AIRPLANE FLIGHT MANUAL
MAC 145B

MAC-145B

AIRPLANE FLIGHT MANUAL SUPPLEMENT
For
Acrobatic Operations

Report Number: F-145B-3A

Manufacturer's Serial Number 260006

Registration Number N692AS

Micco Aircraft Company
3100 Airman's Drive
Fort Pierce, FL 34946

FAA APPROVED IN THE ACROBATIC CATEGORY BASED ON FAR 23. THIS DOCUMENT MUST BE CARRIED IN THE AIRPLANE AT ALL TIMES.

THIS AIRPLANE FLIGHT MANUAL INCLUDES THE MATERIAL REQUIRED TO BE FURNISHED TO THE PILOT BY THE FEDERAL AVIATION REGULATIONS AND ADDITIONAL INFORMATION PROVIDED BY THE MANUFACTURER AND CONSTITUTES THE FAA APPROVED AIRPLANE FLIGHT MANUAL.

AIRPLANE FLIGHT MANUAL SUPLEMENT ISSUE DATE: MAR 0 4 2002

FAA APPROVED BY: Eugene L. Bollin

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Atlanta Aircraft Certification Office
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REV: Date:

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SECTION 1 GENERAL/SYSTEM DESCRIPTIONS

A. POWERPLANT:

1. General: The MICCO MAC-145B is powered by a single Textron Lycoming reciprocating engine approved for acrobatic operations. There are no changes to the engine in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft.

2. Propeller: The MAC-145B is fitted with a three bladed Hartzell 78" constant speed, aluminum propeller for acrobatic operations. There are no changes to the propeller in the propeller governing system in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft. However, the propeller installed on the MAC-145B Acrobatic aircraft is FAA approved for acrobatic operations. In the acrobatic propeller certification flight tests, it was determined there are high propeller blade stress loads during power-on spins. Therefore, there is a limitation of one power-on acrobatic spin per hour of propeller life.

WARNING

Do not exceed one power-on spin acrobatic spin per hour of propeller life.

3. Engine Oil System: There are no changes to the oil system in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft. Negative "g" maneuvers are limited to 5 seconds or less.

4. Powerplant/Propeller Combination: There are no changes to the powerplant/propeller combination in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft.

B. FUEL SYSTEM

1. General: The fuel system in the approved MAC-145B Acrobatic Category aircraft is the major modification from the MAC-145B Utility Category aircraft. The acrobatic category aircraft has four fuel tanks installed, two main tanks, and two inboard acrobatic tanks. The main tanks are identical in both the Acrobatic Category aircraft and the Utility Category aircraft. The Acrobatic Category aircraft has two additional inboard acrobatic tanks that are used primarily for acrobatic operations. Acrobatic fuel tank quantities are displayed to the pilot by an additional fuel gage on the pilot's instrument that has a selector switch to read the quantity in the left tank, the right tank, or in both tanks.

WARNING

Acrobatic operations are prohibited unless the outboard fuel tanks are empty.

2. Fuel Tank Selection: In the Acrobatic Category aircraft, fuel from each tank to the engine is selected through the five positions on the fuel selector valve:

- Left main
- Left acrobatic
- Right acrobatic
- Right main
- OFF

To select the OFF position, it is necessary to lift a spring lock lever that is an integral part of the fuel selector valve. When selecting fuel tanks in flight, it is recommended the auxiliary fuel pump be selected ON.

3. Fuel Tank Capacities:

Acrobatic Category Only

TANK	CAPACITY (US Gals.)	USABLE FUEL
Left Acrobatic tank	16	14
Right Acrobatic tank	16	14
TOTALS	32	28

Acrobatic fuel tank quantities are displayed to the pilot by an additional fuel gage on the pilot's instrument that has a selector switch to read the quantity in the left tank, the right tank, or in both tanks.

C. FLIGHT CONTROL SYSTEM:

The only change to the flight control system is an increase of elevator down travel to 27° in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft. Also, nose cowl strakes were added to both sides of the cowl on the Acrobatic Category aircraft to improve spin recovery characteristics.

TABLE I

FLIGHT CONTROL SURFACES TRAVELS, TOLERANCE ± 2°

MODEL	AILERON		ELEVATOR		EL TRIM		RUDDER		FLAPS
	UP	DN	UP	DN	UP	DN	LEFT	RIGHT	
MAC-145B Acro	22°	12°	28°	27°	4°	24°	22°	22°	30°

D. OTHER AIRCRAFT SYSTEMS:

There are no changes to any other aircraft systems in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft.

SECTION 2 OPERATING LIMITATIONS

AIRSPEED LIMITATI ONS (Acrobatic Category)

There are no changes to the airspeed limitations in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft.

AIRSPEED INDICATOR MARKINGS (Acrobatic Category)

There are no changes to the airspeed indicator markings in the approved MAC-145B acrobatic category aircraft from the MAC-145B utility category aircraft.

POWER PLANT LIMITATIONS (Acrobatic Category)

There are no changes to the power plant limitations in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft.

