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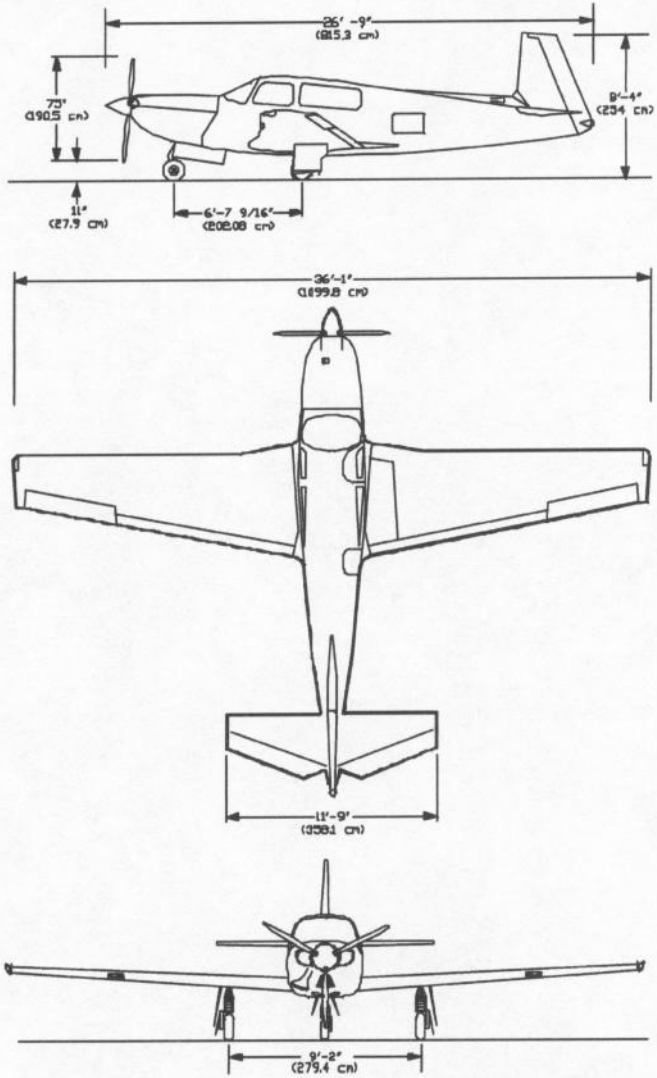

FIG URE 1 - 1 THREE VIEW - M20M

INTRODUCTION

This Operators Manual conforms to GAMA Specification No. 1 and includes both Manufacturers material and FAA APPROVED material required to be furnished to the Pilot by the applicable Federal Aviation Regulations. Section IX contains supplemental data supplied by Mooney Aircraft Corporation.

Section I contains information of general interest to the pilot. It also contains definitions of the terminology used in this Operators Manual.

This Pilot's Operating Handbook is not designed as a substitute for adequate and competent flight instruction, knowledge of current airworthiness directives, applicable federal air regulations or advisory circulars. It is not intended to be a guide for basic flight instruction or a training manual and should not be used for operational purposes unless kept in an up to date status.

All limitations, procedures, safety practices, servicing and maintenance requirements published in this POH/AFM are considered mandatory for the Continued Airworthiness of this airplane in a condition equal to that of its original manufacture.

DESCRIPTIVE DATA

ENGINE

Number of engines	1
Engine Manufacturer	Textron-Lycoming
Model	TIO-540-AF1A*
Recommended TBO	2000 Hours
Type	Reciprocating, air cooled, fuel injected, Turbocharged
Number of cylinders	6, Horizontally opposed
Displacement	541.5 Cu. In. (8875 cc)
Bore	5.125 In. (13.0 cm)
Stroke	4.375 In. (11.11 cm)
Compression ratio	8.0 : 1

* TIO-540-AF1B ENGINE INSTALLED S/N 27-0211 & ON. OPTIONAL FOR S/N 27-0108 THRU 27-0210.

