MAULE AIRCRAFT CORPORATION

Moultrie, Georgia

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

FOR

MAULE M-5-210TC

Airplane Serial No. _____

FAA Registration No. _____

THIS DOCUMENT MUST BE KEPT IN THE AIRPLANE AT ALL TIMES

FAA APPROVED: John R. James

Acting Chief, Engineering and Manufacturing Branch

DATE: Feb. 4, 1980

LOG OF REVISIONS

REV.	DESCRIPTION	APPROVAL AND DATE
A	Changed all references to Carburetor Heat and Alternate Air to Carburetor Air Control.	Keith D. Blythe Chief, Engineering and Manufacturing Branch, FAA, Southern Region Date: 4-14-81
B	In SECTION II, EXTERIOR PREFLIGHT INSPECTION, added 18a. and revised 5. to include draining of the Main Fuel Tank sumps.	John R. James Manager, Atlanta Aircraft Certification Office FAA, Central Region Date: May 1, 1984

LOG OF SUPPLEMENTS

SUPP NO.	NO. OF PAGES	DESCRIPTION	APPROVAL DATE
1	2	Installation of **20°/40°** Flap Ratchet (@ 2300# GW) – Maule Service Letter No. **47**.	03/11/83
2	2	Operation of aircraft @ **2500# GW** and Installation of **20°/40°** Flap Ratchet – Maule Modification Kit No. **21**.	12/16/98
3	2	Installation of Lamar **Alternator Control** System.	10/10/06
4	3	Installation of **Fli-Lite** Model **3000 MK IIIA Skis** – Maule Drawing **9079A**.	06/20/80
-	2	Installation of **2110X-30 Wing Assemblies** with **2167X** Main Fuel Tanks - Modification Kit No. **15**.	10/08/96
-	4	Installation of **Aqua 2200 Floats** - STC SA00758CH.	09/18/97
-	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
-	3	Operation of aircraft when a **5th** passenger **Seat** is installed in rear cabin - Maule **Modification Kit No. 8**.	09/02/97
-	3	Operation of aircraft when Micro AeroDynamics **Vortex Generator System** is installed per Maule Drawing **9177A**.	12/16/05

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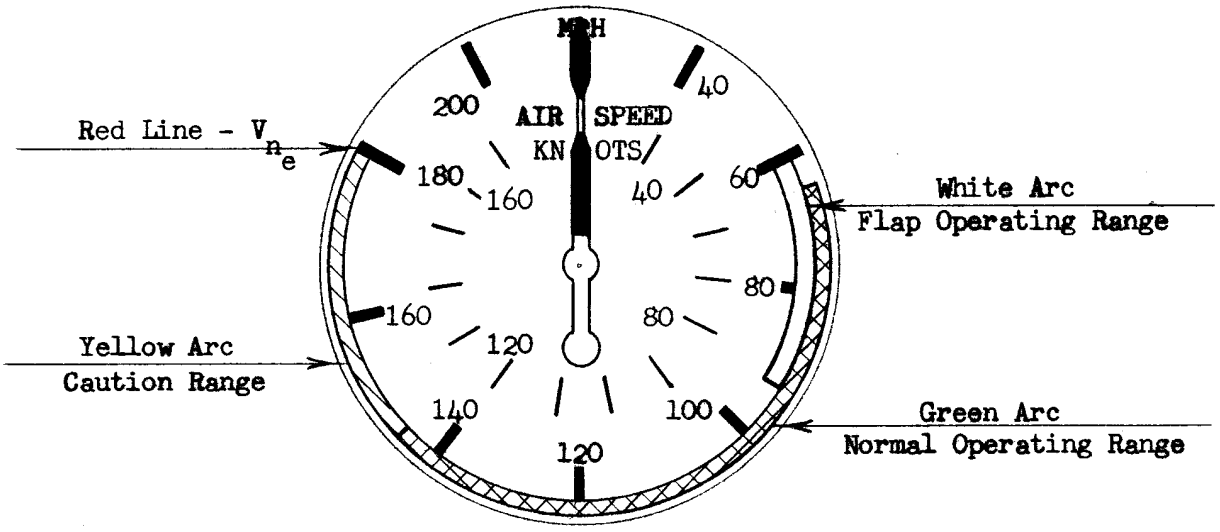
SECTION I

OPERATING LIMITATIONS

AIRSPEED LIMITS: All airspeeds are calibrated airspeeds.

