FAA APPROVED

AIRPLANE FLIGHT MANUAL

MAULE AIRCRAFT CORPORATION
JACKSON, MICHIGAN

Model M-4 Series

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

Airplane Serial No._____

FAA Ident. Number _____

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

APPROVED: John W. Stanley
FOR JOHN A. CARRAN, Chief
Engineering & Manufacturing Branch
Central Region

DATE: March 15, 1966

MAULE MODEL M-4 SERIES

AIRPLANE FLIGHT MANUAL

LOG OF REVISIONS

Rev. No.	Page Number(s)	Description	FAA Approval & Date
1	ALL	Include approval of Models M-4, M-4S, M-4C & M-4T airplanes in the M-4 series.	Manual signed by John W. Hurley for Chief, Engineering & Mfg. Branch, Central Region, FAA
2	ALL	Revised to include all M-4 series (less M-4-180 & M-4-210 models) Serial No. 1 and subsequent. Adds additional Normal and Emergency Operating Procedures.	John R James Manager Atlanta Aircraft Certification Office, Central Region, FAA Date MAY 1 1984

* For Chief, Engineering & Manufacturing Branch, Central Region

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DATE: 3-15-66

LOG OF SUPPLEMENTS

SUPP. NO.	NO. OF PAGES	DESCRIPTION	APPROVAL DATE
1	2	Limitation for Flight with **Right Rear Door removed** - (STC SA258CE). (Applicable only on M-4 and M-4S)	09/24/64
2	3	Installation of **Fli-Lite** Model **3000 MK IIIA Skis.**	09/25/64
3	1	Installation of **Federal** Model **A2000A Skis**.	09/28/64
-	1	Installation of **Landes-Airglas** Model **L-2500A Skis** – (STC SA222AL).	12/05/66
4	4	Operation of aircraft when **Auxiliary Fuel Tanks** are installed.	06/11/97
-	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	Installation of **GARMIN GNS-530** (GPS/NAV/COMM) **System** - Maule Drawing **7253A**.	06/30/03
-	4	Installation of **GARMIN GTX-330 Mode S Transponder Traffic Information System** (TIS) - Maule Drawing **7255A**.	06/30/03
5	2	Installation of **Right Rudder Trim** per Maule Modification Kit No. **18**.	04/11/05
-	3	Operation of aircraft when Micro AeroDynamics **Vortex Generator System** is installed per Maule Drawing **9177A**.	12/16/05

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REV. 2 dated:
MAY 1 1984

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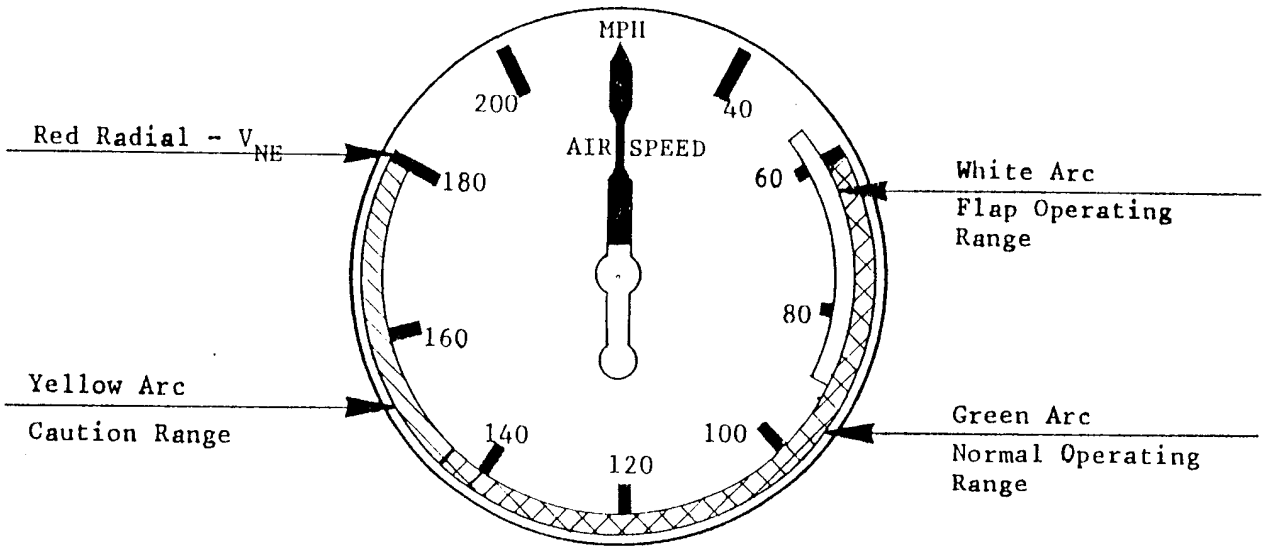
SECTION I