Fuel System

Type	Fuel Injection
Make	Bendix
Fuel-Aviation Gasoline	100 octane - 100LL

Accessories

Magnetos	Pressurized Slick 6260 & 6261 (IM PULSE)
Ignition Harness	Shielded/Braided
Spark Plugs	Textron- Lycoming SI 1042) (18 m/m)
Oil Cooler	Stewart - Warner Full Flow
Alternator (2)	28 Volt DC, 70 AMPS
Starter	24 volt DC
Intercooler	Lycoming
Turbocharger	Airsearch - Model TA0413
Turbocharger Controller System	Density/Differential Pressure Controller

Ratings:

Maximum Take off Sea Level BHP/RPM	270/2575

PROPELLER

Number	1
Manufacturer	McCauley
Model Number	B3D32C417/82NRD-7
Number of Blades	3
Diameter (No cutoff allowed)	75 in. (190.5 cm)
Type	Constant Speed
Governing	Hydraulically controlled by engine oil.
Blade Angles @ 30.0 in. Sta.:	
Low	15.1 degrees +/- 0.2 degrees
High	43 degrees +/- 0.5 degrees

FUEL

Minimum Fuel Grade (Color)	100 LL (Blue) or 100 Octane (Green)
Total Capacity	95 U.S. Gal. (359.6 Liters)
Usable	89.0 U.S. Gal. (336.9 Liters)

OIL

Oil Specification	MIL-L-22851 and as Approved by Textron-Lycoming (Reference Engine Operators Manual)
Above 30° F (-1° C) Ambient Air (S.L.)	SAE 40 or SAE 15W-50
Below 30° F (-1° C) Ambient Air (S.L.)	SAE 30 or 20W-30
Total Oil Capacity	10 Qts. (9.5 liters)
(Minimum for Flight)	6 Qts. (5.7 liters)
Oil Filter	Full Flow

Oil grades, specifications and changing recommendations are contained in SECTION VIII.

LANDING GEAR

TYPE: Electrically operated, fully retractable tricycle gear with rubber shock discs. The main wheels have hydraulically operated disc brakes. The nose wheel is fully steerable 11° left to 13° right of center.

Wheel Base	79 9/16 in. (198.91 cm)
Wheel Track	110 in. (279.4 cm)
Tire Size:	
Nose	5.00 x 5 (6 ply)
Main	6.00 x 6 (6 ply)
Tire Pressure	
Nose	49 PSI
Main	42 PSI
Minimum Turning Radius (No brakes applied)	
Right	40 ft. (12.0 m)
Left	48 ft. (14.4 m)

MAXIMUM CERTIFICATED WEIGHTS

Gross Weight	3368 Lbs. (1528 Kg)
Maximum Landing Weight	3200 Lbs. (1452 Kg)
Baggage Area	120 Lbs. (54.4 Kg)
Rear Storage Area	10 Lbs. (4.5 Kg)
Cargo (Rear Seats Folded Down)	340 Lbs. (154.2 Kg)

STANDARD AIRPLANE WEIGHTS

Basic Empty Weight	See Page 1-8
Useful Load	Varies with installed equipment. See SECTION VI for specific airplane weight (pg. 6-6).

CABIN AND ENTRY DIMENSIONS

Cabin Width (Maximum)	43.5 In. (110.5 cm)
Cabin Length (Maximum)	126 In. (315 cm)
Cabin Height (Maximum)	44.5 In. (113 cm)
Entry Width (Minimum)	29.0 In. (73.4 cm)
Entry Height (Minimum)	35.0 In. (88.9 cm)

BAGGAGE SPACE AND ENTRY DIMENSIONS

Compartment Width	24 In. (60.9 cm)
Compartment Length	43 In. (109.2 cm)
Compartment Height	35 In. (88.9 cm)
Compartment Volume	20.9 Cu. Ft. (.592 cubic meters)
Cargo Area (with rear seat folded down)	38.6 Cu. Ft. (1.09 cubic meters)
Entry Height (Minimum)	20.5 In. (52.1 cm)
Entry Width	17.0 In. (43.2 cm)
Ground to Bottom of Sill	46.0 In. (116.8 cm)

SPECIFIC LOADINGS

Wing Loading - @ Maximum Gross Weight	19.26 Lbs./Sq. Ft. (94 Kg/sq. m)
Power Loading - @ Maximum Gross Weight	12.47 Lbs./HP (5.66 Kg/HP)

IDENTIFICATION PLATE

All correspondence regarding your airplane should include the Serial Number as depicted on the identification plate. The identification plate is located on the left hand side, aft end of the tail cone, below the horizontal stabilizer leading edge. The aircraft Serial Number and type certificate are shown.

