

MARK 21

MODEL M 20 C

OPERATE THIS AIRCRAFT ONLY – ① after reading
owners manual ② with owners manual on board
③ after you are fully qualified & understand all of
the aircraft operating characteristics & limitations



OWNERS MANUAL

1962 - 1963 - 1964
DATA INCLUDED

1965

MOONEY AIRCRAFT, INC.



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NOTE: Information in the 1965 MARK 21 owner's manual also applies to the 1962 through 1964 models with the exceptions noted on this insert.

The following serial numbers of the M 20 C are affected:

MODEL	YEAR	SERIAL NUMBER
M 20 C	1962	1852, 1940 thru 2207, 2209 thru 2255, 2257 thru 2296
M 20 C	1963	2208, 2256, 2297 thru 2622
M 20 C	1964	2 623 thru 2741, 2743 thru 2806
M 20 C	1965	2742, 2807 thru 3184

Supplement to the 1965 MARK 21 (M 20 C) owners manual

PART I DESCRIPTION AND OPERATION OF COMPONENTS

FUEL SYSTEM (Reference page 3)

The fuel tank capacity of the 1962 and 1963 Mark 21 is 24 gallons per wing tank or 48 gallons total fuel. The '62 and '63 models do not have a pull ring to drain the fuel selector sump from the cabin. In these models the selector sump is drained from outside using the same procedure recommended for draining the wing tanks. 1962 and 1963 models have a gascolator in the nose wheel well which can be inspected and drained from outside the aircraft.

LANDING GEAR: (Reference page 6)

The thumb operated safety latch for the landing gear retraction lever has not been factory installed on serial numbers 1852, 1940 through 2050.

FUEL SYSTEM

Fuel is contained in two integral sealed sections in the front part of each wing root. Each tank will hold 26 gallons of gasoline. These fuel tanks each have a sump drain under the wing from which fuel may be sampled to check for water or sediment contamination. A small plastic cup with an actuator prong is provided to obtain fuel samples. If water is present in the fuel, a distinct line separating the water from the gasoline may be seen through the plastic cup. Water, being heavier, will be on the bottom of the cup, and the light-colored fuel will be on top.

Aluminum fuel lines feed the fuel from the tank to a two-way, positive-setting selector valve on the floor ahead of the pilot's seat. The selector valve feeds fuel from one of the tanks at a time, and also has an "off" position for extended periods of storage or for emergency use. The selector valve also contains a sump drain which is actuated by pulling the ring adjacent to the fuel valve handle. Switch the selector valve handle to the right and left tanks to drain the respective lines. Be sure sump drain returns to normal closed position after releasing the ring. Fuel is fed from the selector valve through the electric boost pump, then to the engine driven pump and into the carburetor. The electric boost pump is turned on for take-off and landing to provide fuel pressure if the engine driven pump malfunctions.

WARNING: Under no circumstances should aviation fuel of a lower grade than 91/98 octane be used. Aviation fuels may distinguished by their color: 80 octane is red, 91 octane is blue, and 100 octane is green. If 91/98 octane is not available, 100/130 octane gasoline may be used.

THE ELECTRICAL SYSTEM

The Mark 21 electrical system is provided with a 50 amp 12 volt generator and a 35 amp-hour battery which is located on the forward left side of the firewall. All electrical systems can

PRE-FLIGHT INSPECTION

The following pre-flight inspection is recommended:

1. Check all switches off.
2. Remove tiedowns or wheel blocks, check tires and prop clear of rocks, holes, etc.
3. Check wings and control surfaces clear of ice, snow, or frost.
4. Check the propeller blades for nicks or cracks.
5. Check the oil level to six quarts or above.
6. Inspect the cowling for loose attachments.
7. Inspect the tires for proper inflation.
8. Inspect the air filters for cleanliness.
9. Check the left tank for fuel level and drain sump.
10. Check the left aileron for freedom of travel.
11. Inspect the left flap.
12. Inspect the elevator and rudder for freedom of travel. (Rudder travel will be limited by nose gear steering mechanism.)
13. Inspect the right flap.
14. Inspect the right aileron for freedom of travel.
15. Check the right fuel tank for fuel level and drain sump.
16. Check lights if flight is at night.