OPERATING LIMITATIONS

1.1 AIRSPEED LIMITS: All airspeeds are calibrated airspeeds.

A. AIRSPEED INDICATOR MARKINGS:



B. EXPLANATION OF AIRSPEED INDICATOR MARKINGS:

Red Radial Line - Never exceed Speed (V_{NE}), 180 mph (156K): Maximum safe airspeed in smooth air.

Yellow Arc - Caution Range, 145-180 mph (126-156K): Operation in this speed range should be conducted only in smooth air, and control movements should not be large or abrupt.

Green Arc - Normal Operating Range, 60-145 mph (52-126K): Extends from flaps up, power off stall speed at 2100 lbs. (V_{S1}) to design cruise speed (V_C).

White Arc - Flap Operating Range, 53-90 mph (45-78K): Extends from full flap, power off minimum stall speed at 2100 lbs. (V_{SO}) to the Maximum flaps extended speed (V_{FE}).

C. DESIGN MANEUVERING SPEED: The maximum safe airspeed at which full aerodynamic controls can be applied (V_A) is 125 mph (109K). This airspeed is not marked on the airspeed indicator.

1.2 POWER PLANT LIMITATIONS:

Engine:	Continental O-300-A or B
Engine Limits:	145 hp @ 2700 rpm, Full Throttle Continuous
Propeller:	McCauley 1A170-DM7460; or 1C172-MDM7647 to 7656 (eligible on s/n 24, 46 thru 94, 1C thru 11C, 1S thru 3S and 1T thru 3T only)
Fuel:	80/87 Minimum Grade Aviation Gasoline

Engine Instrument Markings:

*Cylinder Head Temperature:	Green Arc - Normal Operating Range, 100°F - 525°F.
	Red Radial - Operating Limit, 525°F.
Oil Temperature:	Green Arc - Normal Operating Range, 90°F - 225°F
	Yellow Arc - Caution Range, 65°F - 225°F.
	Red Radial - Minimum Operating Limit, 65°F.
	Red Radial - Maximum Operating Limit, 225°F.
Oil Pressure:	Green Arc - Normal Operating Range, 30 - 45 psi.
	Yellow Arc - Caution Range, 5 - 30 psi.
	Red Radial - Minimum Operating Pressure, 5 psi.
	Red Radial - Maximum Operating Pressure, 45 psi.
*Manifold Pressure:	Green Arc - Normal Operating Range, 14.5 - 29.0 ins. of Mercury
	Red Radial - Maximum Operating Limit, 29.0 ins. Hg.
Tachometer:	Green Arc - Normal Operating Range, 1800 - 2700 RPM.
	Red Radial - Maximum RPM, 2700 RPM.

* NOTE: These instruments are optional.

1.3 MAXIMUM WEIGHT: 2100 Pounds

1.4 CENTER OF GRAVITY LIMITS: +15.0 to +23.0 inches @ 2100#
+11.0 to +23.0 inches @ 1400# or less

Straight Line Variation between points given.
Datum: Wing Leading Edge.

1.4 CENTER OF GRAVITY LIMITS: (Con't)

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

1.5 MANEUVERS: Only Normal Category Maneuvers including stalls, lazy eights, Chandelles and steep turns involving bank angles not greater that 60° are approved in this airplane.