AIRSPEED INDICATOR MARKINGS:



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): Extends from design cruise speed (V_c) to never exceed speed. 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, 65-145 mph (57-126K): Extends from flaps up, power off stall speed at 2300 lbs. (V_{S1}) to design cruise speed.

White Arc - Flap Operating Range, 60-94 mph (52-82K): Extends from full flap, power off stall speed at 2300 lbs. (V_{so}) to the maximum flaps extended speed (V_{fe}).

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

POWER PLANT LIMITS:

Engine: Lycoming TO-360-F1A6D

Engine Limits: 210 hp @ 2575 RPM, Full Throttle Continuous @ 42.0 Hg MP

Propeller: Hartzell HC-E2YR-1BF/F8467-7R

Fuel: 100/130 Minimum Grade Aviation Gasoline

Engine Instrument Markings:

Cylinder Head Temperature:	Green Arc- Normal Operating Range, 200°F -435°F.
	Red Radial - Operating Limit, 500°F
Oil Temperature:	Green Arc - Normal Operating Range, 140°F-245°F.
	Red Radial - Operating Limit, 245°F.
Oil Pressure:	Green Arc - Normal Operating Range, 50 to 90 psi.
	Yellow Arc - Caution Range, 25 to 50 psi and 90 to 115 psi.
	Red Radial - Minimum Operating Pressure 25 psi.
	Red Radial - Maximum Operating Pressure, 115 psi.
Manifold Pressure:	Red Radial - Maximum 42" Hg. (See RPM verses Manifold Pressure placard)
Fuel Pressure:	Green Arc - Normal Operating Range, 15 to 30 psi.
	Red Radial - Minimum Pressure, 15 psi.
	Red Radial - Maximum Pressure, 30 psi.
Tachometer:	Green Arc - Normal Operating Range, 2200 - 2575 RPM

Tachometer: (con't) Red Radial - Maximum RPM, 2575 RPM

Turbine Inlet Temp. Red Radial - Max. Temp 1725°F

MAXIMUM OPERATING ALTITUDE: 20,000 FT.

MAXIMUM WEIGHT: 2300 Pounds

CENTER OF GRAVITY LIMITS: + 15.0 to 20.5 inches @2300#

+ 12.0 to 20.5 inches @1700 # 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 the Weight and Balance Data for baggage/cargo loading recommendations and loading graphs.

MANEUVERS: Only normal Category Maneuvers, including Lazy Eights and Chandell involving bank angles not greater than 60°, stalls (except whip stall), and any maneuver incident to normal flying are approved in this airplane.

CAUTION ——— AEROBATICS AND SPINS PROHIBITED.

FLIGHT LOAD FACTORS: FLAPS UP- 3.8g Positive to 1.5g Negative
FLAPS DOWN- 1.9g Positive

FUEL CAPACITY: MAIN TANKS- 21.5 GAL. ea., OPTIONAL AUXILIARY TANKS- 11.5 GAL.ea.

UNUSABLE FUEL: 1.5 Gallons per main tank.

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

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 OPERATING LIMITATIONS STATED IN THE AIRPLANE FLIGHT MANUAL AND IN THE FORM OF PLACARDS AND MARKINGS "

" NO AEROBATIC MANEUVERS, INCLUDING SPINS, ARE APPROVED "

" ROUGH. AIR OR MANEUVERING SPEED: 125 mph (109K) C.A.S. "

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

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

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

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

" NOT MORE THAN 34" OF MANIFOLD PRESSURE AT PROPELLER SPEEDS LESS THAN 2350 RPM "

" NOT LESS THAN 20" OF MANIFOLD PRESSURE AT PROPELLER SPEEDS BETWEEN 2250 AND 2450 RPM "

The following placards are located next to the fuel filler caps on the top of the wing.

Inboard tanks: "FUEL - 100/130 OCTANE - 21.5 GAL "

Outboard tanks: (If installed) "FUEL - 100/130 OCTANE - 11.5 GAL "

SECTION II

NORMAL OPERATING PROCEDURES:

PREFLIGHT INSPECTION:

Before entering aircraft.....REMOVE CONTROL LOCKS

INTERIOR:

1. All Electrical Switches.....OFF

2. Master Switch.....ON

3. Fuel Gauges.....CHECK INDICATIONS

4. Master Switch.....OFF

5. Flaps.....FULL DOWN

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.