ENTERING THE AIRPLANE

After entering the cabin, close the door by pulling on the pull strap and rotating the handle forward to the latched position. DO NOT SLAM THE DOOR. Check that the gear retraction handle (or electric gear switch) is in the gear down and locked position. Drain the fuel selector valve on the floorboard and turn the selector to the proper tank. Be sure the drain returns to "OFF" position and that the pull ring is properly positioned in the cavity provided. If the flight is at night, check to assure a flashlight is on board.

STARTING THE ENGINE

The following starting procedures are recommended; however, the starting characteristics of each engine may vary slightly

TAXIING AND GROUND OPERATION

The nose gear of the Mark 21 is linked directly to the rudder pedals to provide steering. The brakes may be applied independently to assist steering for sharper turns.

Caution should be used when operating on rough terrain. It is recommended that minimum power be used for starting to taxi on sod or gravel fields. Too much power will cause the propeller to suck up stones and thus nick the blades. Excessive speed over rough ground should be avoided to preclude pitch down of the nose.

The Lycoming O-360-A1D is an air pressure cooled engine that depends on the forward speed of the airplane to maintain proper cooling. It is recommended that the following precautions be observed for proper engine cooling:

1. When stopped, head the airplane into the wind.
2. Operate the engine on the ground only with the propeller in high rpm setting (control forward).
3. Keep mixture "Full Rich" (control forward).
4. Do not overheat engine by prolonged ground running. Monitor the cylinder head temperature gauge.

PRE TAKE-OFF CHECK

When operating on gravel fields, it is recommended that the run-up be made while taxiing to avoid nicking the propeller. Warm up the engine at 1000 to 1200 rpm. Avoid prolonged idling at low engine speeds as this practice may result in fouled spark plugs. The engine is warm enough for take-off when it can develop full rpm and the throttle can be opened without backfiring or skipping of the engine or the throttle can be opened without a reduction in oil pressure.

Check the following items before take-off:

1. Check flight controls for travel and smoothness of operation.
2. Check fuel quantity indicator, selector valve, and fuel pressure.
3. Check instruments.
 - a. Set altimeter to field elevation.

- b. Check oil pressure and temperature.
 - c. Check electrical load meter for indication (at 1200 rpm or greater, operation of any electrical equipment should give an indication).
 - d. Check cylinder head temperature.
 - e. Set clock.
 - f. Check manifold pressure gauge and tachometer for readings proportional to engine power.
 - g. Check rate of climb, airspeed, and turn and bank indicator for zero readings.
 - h. Check artificial horizon and directional gyros for proper orientation.
 - i. Test gear indicator lights and vacuum warning lights.
 - 4. Set trim to take-off setting (see indicator).
 - 5. Check cowl flaps open.
 - 6. Set wing flaps to take-off setting (see indicator).
 - 7. Turn on boost pump.
 - 8. Check magnetos at 1700 RPM for smooth operation and maximum drop of 125 RPM.
- NOTE: If one magneto runs rough, turn the switch back to the "both" position and reduce the power to 800 RPM. Allow the engine to run for a minute and then slowly increase the power to 2200 RPM and recheck the magnetos. This operation will usually burn out the carbon deposits and allow the magnetos to check properly.
- 9. Exercise the propeller at 1800-2000 RPM by pulling the propeller control to the "full-out" position. After the tachometer has shown a drop-off of 100 RPM, push the propeller control to the "full-in" position.
 - 10. Check mixture rich (full forward).
 - 11. Check lights if flight is at night.
 - 12. Check all seat belts.
 - 13. Close door and pilot window and latch shut.
 - 14. Clear floor for retraction handle clearance.