////////////// ////CAUTION/// ////////////// AEROBATICS AND INTENTIONAL SPINS PROHIBITED.

1.6 FLIGHT LOAD FACTORS: Flaps fully Retracted: 3.8g Positive to 1.5g Negative
Flaps Extended: 1.9g Positive to 0g Negative

1.7 USABLE FUEL: MAIN Tanks - 20.0 Gallons each
OPTIONAL AUXILIARY Tanks - 11.5 Gallons each

1.71 UNUSABLE FUEL: 1.5 Gallons per Main tank.

/////////////// ////CAUTION//// /////////////// FUEL REMAINING IN TANK WHEN INDICATOR READS EMPTY CANNOT BE USED SAFELY IN FLIGHT.

1.8 DOOR-OFF OPERATION:

This aircraft may be operated with the right rear passenger door off. When doing so, observe the following additional limitations:

1. Maximum airspeed - 125 mph
2. Maximum bank angle - 30°
3. Maximum yaw angle - 10°
4. No Smoking permitted.
5. Limit flight to VFR conditions.

NOTE: Flight with the door removed is limited to operations where door removal is mission required.

1.9 PLACARDS:

The following Placards are in the cockpit in clear view of the pilot.

"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)"

"TAKEOFF WITH 15° FLAPS"

1.9 PLACARDS: (Con't)

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"

The following placard is located at the main fuel tank selector valve (s/n 23, 25 thru 45):

TAKEOFF + LANDING
LEFT ONLY
21 GAL.

RIGHT
21 GAL.

OFF

The following placard is located at the main fuel tank selector valve (s/n 24, 46 thru 94, 1C thru 11C, 1S thru 3S and 1T thru 3T):

TAKEOFF + LANDING
BOTH TANKS

LEFT
21 GAL.

RIGHT
21 GAL.

OFF

The following placard is located on the instrument panel at the auxiliary tank transfer switches:

FUEL TRANSFER PUMPS

PUSH FOR
AUX QUANT.

PUSH FOR
AUX QUANT.

LEFT RIGHT

FUEL CAPACITY: MAIN TANKS 20 GAL USABLE EACH, AUX. TANKS 11.5 GAL USABLE EACH.

The following placard is to be located at the top of the instrument panel and to the right of the radio group (s/n 3 thru 91):

"NO SMOKING"

SECTION II

NORMAL OPERATING PROCEDURES

2.1 PREFLIGHT INSPECTION:

A. INTERIOR:

1. MASTER SWITCH.....ON
2. FUEL gauges.....CHECK INDICATIONS
3. ALL Electrical Switches.....OFF
4. MASTER 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 TIE RODS
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 CONTROL AND ALL HINGE POINTS
28. Left Stabilizer.....CHECK ATTACHMENT AND TIE RODS

29. Left fuselage side and bottom.....CHECK FOR WRINKLES AS INDICATION OF INTERNAL DAMAGE
30. Left side Static port.....CLEAR

2.2 OPERATING CHECK LISTS:

A. BEFORE STARTING:

1. Seat Belts and Shoulder Harnesses....FASTENED
2. Flaps.....RETRACTED
3. Circuit Breakers.....CHECK

B. STARTING:

1. Parking or toe brakes.....ON
2. Fuel Selector Valve.....ON, LEFT TAKEOFF POSITION OR BOTH TAKEOFF POSITION AS REQUIRED
3. Throttle.....OPEN ONE FOURTH INCH
4. Mixture Control.....FULL RICH
5. Anti-Collision light.....ON
6. Master Switch.....ON
7. Primer.....AS REQUIRED

NOTE: FOR A HOT START DO NOT PRIME.

8. Ignition Switch.....TURN TO "BOTH" POSITION
9. Starter control.....PULL

////////////// IN EVENT OF ENGINE FIRE, CONTINUE CRANKING. IF ENGINE
////CAUTION//// FAILS TO START AFTER SEVERAL REVOLUTIONS, PULL MIXTURE
////////////// FULL LEAN, SECURE IGNITION, MASTER SWITCH, TURN FUEL VALVE OFF AND EXIT AIRCRAFT.

