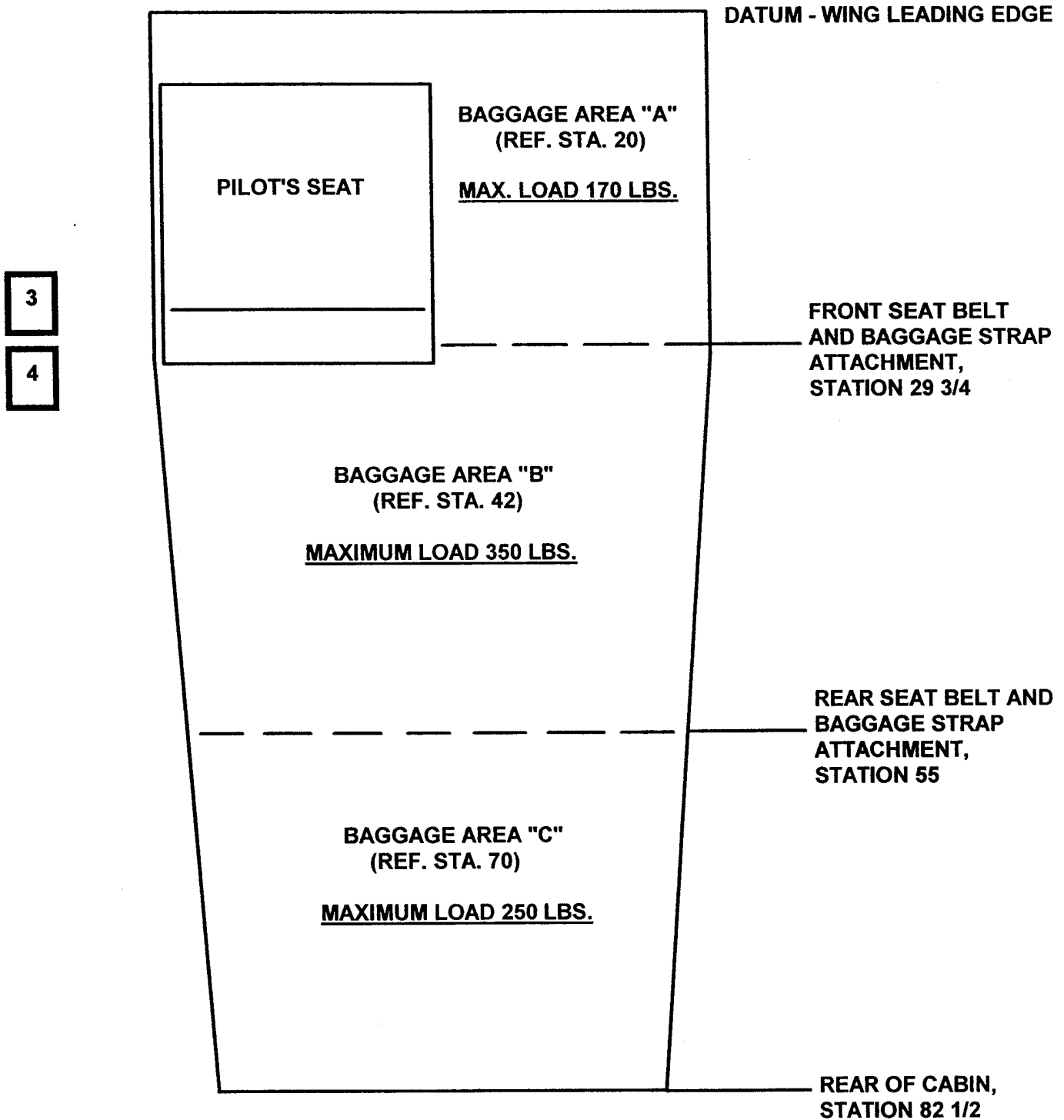
**WEIGHT AND BALANCE ENVELOPE**

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4



**MAULE M-4-210IC**

STRUCTURAL CAPACITY CHART



MAULE AIRCRAFT CORPORATION  
 AIRPLANE FLIGHT MANUAL  
**MAULE M-4-210IC**

WEIGHT AND  
 BALANCE

SERIAL NO. \_\_\_\_\_ REG.NO. \_\_\_\_\_ MODEL \_\_\_\_\_

EQUIPMENT CHANGE - WEIGHT AND BALANCE

ITEM'S (MAKE & MODEL)      WEIGHT      ARM      MOMENTS

ITEM'S (MAKE & MODEL)	WEIGHT	ARM	MOMENTS
Previous Aircraft Empty			

3

4

- 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 \_\_\_\_\_