EXTERIOR:(con't)

1. Fuel drains behind left step.....DRAIN TO CHECK FOR WATER

2. Left Flap.....CHECK HINGES & CONTROL ATTACHMENT

NOTE: Main fuel tank drains (Lowest part of the fuel system) are located behind the step on the left side, front drain is left tank, rear drain is right tank. Auxiliary tank drains are flush valves located at the rear of each tank.

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 TO CHECK FOR WATER (2)
6. Wing Tip and Nav. Light.....CHECK FOR DAMAGE
7. Auxiliary Fuel Tanks.....VISUALLY CHECK QUANTITY
8. Landing Light.....CHECK FOR DAMAGE
9. Wing Tiedown.....REMOVE
10. Stall Warning Switch.....CHECK FOR FREEDOM OF MOVEMENT
11. Main Fuel Tank.....VISUALLY CHECK QUANTITY
12. Left Main Gear.....CHECK TIRE INFLATION AND BRAKE LINE SECURITY
13. Bottom left side of cowl.....DRAIN GASCOLATOR (1)
14. Top Cowl; Oil access Door.....CHECK OIL QUANTITY: 5 QTS. MIN., 8 QTS. MAX.
15. Propeller.....CHECK LEADING EDGE FOR DAMAGE
16. Air Inlets.....CHECK FOR FOREIGN OBJECTS, INSPECT VISIBLE CONNECTIONS AND COMPONENTS.
17. Right Landing Gear.....CHECK TIRE INFLATION AND BRAKE LINE SECURITY
18. Right Wing and Controls.....INSPECT SAME AS LEFT WING

18a. Wing Main & Aux Fuel Tank Drains....DRAIN (2)

19. Right Fuselage side and Top.....INSPECT FOR WRINKLES AS INDICATION OF INTERNAL DAMAGE
20. Right Stabilizer.....CHECK ATTACHMENT POINTS AND STRUT
21. Right Elevator.....CHECK HINGE POINTS
22. Rudder.....CHECK HINGE POINTS, CONTROL ATTACHMENTS, NAV. LIGHT

EXTERIOR: (con't)

23. Tailwheel.....CHECK INFLATION, ATTACHMENTS, REMOVE TIE-DOWN
24. Left Elevator.....CHECK TAB CONTROLS AND ALL HINGE POINTS
25. Left Stabilizer.....CHECK ATTACHMENT AND STRUT
26. Left Fuselage side & Bottom.....CHECK FOR WRINKLES AS INDICATION OF INTERNAL DAMAGE

OPERATING CHECK LISTS:

BEFORE STARTING:

1. Seat Belts.....FASTEN
2. Flaps.....UP
3. Circuit Breakers.....CHECK

STARTING:

1. Mixture Control.....FULL RICH
2. Primer Pump.....AS REQUIRED
3. Throttle.....CRACK OPEN
4. Propeller Control.....FULL INCREASE
5. Master Switch.....ON
6. Propeller Area.....CHECK AND WARN CLEAR
7. Parking or Toe Brakes.....ON
8. Starter Switch.....TWIST FULL RIGHT TO ENGAGE
9. After Starting.....CHECK OIL PRESSURE

CAUTION — IF OIL PRESSURE DOES NOT EXCEED 25 psi WITHIN 30 SECONDS, SHUT DOWN ENGINE

10. Alternator Switch.....ON
11. Anti-Collision Light.....ON
12. Radios and other Electricals.....AS REQUIRED
13. Parking Brake.....OFF

WARNING — IN EVENT OF ENGINE FIRE DURING START, MIXTURE-FULL LEAN, THROTTLE OPEN, CONTINUE CRANKING SEVERAL REVOLUTIONS, ACCOMPLISH ENGINE EMERGENCY SHUT DOWN. MASTER SWITCH OFF.

ENGINE CHECK:

1. Parking Brake.....ON, IF DESIRED
2. Throttle.....INCREASE TO 2000 RPM
3. Magnetos.....SWITCH TO RIGHT, BOTH, LEFT, BOTH, CHECKING RPM DROPS

CAUTION — MAXIMUM RPM DROP IS 175 RPM. MAXIMUM ALLOWABLE DIFFERENTIAL IS 50 RPM.