10. After starting @ 800 RPM.....CHECK OIL PRESSURE

////////////// IF NO OIL PRESSURE IS INDICATED AFTER 30 SECONDS,
////CAUTION//// SHUT DOWN ENGINE.
//////////////

11. Generator.....CHECK CHARGING
12. Radios and other electrical switches.....AS REQUIRED
13. Parking brakes.....OFF

C. ENGINE CHECK:

1. Parking Brake.....ON, IF DESIRED
2. Engine Instruments.....CHECK IN THE GREEN
3. Throttle.....INCREASE TO 1700 RPM
4. Magnetos.....SWITCH TO RIGHT, BOTH, LEFT CHECKING RPM DROPS

////////////// A RPM DROP OF MORE THAN 175 RPM OR A DIFFERENCE
////CAUTION//// BETWEEN LEFT AND RIGHT ON MORE THAN 75 RPM IS
////////////// UNACCEPTABLE.

2.2 OPERATING CHECK LIST: (Con't)

C. ENGINE CHECK: (Con't)

5. Carburetor Air Control.....PULL HOT

////////////
////NOTE////
////////////
NORMAL RPM DROP WITH CARBURETOR AIR HOT IS 100 + 100 RPM.

6. Carburetor Air Control.....PUSH COLD (UNLESS ICING CONDITIONS EXIST AT AIRPORT ALTITUDE)

////////////////
////CAUTION////
////////////////
IF ICE FORMS IN CARBURETOR DURING WARM-UP IT MUST BE CLEARED.

7. Vacuun Gauge.....CHECK IN GREEN
8. Throttle.....RETARD TO IDLE

D. BEFORE TAKEOFF:

1. Fuel Selector.....ON, LEFT TAKEOFF POSITION OR BOTH TAKEOFF POSITION (AS REQUIRED)
2. Flaps.....AS DESIRED FOR TAKEOFF
3. Trim Controls.....SET FOR TAKEOFF
4. Flight Controls.....CHECK FOR FREEDOM AND PROPER TRAVEL
5. Mixture Control.....FULL RICH
6. Carburetor Air Control.....PUSH COLD
7. Engine instruments.....RECHECK IN NORMAL RANGE
8. Radios.....AS DESIRED
9. Altimeter.....SET
10. Attitude Indicator.....CHECK ERECT
11. Directional Indicator.....SET
12. Seatbelts and Shoulder Harnesses.....RECHECK FASTENED
13. Doors.....CLOSED AND LATCHED

E. BEFORE LANDING:

1. Seat Belts and Shoulder harnesses....FASTENED
2. Fuel Selector Valve.....ON, LEFT LANDING POSITION OR BOTH LANDING POSITION (AS REQUIRED)
3. Mixture Control.....FULL RICH
4. Flaps.....AS REQUIRED
5. Carburetor Air Control.....PULL HOT (AS REQUIRED)

F. ENGINE SHUT DOWN:

1. Parking Brake.....ON IF DESIRED
2. Radios.....OFF
3. All other Electrical Switches.....AS DESIRED
4. Flaps.....AS DESIRED

////////////
////NOTE////
////////////
ALLOW THE ENGINE TO IDLE AT 800 RPM UNTIL CYLINDER TEMP. HAS BEEN REDUCED APPRECIABLY BELOW NORMAL OPERATING TEMPERATURE.

2.2 OPERATING CHECK LIST: (Con't)

F. ENGINE SHUT DOWN: (Con't)

////////////
////NOTE////
////////////

IF SPARK PLUGS TEND TO FOUL RAPIDLY AT IDLING SPEED, ADVANCE THROTTLE BRIEFLY TO CLEAR THEM BEFORE STOPPING.

5. Throttle.....RETARD TO IDLE
6. Mixture Control.....FULL LEAN

////////////
////NOTE////
////////////

DO NOT OPEN THROTTLE AFTER STOPPING. OPENING THE THROTTLE ACTUATES THE ACCELERATOR PUMP.

