TABLE OF CONTENTS

INTRODUCTION

SECTION II includes the mandatory operating limitations, instrument markings, and basic placards necessary for the safe operation of the airplane, its engine, standard systems and standard equipment.

The limitations included in this section have been approved by the Federal Aviation Administration.

When applicable, limitations associated with optional systems or equipment such as autopilots, avionics systems or other options are included in SECTION IX in the applicable AFM Supplements.

| NOTE |

The airspeeds listed in the Airspeed Limitations chart (Figure 2-1) and the Airspeed Indicator Markings chart Figure 2-2) are based on Airspeed Calibration data shown in Section V with the normal static source. If the alternate static source is being used, ample margins should be observed to allow for the airspeed calibration variations between the normal and alternate static sources as shown in SECTION V.

Your Mooney is certificated under FAA Type Certificate No. 2A3 as a Mooney M20K.

NOISE LIMITS

The certificated noise level for the M20K at 3130 lbs. (1420 Kg.) maximum weight is dB(A) as determined per FAR 36, Appendix G. No determination has been made by the Federal Aviation Administration that the noise levels of this airplane are or should be acceptable or unacceptable for operation at, into, or out of, any airport.

AIRSPEED LIMITATIONS

Airspeed limitations and their operational significance are shown in Figure 2-1. This calibration assumes zero instrument error.

	— SPEED —	KCAS/KIAS	REMARKS
V_{ne}	Never Exceed Speed	195/195	DO NOT exceed this speed.
V_{no}	Structural Cruising Speed (Maximum)	174/174	DO NOT exceed this speed except in smooth air, and then with caution.
V_a	Maneuvering Speed at: Lb./Kg.		DO NOT make full or abrupt control movements above this speed.
	2092/949	99/101	
	2250/1021	103/104	
	2900/1315	117/118	
	3130/1420	122/123	
V_{fe}	Flap Extension Speed (Maximum)	109/112	DO NOT exceed these speeds with flaps full down.
V_{le}	Landing Gear Extended Speed (Maximum)	165/165	DO NOT exceed this speed with Ldg. Gr. extended.
V_{lo} (Ext)	Gear Extend	139/140	Max Speed at which landing gear can be safely extended.
V_{lo} (Ret)	Gear Retract	104/106	Max Speed at which landing gear can be safely retracted.
	Pilot Window Open Speed (Maximum)	130/132	DO NOT exceed this speed with pilot window open.

FIGURE 2-1 AIRSPEED LIMITATIONS

AIRSPEED INDICATOR MARKINGS

Airspeed indicator markings, their color code and operational significance are shown in Figure 2-2.

MARKING	IAS VALUE OR RANGE (KIAS)	SIGNIFICANCE
White Arc (Flap Operating Range)	61 - 112	Lower limit is maximum weight V_{so} at most fwd CG in landing configuration. Upper limit is maximum speed permissible with full flaps extension
Green Arc (Normal Operating Range)	67 - 174	Lower limit is maximum weight V_s at most fwd. CG with flaps retracted. Upper limit is maximum structural cruising speed.
Yellow Arc (Caution Range)	174 - 196	Operations must be conducted with caution and only in smooth air.
Red Line	196	Maximum speed for all operations.

FIGURE 2-2 AIRSPEED INDICATOR MARKINGS

POWER PLANT LIMITATIONS

Number of Engines 1

Engine Manufacturer . . . . . Teledyne Continental Motors (TCM)

Engine Model Number . . . . . TSIO-360-SB( ) *

Engine Operating Limits for Takeoff and Continuous Operations:

Maximum Continuous Power	220 BHP
Maximum Continuous RPM	2600
Maximum Manifold Pressure	39.0 In. Hg
Maximum Turbine Inlet Temperature (TIT) Continuous	1650° F
Maximum Turbine Inlet Temperature (TIT) Transient (< 30 seconds)	1700° F
Max. Cylinder Head Temperature	460° F (238° C)
Maximum Oil Temperature	240° F (116° C)
Minimum Oil Temp-Grnd. Run up	75° F (24° C)
Minimum Oil Temp-Takeoff	100° F (38°)

* Refer to TCDS for engine configuration required.