4. Propeller Control.....RETARD FULLY UNTIL RPM DROP IS NOTED. REPEAT
5. Carburetor Air Control.....PULL, HOT

NOTE — NORMAL RPM DROP WITH CARBURETOR HEATER ON IS 150

6. Engine Gauges.....CHECK IN GREEN
7. Carburetor Air Control.....PUSH , COLD
8. Throttle.....RETARD TO IDLE

BEFORE TAKEOFF:

1. Fuel Selector.....ON FULLEST TANK
2. Flaps.....AS DESIRED
3. Trim Control.....TAKEOFF POSITION
4. Flight Controls.....CHECK FOR FREEDOM AND FULL TRAVEL
5. Mixture Control.....FULL RICH
6. Propeller Control.....FULL INCREASE

BEFORE TAKEOFF (Con't)

7. Carburetor Air Control.....PUSH - COLD
8. Vacuum Gauge.....CHECK IN GREEN
9. Engine Instruments.....RECHECK IN NORMAL RANGE
10. Fuel Gauges.....RECHECK QUANTITY
11. Avionics.....AS DESIRED
12. Altimeter.....SET
13. Directional Gyro.....SET
14. Seatbelts.....RECHECK FASTENED
15. Doors.....CLOSED AND LOCKED

NOTE: ALL CLIMBS TO ALTITUDE SHOULD BE FULL RICH MIXTURE.

NOTE: MIXTURE LEANING PROCEDURE:

LEANING TO TURBINE INLET TEMPERATURE GAGE.

1. Best Economy Cruise- Lean to peak turbine inlet temperature (TIT) or 1725°F., whichever occurs first.

2. Maximum Power Cruise- The engine must always be operated on the rich side of peak TIT. Before leaning to obtain maximum power mixture it is necessary to establish a reference point. This is accomplished as follows:

   a. Establish a peak TIT for best economy operation at the highest economy cruise power without exceeding 1725°F. TIT.

   b. Deduct 125°F. from this temperature and thus establish the temperature reference point for use when operating at maximum power mixture.

   c. Return mixture control to full rich and adjust the RPM and manifold pressure for desired performance cruise operation.

   d. Lean out mixture until TIT is the value established in Step b. This sets the mixture at best power.

CAUTION — TAKE-OFF WITH A TURBOCHARGED ENGINE SHOULD NOT BE STARTED IF INDICATED LUBRICATING OIL PRESSURE, DUE TO COLD TEMPERATURE IS ABOVE MAXIMUM, EXCESSIVE OIL PRESSURE CAN CAUSE OVER-BOOST AND CONSEQUENT ENGINE DAMAGE.

CAUTION — AVOID RAPID OPENING AND CLOSING OF THE THROTTLE. THERE IS A POSSIBILITY OF DETUNING THE COUNTER WEIGHTS WITH SUBSEQUENT ENGINE DAMAGE.

LANDING CHECKLIST:

1. Mixture Control.....FULL RICH
2. Fuel Selector Valve.....ON FULLEST TANK
3. Propeller Control.....FULL INCREASE
4. Flaps.....AS REQUIRED
5. Carburetor Air Control.....PULL - HOT WHEN AT IDLE
6. Seat Belts.....TIGHTEN
7. Trim.....AS REQUIRED

SHUT DOWN CHECKLIST:

1. Avionics.....OFF
2. Anti-Collision Light.....OFF
3. All Other Electrical Switches.....OFF
4. Flaps.....UP
5. Parking Brake.....ON, IF DESIRED

TO STOP ENGINE:

6. Mixture Control.....FULL LEAN
7. Magneto Switch (After Prop Stops).....OFF
8. Master Switch.....OFF

NORMAL FLIGHT OPERATIONS:

FLAP SETTINGS:

Normal Takeoff - 0^{o} (No Flaps) 15° (First Notch) flaps permissible for takeoff.

Short, Rough, Soft Field Takeoff - 35° (Second Notch) until safety airborne, then retract to 15°.

Normal Climb - 0^{o}

Best Angle Climb - 15°

Landing - 35° (0^{o} or 15° permissible).

Climbing:

Best rate of Climb - 90 mph CAS, no flaps

Best angle of climb - 75 mph CAS, 15° flaps.

CAUTION — CLIMB BELOW 100 MPH ONLY AS NECESSARY AND CHECK CYLINDER HEAD TEMPERATURE FREQUENTLY WHEN DOING SO.

RUDDER TRIM:

Rudder trim can be adjusted in the right direction only. It is most useful during takeoff and climb to reduce the right rudder pedal load and is to be used at the pilot's discretion.

STALLS:

Stalls are clean and predictable, with little or no pre-stall buffet. Loss of altitude prior to recovery from a stall may be as much as 200 feet. The red stall warning light on the instrument panel will illuminate at 5 to 10 mph above the stall speed.