7. Ignition Switch.....OFF
8. Anti-Collision light.....OFF
9. Master Switch.....OFF
10. Fuel Selector Valve.....OFF

2.3 NORMAL FLIGHT OPERATIONS:

A. RECOMMENDED FLAP SETTINGS:

Normal Takeoff - 15° (First Notch), 0° (No Flaps) permissible for Takeoff.

Short, rough, soft field Takeoff - 35° (Second Notch) until safely airborne, then retract to 15°.

Normal Climb - 0° (No Flaps)

Best Angle Climb - 15° (First Notch)

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

B. CLIMBING:

Best Rate of Climb - 90 mph CAS, no flaps

Best Angle of Climb - 75 mph CAS, 15° flaps

////////////////
////CAUTION////
////////////////

FOR TAKEOFF OR LANDING UNDER GUSTY, CROSSWIND CONDITIONS, FLAP SETTING OF 0° (NO FLAPS) IS RECOMMENDED.

C. STALLS:

Stalls are preceded by mild rudder buffet which can be felt through the rudder pedals. The red stall warning light on the instrument panel will illuminate at 5 to 10 mph above the stall speed. Loss of altitude prior to recovery from a stall may be as much as 300 feet.

2.3 NORMAL FLIGHT OPERATIONS: (Con't)

D. CROSSWIND LANDINGS AND TAKEOFFS:

Maximum demonstrated 90° crosswind component is 20 mph.

E. FUEL SYSTEM MANAGEMENT:

Fuel is fed to the engine from the main (inboard) tanks and is controlled by the selector valve on the left kick panel. Auxiliary (outboard) tanks feed their respective main tanks via transfer pumps which are controlled by switches on the instrument panel. These transfer pumps tranfer fuel at a rate of 0.4 gallons per minute, or approximately one half hour for a full auxiliary tank. Since overfilling a main tank from an auxiliary tank will force excess fuel overboard, it is recommended that the transfer pumps not be activated until their respective main tanks are slightly more than one quarter full. If the tank being transferred to is feeding the engine, however, transfer can be initiated when the main tank is down to approximately one half. Confirm fuel transfer by illumination of the transfer pump switch and an increase in the respective main tank fuel gauge.

F. ANTI-COLLISION LIGHT:

////////////// ////WARNING//// ////////////// ANTI-COLLISION LIGHT MAY CAUSE ADVERSE EFFECT ON PILOT WHEN FLYING IN VISIBLE MOISTURE, OVERCAST, FOG OR HEAVY HAZE. IT IS RECOMMENDED THAT IT BE TURNED OFF UNDER THESE CONDITIONS.

SECTION III

EMERGENCY PROCEDURES:

3.1 RECOVERY FROM INADVERTENT SPINS:

Intentional spins are prohibited. If the aircraft inadvertently enters a spin, simultaneously apply full rudder opposite to the direction of rotation and full nose down elevator with ailerons neutral. When the rotation stops, neutralize the rudder and elevator, reduce power to idle and ease back on the control wheel as required to smoothly regain level flight. Wing flaps should be retracted to avoid exceeding the maximum flap speeds during recovery.

3.2 EMERGENCY CHECK LISTS:

A. ENGINE FAILURE

1. Mixture Control.....FULL RICH

NOTE: AT ALTITUDES OVER 8000 FT., A LEANER MIXTURE MAY BE REQUIRED.

2. Carburetor Air Control.....PULL HOT
3. Fuel Selector Valve.....SWITCH TANKS
4. Flaps.....FIRST NOTCH (15°)
5. Airspeed.....MAINTAIN 85 MPH MINIMUM
6. Auxiliary Tank Pump Switch.....ON FOR TANK FEEDING ENGINE IF AUXILIARY TANK HAS FUEL

B. FORCED LANDING

1. Airspeed.....MAINTAIN 85 MPH
2. Flaps.....0° FOR MAXIMUM GLIDE DISTANCE; AS NECESSARY FOR LANDING
3. Seat Belts and Shoulder Harnesses.....TIGHTEN
4. Loose Objects.....STOW
5. Fuel Selector Valve.....OFF
6. Master and ignition Switches.....OFF JUST PRIOR TO LANDING