SYMBOLS, ABBREVIATIONS & TERMINOLOGY

GENERAL AIRSPEED TERMINOLOGY & SYMBOLS

GS	GROUND SPEED - Speed of an airplane relative to the ground.
KCAS	KNOTS CALIBRATED AIR SPEED - The indicated speed of an aircraft, corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level.
KIAS	KNOTS INDICATED AIRSPEED - The speed of an aircraft as shown on its airspeed indicator. IAS values published in this handbook assume zero instrument error.
KTAS	KNOTS TRUE AIR SPEED - The air speed of an airplane relative to undisturbed air which is the KCAS corrected for altitude and temperature.
V_a	MANEUVERING SPEED - The maximum speed at which application of full available aerodynamic control will not overstress the airplane.
V_{fe}	MAXIMUM FLAP EXTENDED SPEED - The highest speed permissible with wing flaps in a prescribed extended position.
V_{le}	MAXIMUM LANDING GEAR EXTENDED SPEED - The maximum speed at which an aircraft can be safely flown with the landing gear extended.
V_{lo}	MAXIMUM LANDING GEAR OPERATING SPEED - The maximum speed at which the landing gear can be safely extended or retracted.
V_{ne}	NEVER EXCEED SPEED - The speed limit that may not be exceeded at any time.
V_{no}	MAXIMUM STRUCTURAL CRUISING SPEED - The speed that should not be exceeded except in smooth air and then only with caution.
V_s	STALLING SPEED - The minimum steady flight speed at which the airplane is controllable.
V_{so}	STALLING SPEED - The minimum steady flight speed at which the airplane is controllable in the landing configuration.
V_x	BEST ANGLE-OF-CLIMB SPEED - The airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance.
V_y	BEST RATE-OF-CLIMB SPEED - The airspeed which delivers the greatest gain in altitude in the shortest possible time with gear and flaps up.

ENGINE POWER TERMINOLOGY

BHP	BRAKE HORSE POWER - Power de vel oped by the en gine.
MCP	MAXI MUM CON TINU OUS POWER - The maxi mum power for take off, nor mal, ab nor mal or emer gency op era tions.
CHT	CYL IN DER HEAD TEM PERA TURE - Op er at ing tem pera ture of engine cyl in der(s) be ing moni tored by a sen sor unit. Ex pressed in °C.
MP	MANI FOLD PRES SURE - Pres sure meas ured in the en gi ne's in duc tion sys tem and is ex pressed in inched of mer cury (Hg).
RPM	REVOLUTIONS PER MINUTE - En gine speed.
TIT	TUR BINE IN LET TEM PERA TURE - The ex haust gas temperature meas ured at the tur bo charger tur bine in let. Ex pressed in °F.
Turbocharger	A de vice used to sup ply in creased amounts of air to an en gine in duc tion sys tem. In operation, the tru bine is driven by engine ex haust gas mix ture. The tur bine di rectly drives a com pres sor which pumps air into the en gine in take.

AIRPLANE PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

Demon-strated Crosswind Velocity	The ve loc ity of the cross wind com po nent for which ade quate control of the airplane dur ing take off and land ing test was ac tu ally dem on strated dur ing cer ti fi ca tion. The value shown is not con sid ered to be lim it ing.
g	Acceleration due to grav ity.
Service Ceiling	The maxi mum al ti tude at which air craft at gross weight has the capability of climbing at the rate of 100 ft/min.

ENGINE CONTROLS & INSTRUMENTS TERMINOLOGY

Propeller Control	The con trol used to se lect en gine speed.
Throttle Control	The con trol used to se lect en gine power by con trol ling MP.
Mixture Control	Pro vides a me chani cal link age to the fuel in jec tor mix ture control Control to con trol the size of the fuel feed ap er ture, and there fore the air/fuel mix ture. It is the pri mary method to shut the engine down.
CHT Gauge	Cyl in der head temperature indicator used to de ter mine that en gine operating tempera ture is within manu fac tur ers speci fi ca tions.
Tachometer	An in stru ment that in di cates ro ta tional speed of the Engine. The speed is shown as revo lu tions per minute (RPM).
Propeller Governor	The de vice that regu lates RPM of the en gine/pro pel ler by increasing or de creas ing the pro pel ler pitch, through a pitch change mecha nism in the pro pel ler hub.