Oil Pressure

Normal Operating	30-80-PSI
Minimum (IDLE ONLY)	10 PSI
Maximum (cold oil)	100 PSI

Oil Specification . . . . . MHS-24( ), MHS-25( ) and TCM approved oils.

Fuel flow — Maximum Continuous Horsepower (MCP) -

(Mixture Control FULL RICH at climb critical altitude -NASA Standard Day Temp.)

Minimum	—-(100LL) XX.X GPH (1XX lbs/hr) **
Maximum	—-(100LL) XX.X GPH (1XX lbs/hr) **

Fuel Grade (Color) . . . . . 100LL (Blue)/100 Octane (Green) **

** 100LL fuel is calibrated at 5.82 lb/gal (.72 Kg/l).
** 100 octane fuel is calibrated at 6.0 lb/gal (.69 Kg/l).

No. of Propellers	1
Propeller Manufacturer	McCauley ***
Propeller Model No	2A34C221/90DHC-16E or -16EP ***

Propeller Diameter:

Min	74.0 In. (187.96cm)
Max. (No cutoff allowed)	74.0 In. (187.96cm)

Propeller Blade Angles @ 30 In. sta.:

Low	14.7 Degrees +/- .2 Degrees ***
High	38.0 Degrees +/- 0.5 Degrees ***

Propeller Operating Limits . . . . . 2600 RPM

*** OPTION: TBD

POWER PLANT INSTRUMENT MARKINGS

INSTRUMENT	- REDLINE - MINIMUM LIMIT	- GREEN ARC - NORMAL OPERATING RANGE	- YELLOW - ARC (CAUTION)	- REDLINE - MAXIMUM LIMIT
Tachometer	700 No Redline	1800-2600		2600 RPM
Manifold Pressure		10.0-39.0 In. Hg.**		39.0 In.Hg.
Turbine Inlet Temperature		1300-1650° F		1650° F*
Cylinder Head Temperature		250-460° F (121-238° C)		460° F (238° C)
Oil Temperature	*** **** No Redline	100-240° F (38-116° C)		240° F (116° C)
Oil Pressure	(IDLE ONLY) 10.0 PSI	30-80 PSI	10-30 PSI	100 PSI

* Operating time above 1650° F. TIT must not exceed 30 seconds. Do not exceed 1700° F. under any condition.

** Normal operating range, no green arc required. (39 In. may be exceeded temporarily up to 41 In. max., not to exceed 2 minutes duration)

*** 75° F (24° C) Min. (Grd. Run)——Needle off White dot.

****100° F (38° C) —— Takeoff

FIGURE 2 - 3 POWER PLANT INSTRUMENT MARKINGS

NOTE

Refer to Teledyne Continental Motors (TCM) Engine Maintenance and Operators Manual Section on Engine Specifications and Operating Limits for recommended cruise power and temperature limitations.

FUEL LIMITATIONS

| NOTE |

Except for takeoff, fuel in the selected tank can be safely used until the quantity indicator reads empty (top of red line) for all other coordinated flight conditions.

| NOTE |

A visual fuel quantity gauge is installed on top of each tank and is to be used as a reference for filling the tanks only.