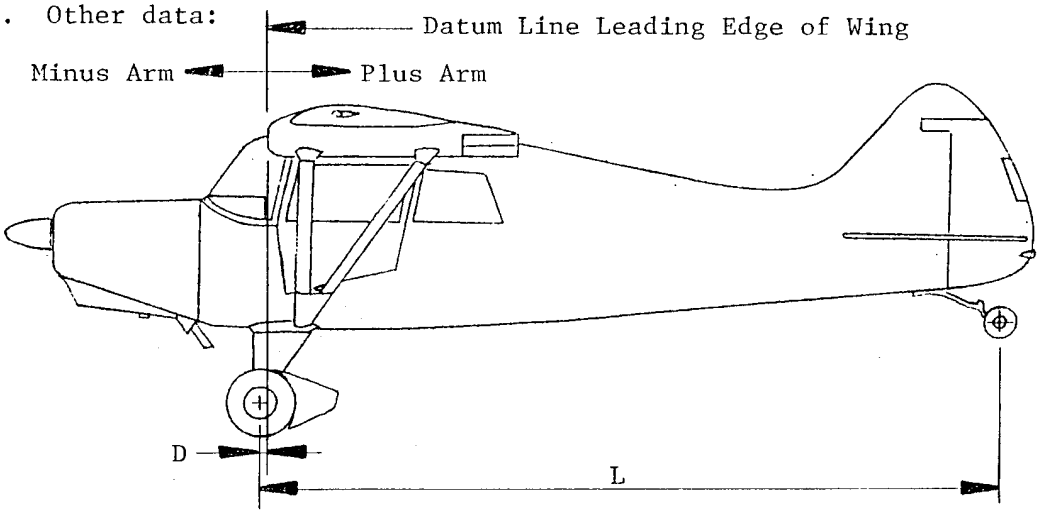
C. ENGINE FIRE

1. Fuel Selector Valve.....OFF
2. Throttle.....FULL OPEN
3. Ignition Switch.....OFF
4. Cabin Vent and Heat Controls.....CLOSED
5. Window Vents.....CLOSED
6. LAND AS SOON AS POSSIBLE

WEIGHT AND BALANCE DATA

Aircraft Reg. No._____ Serial No._____ Landplane / Ski Plane

1. Level airplane using the leveling lug and mark on bottom of right wing at root end. (Distance between lug and mark is 31 inches.)
2. Datum is at the leading edge of wing.
3. Other data:



(L) Wheel Base (actual measured horizontal distance from the rear wheel weight point (centerline of rear wheel) to the main wheel weight point_____inches.

(D) Actual measured horizontal distance from the main wheel weight point (L main wheel) to the datum_____inches.

4. Weight:

Right main wheel----------_____lbs.

Left main wheel----------_____lbs.

(T) Tailwheel_____lbs. - tare_____lbs. =_____lbs.

(W) Total empty weight_____lbs.

(The above empty weight shall include unusable fuel of 4 lbs at 24 inches, unusable oil of 7.5 lbs. at -37.0 inches and all items of equipment marked with an "X" on the attached equipment list.)

5. Solving for empty weight and center of gravity:

$$C.G. = \frac{T \times L}{W} - D$$

$$C.G. = \frac{\quad x \quad}{\quad} -$$

C.G. = _____inches

6. Conclusive data:

A. Empty Weight is_____lbs. Moment_____in. lbs.

B. Empty Weight Center of gravity is at_____inches.

C. Useful load is_____lbs.

7. For aircraft loading and corresponding center of gravity locations use Weight and Balance Information, Pages 1, 2, 3.

8. Center of gravity range:

a. Land Plane: (15.0) to (23.0) at 2100 lbs.

(11.0) to (23.0) at 1400 lbs. or less

b. Ski Plane: (13.0) to (23.0) at 1850 lbs.