CAUTION — THE STALL WARNING LIGHT IS INOPERATIVE WHEN THE MASTER SWITCH IS OFF.

LANDINGS AND TAKEOFFS:

Maximum demonstrated 90^{o} crosswind component is 14 mph.

FUEL SYSTEM:

Fuel is fed only from the main (inboard) tanks, and is controlled by the selector valve on the left kick panel. Optional wing tip tanks (if installed)feed their respective main tanks via tranfer pumps, which are

FUEL SYSTEM: (Con't)

controlled by switches on the instrument panel. These transfer pumps transfer fuel at a rate of .4 gallons per minute or approximately one half hour for a full auxiliary tank. Since over-filling a main tank from an auxiliary tank will force excess fuel overboard, the transfer pumps should not be activated until their respective main tanks are less than 1/2 full.

DOOR-OFF OPERATION:

This aircraft may be operated with the rear passenger door or rear passenger and baggage doors off. When doing so, observe the following additional limitations.

1. Maximum airspeed - 125 mph
2. Maximum bank angle - 30^{o}
3. Maximum yaw angle - 10^{o}
4. No smoking permitted
5. Limit flight to VFR conditions

NOISE LEVEL:

No determination has been made by the Federal Aviation Administration that the noise level of this airplane is, or should be acceptable or unacceptable for operation at, into, or out of any airport. The noise level obtained during certification, per FAR-36, was dBA 73.6 This was determined under the following conditions: Gross Wt. 2300#, 2575 RPM., full throttle.

USE OF CARBURETOR AIR CONTROL:

Normal Flight:

At cruise power or above, the turbocharger should supply sufficient heat to prevent ice formation, however, such as during let down or landing approach it is possible for ice to form, and the use of the carburetor air control to provide carburetor heat may be necessary.

Traffic Pattern:

If icing conditions are suspected, prior to power reduction, pull carburetor air control to full hot position. This allows the engine to draw air from within the engine compartment. Leave the carburetor air control in the "Hot" position throughout the landing.

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

SECTION III
EMERGENCY PROCEDURES:

SPIN RECOVERY:

Intentional spins are prohibited. If the aircraft inadvertently enters a spin immediately use opposite rudder and neutral ailerons, followed closely by down elevator, for recovery.

ALTERNATOR FAILURE:

If the alternator should become inoperative, the red "Overvoltage Relay" switch will illuminate. Your electrical system is protected by an over-voltage relay, and this relay may have been tripped by a voltage "Spike". To reset this relay, push the bottom of the switch. If this fails to bring the alternator back on the line, or if the relay repeatedly trips, reduce electrical load as much as possible and land as soon as practicable, since all electrical power is being supplied by the battey.

ENGINE EMERGENCY SHUT DOWN:

1. Mixture.....FULL LEAN/IDLE CUTOFF
2. Fuel Selector.....OFF
3. Ignition Switch.....OFF

NOTE: THE OVERVOLTAGE RELAY WARNING LIGHT WILL NOT OPERATE WHEN THE MASTER SWITCH IS OFF

EMERGENCY CHECK LISTS:

ENGINE FAILURE:

1. Mixture Control.....FULL RICH
2. Carburetor Air Control.....PULL HOT

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

3. Fuel Selector Valve.....ON FULLEST TANK
4. Boost Pump.....ON

5. Propeller Control.....FULL INCREASE

NOTE ——— PROPELLER MAY NOT WINDMILL BELOW 70 MPH

6. Auxiliary Tank Pump.....ON FOR TANK FEEDING ENGINE, IF AUXILIARY TANK HAS FUEL.

FORCED LANDING:

1. Airspeed.....MAINTAIN AIRCRAFT CONTROL

2. Flaps.....UP FOR BEST GLIDE, AS NECESSARY FOR LANDING

3. Seat Belts.....TIGHTEN

4. Loose Objects.....STOW

5. Fuel Selector Valve.....OFF

6. Master and Magneto Switches.....OFF JUST PRIOR TO LANDING

ENGINE FIRE IN FLIGHT:

1. Fuel Selector Valve.....OFF

2. Throttle.....FULL OPEN

3. Magneto Switch.....OFF

4. Cabin Vent and Heat Controls.....CLOSED

5. Window Vents.....CLOSED

6. LAND AS SOON AS PRACTICABLE.

SECTION IV
WEIGHT AND BALANCE CONTROL
Equipment List: Required and Optional
Weight and Balance Data Form