Standard Tanks (2)	39.3 U.S. Gal. each (149 Liters) (32.7 Imp. Gal.)
Total Fuel:	78.6 U.S. Gal (298 Liters) (65.5 Imp. Gal.)
Usable Fuel:	75.6 U.S. Gal (286 Liters) (63 Imp. Gal.)
Unusable Fuel:	3 U.S. Gal (11.4 Liters) (2.5 Imp. Gal.)
Fuel Grade (and Color):	Minimum grade 100 octane aviation fuel (green) or 100LL (low lead) aviation fuel (blue) with a lead content limited to 2 cc per gallon is approved.

~~~~~~

~ CAUTION ~

To reduce the possibility of ice formation within the aircraft or engine fuel system it is permissable to add ISO-PROPYL alcohol to the fuel supply in quantities NOT TO EXCEED 3% of total fuel volume per tank. DO NOT add other additives to fuel system due to potential deteriorating effects within the fuel system.

WEIGHT LIMITS

Maximum Weight (takeoff and landing)	3130 lb. (1420 Kg.)
Maximum Weight in Baggage Compartment	120 lb. (54.4 Kg.) @ Fus. Sta. 95.5 (24.3 cm)
Maximum Weight in Hatrack	10 lb. (4.54 Kg.) @ Fus. Sta. 119.0 (302 cm)
Maximum Weight in Cargo Area (Rear seats folded down)	340 lbs. (154.2 Kg) @ Fus. Sta. 70.7 (180 cm)

CENTER OF GRAVITY LIMITS (GEAR DOWN)

Most Forward -	Fus. Sta. 41.0 IN. (104 cm) @ 2430 LB. (1102 Kg) 16.13% MAC
Forward Gross -	Fus. Sta. 46.0 IN. (110.5 cm) @ 3130 Lb. (1420 Kg) 20.89% MAC
Aft Gross -	Fus. Sta. 49.3 IN. (125.2 cm) @ 3130 Lb. (1420 Kg) 30.39% MAC
MAC (at Wing Sta. 94.85) (241 cm)	61.00 In. (155 cm)

DATUM (station zero)- 5 inches (12.5 cm) aft of center line of nose gear attach bolts, or 33 in. (84 cm) forward of wing leading edge at wing station 59.25 in. (150 cm).
~~~~~~

MANEUVER LIMITS

This airplane MUST be operated as a Normal Category airplane. Aerobatic maneuvers, including spins, are prohibited.

~~~~~~
~ CAUTION ~
Avoid sideslips with flaps extended and partial power (15-25 In. Hg. MP) applied.

//////////////////////
/// WARNING ///
Takeoff maneuvers when the selected fuel tank contains less than 12 gallons (45.5 liters, 10 IMP. Gal.) of fuel have not been demonstrated.

| NOTE |
Up to 500 foot altitude loss may occur during stalls at maximum weight.

Slow throttle movement required at airspeed above 165 KIAS. Above 165 KIAS, rapid throttle movement may cause momentary propeller RPM overspeed.

FLIGHT LOAD FACTOR LIMITS

Maximum Positive Load Factor	
Flaps Up	+3.8 g.
Flaps Down (33 Degrees)	2.0 g.
Maximum Negative Load Factor	
Flaps Up	-1.5 g.
Flaps Down	.0.0 g.

FLIGHT CREW

Pilot	1
Passengers - Maximum seating configuration	3

OPERATING LIMITATIONS

Maximum operating altitude is 25,000 feet MSL. If this airplane is not equipped with an approved oxygen system and flight operations above 12,500 feet are desired, this airplane must be, (1) equipped with supplemental oxygen in accordance with FAR 23.1441, (2) operated in accordance with FAR 91.32 and (3) equipped with avionics in accordance with FAR 91 or FAR 135.

KINDS OF OPERATION LIMITS

This is a Normal Category airplane approved for VFR/IFR day or night operations when the required equipment is installed and operational as specified in the KINDS OF OPERATION EQUIPMENT LIST and the applicable operating rules.

Optional equipment installations may not be required to be operational. The pilot must determine that the applicable operating rules requirements for each kind of operation are met.

OPERATIONS IN KNOWN ICING CONDITIONS ARE PROHIBITED.

TAKEOFFS WITH COWL FLAP INOPERATIVE ARE PROHIBITED

AUTOPILOT LIMITATIONS - See SECTION IX.
~~~~~~