(10.6) to (23.0) at 1550 lbs. or less

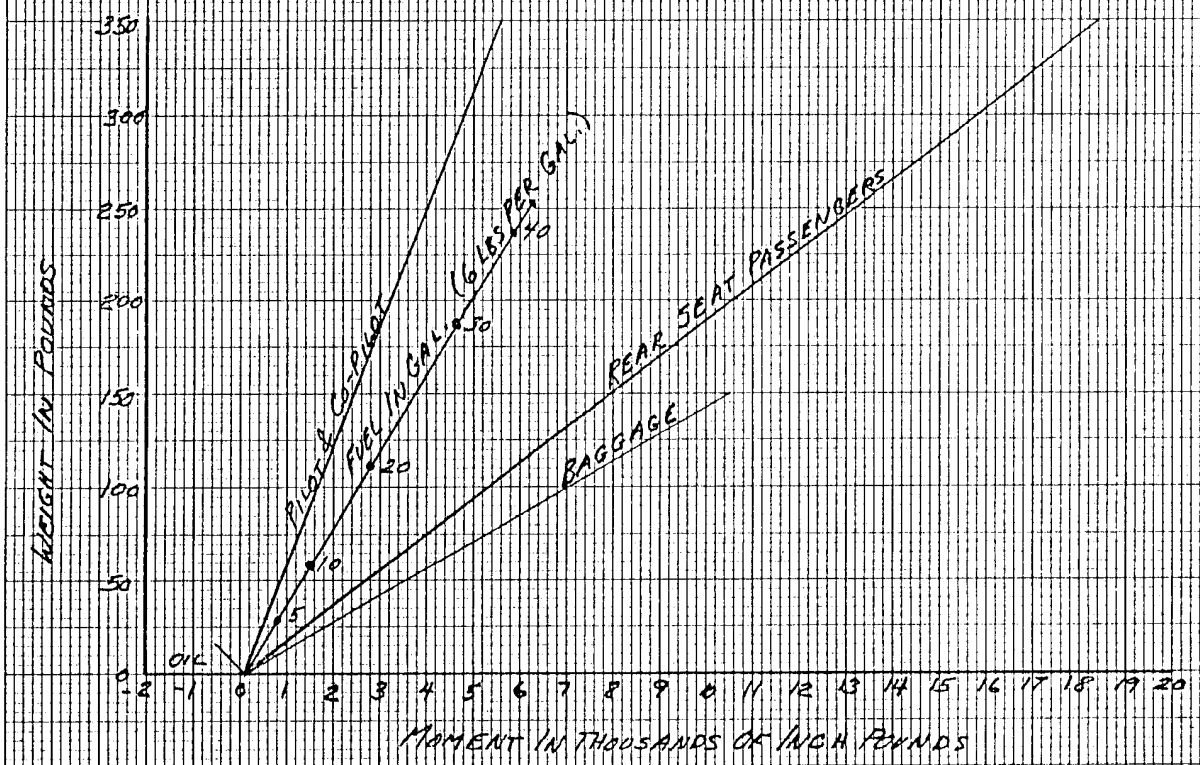
Straight line variation between points.

NOTE: (Ski Plane empty weight and center of gravity will be done with the skis in the wheel position).