METEOROLOGICAL TERMINOLOGY

AGL	Above ground level.
Density Altitude	Altitude as determined by pressure altitude and existing ambient temperature. In standard atmosphere (ISA) density and pressure altitude are equal. For a given pressure altitude, the higher the temperature, the higher the density altitude.
Indicated Altitude	The altitude actually read from an altimeter when, and only when barometric subscale (Kollsman window) has been set to Station Pressure.
ISA	INTERNATIONAL STANDARD ATMOSPHERE assumes that (1) The air is a dry perfect gas; (2) The temperature at sea level is 15 degrees Celsius (59° F); (3) The pressure at sea level is 29.92 inches Hg (1013.2 mb); (4) The temperature gradient from sea level to the altitude at which the temperature is -56.5° C (-69.7° F) is -0.00198° C (-0.003564° F) per foot.
OAT	OUT SIDE AIR TEMPERATURE - The free air static temperature, obtained either from in flight temperature indications or ground meteorological sources. It is expressed in ° C.
Pressure Altitude	The indicated altitude when Kollsman window is set to 29.92 In. Hg. or 1013.2 MB. In this handbook, altimeter instrument errors are assumed to be zero.
Station Pressure	Actual atmospheric pressure at field elevation.

WEIGHT AND BALANCE TERMINOLOGY

Arm	The horizontal distance from the reference datum to the center of gravity (C.G.) of an item.
Basic Empty Weight	The actual weight of the airplane and includes all operating equipment (including optional equipment) that has a fixed location and is actually installed in the aircraft. It includes the weight of unusable fuel and full oil.
Center of Gravity (C.G.)	The point at which an airplane would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane.
C.G. Arm	The arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.
C.G. in percent MAC	Center of Gravity expressed in per cent of mean aerodynamic chord.
C.G. Limits	The extreme center of gravity locations within which the airplane must be operated at a given weight.
MAC	Mean Aerodynamic Chord.
Maximum Weight	The maximum authorized weight of the aircraft and its contents as listed in the aircraft specifications.

WEIGHT AND BALANCE TERMINOLOGY (con't.)

Maximum Landing Weight	The maximum authorized weight of the aircraft and its contents when a normal landing is to be made.
Moment	The product of the weight of an item multiplied by its arm. (Moment divided by a constant is used to simplify balance calculations by reducing the number of digits.)
Reference Datum	An imaginary vertical plane from which all horizontal distances are measured for balance purposes.
Station	A location along the airplane fuselage usually given in terms of distance from the reference datum.
Tare	The weight of chocks, blocks, stands, etc. used when weighing an airplane, and is included in the scale readings. Tare is deducted from the scale reading to obtain the actual (net) airplane weight.
Unusable Fuel	Fuel remaining after a runout test has been completed in accordance with governmental regulations.
Usable Fuel	Fuel available for aircraft engine combustion.
Useful Load	The basic empty weight subtracted from the maximum weight of the aircraft. This load consists of the pilot, crew if applicable, fuel, passengers, and baggage.

MEASUREMENT CONVERSION TABLES

LENGTH

U. S. Customary Unit	Metric Equivalents
1 inch	2.54 centimeters
1 foot	0.3048 meter
1 yard	0.9144 meter
1 mile (statute, land)	1,609 meters
1 mile (nautical, international)	1,852 meters

AREA

U. S. Customary Unit	Metric Equivalents
1 square inch	6.4516 sq. centimeters
1 square foot	929.030 sq. centimeters
1 square yard	0.836 sq. meter

VOLUME OR CAPACITY

U. S. Customary Unit	Metric Equivalents
1 cubic inch	16.387 cubic centimeters
1 cubic foot	0.028 cubic meter
1 cubic yard	0.765 cubic meter

VOLUME OR CAPACITY (con't.)

U.S. Customary Liquid Measure	Metric Equivalents
1 fluid ounce	29.573 milliliters
1 pint	0.473 liter
1 quart	0.946 liter
1 gallon	3.785 liters

U.S. Customary Dry Measure	Metric Equivalents
1 pint	0.551 liter
1 quart	1.101 liters

British Imperial Liquid and Dry Measure	U. S. Equivalents	Metric Equivalents
1 fluid ounce	0.961 U.S. fluid ounce, 1.734 cubic inches	28.412 milliliters
1 pint	1.032 U.S. dry pints, 1.201 U.S. liquid pts., 34.678 cubic inches	568.26 milliliters
1 quart	1.032 U.S. dry quarts 1.201 U.S. liquid qts., 69.354 cubic inches	1.136 liters
1 gallon	1.201 U.S. 277.420 cubic inches	4.546 liters

WEIGHT

U. S. Customary Unit (Avoirdupois)	Metric Equivalents
1 grain	64.79891 milligrams
1 dram	1.772 grams
1 ounce	28.350 grams
1 pound	453.59237 grams

PRESSURE

U.S. Customary Unit.	Metric Equivalents
1 PSIG	6.895 KPA
1 Inch Hg	3.388 KPA
1 Inch Hg	25.40 mm Hg