Checked by_____Date_____

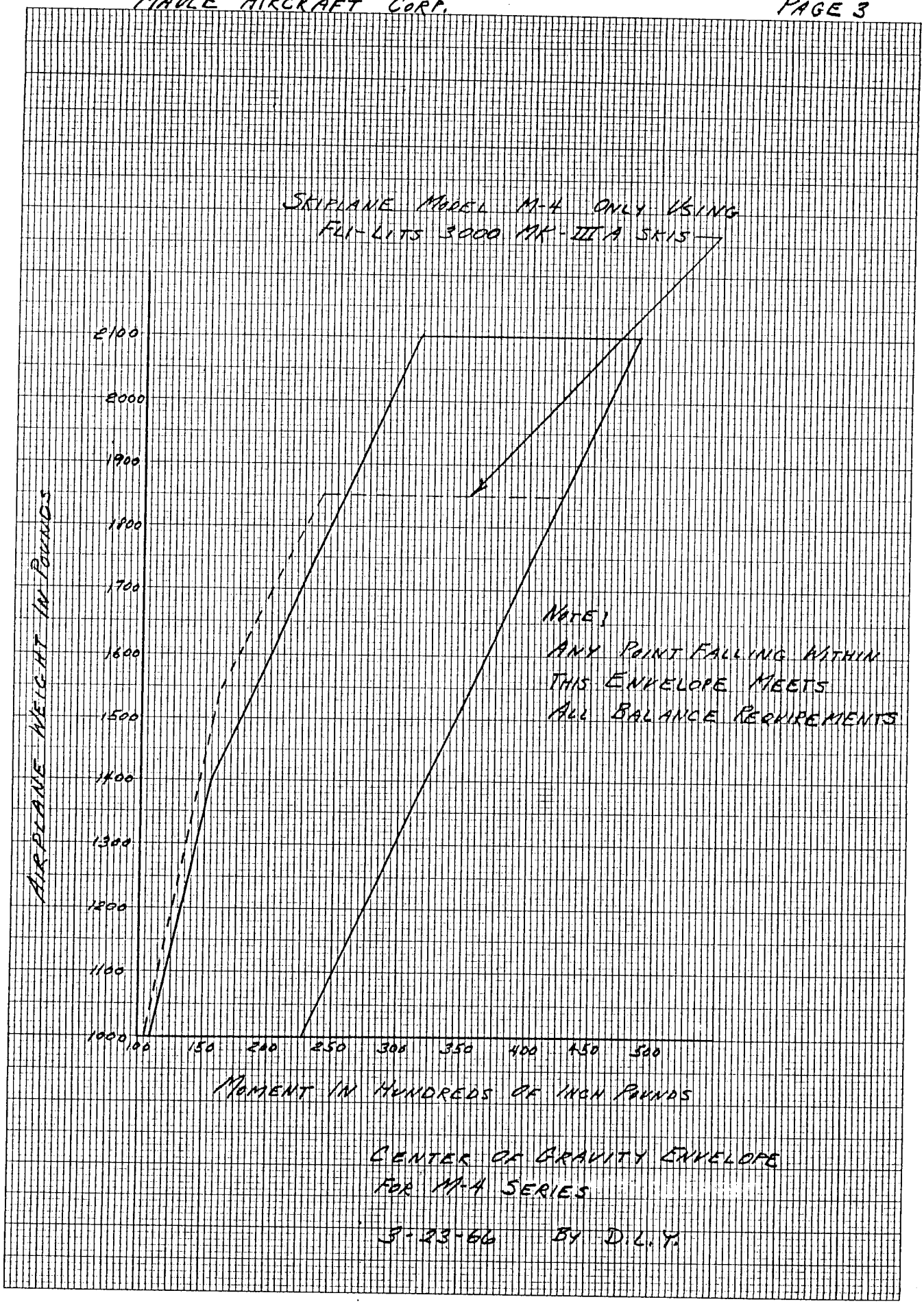
NOTES;

1. ADD WEIGHT OF ITEMS TO BE CARRIED TO THE LICENSED EMPTY WEIGHT OF THE AIRPLANE.
2. ADD MOMENTS IN THOUSANDS OF INCH POUNDS OF THESE ITEMS TO THE TOTAL AIRPLANE MOMENT IN THOUSAND OF INCH POUNDS.
3. FIND POINT ON CENTER OF GRAVITY ENVELOPE ON PAGE 3.



LOADING GRAPH FOR STANDARD MODEL
MODELS M-4, M-4S, M-4-210 & M-4-210S

6-13-66 BY D.L.



SERIAL NO._____ REG. NO._____ MODEL_____

EQUIPMENT CHANGE - WEIGHT AND BALANCE

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

A. New Empty Weight_____ lbs.

B. New Empty Center of Gravity_____ inches

C. New Empty Weight C.G. Moment_____ in. lbs.

D. New Useful Load_____ lbs.

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

BY_____ DATE_____