PROPELLER LIMITATIONS (Acrobatic Category)

Acrobatic Category **POWER-ON SPINS** are limited to one acrobatic spin per hour of propeller life. See page 23 of this AFM Supplement for Power-On Spin tracking via Micco Form F-145B-3A-1.

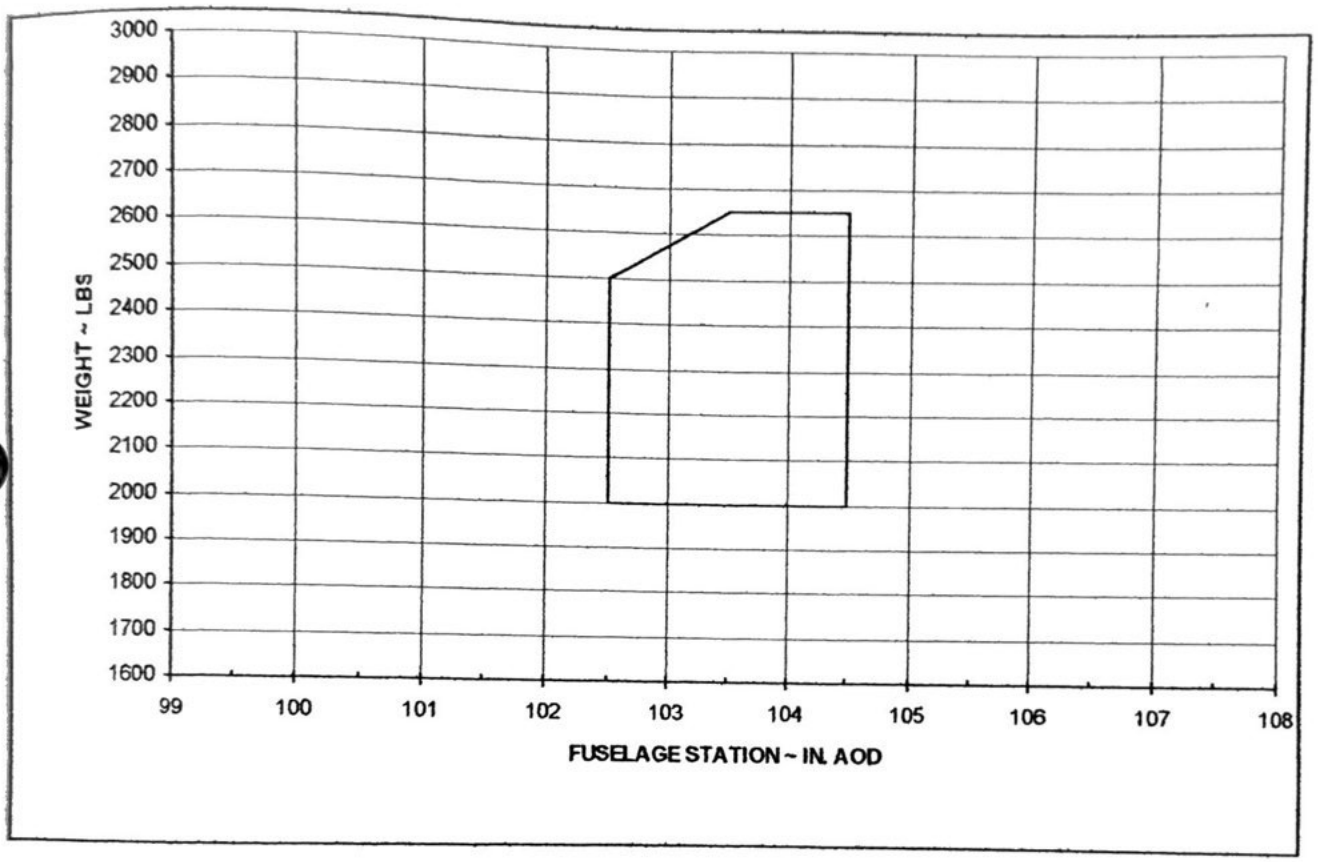
POWER PLANT INSTRUMENT MARKINGS (ACROBATIC CATEGORY)

There are no changes to the powerplant instrument markings in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft.

WEIGHTS (Acrobatic Category)

Maximum Ramp Weight.....2650 LBS
Maximum Takeoff Weight.....2650 LBS
Maximum Landing Weight.....2650 LBS
Maximum Zero Fuel Weight.....2518 LBS
Minimum Flight Weight.....2000 LBS
Maximum Baggage Weight.....-0- LBS

WEIGHT AND CENTER OF GRAVITY ENVELOPE (Acrobatic Category)



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FLIGHT MANEUVER LIMITS (Acrobatic Category)

WARNING

INVERTED FLIGHT IS PROHIBITED.
INTENTIONAL SPINS WITH THE GEAR AND/OR FLAPS DOWN ARE PROHIBITED.
ACROBATIC FLIGHT PERMITTED ONLY WITH BOTH OUTBOARD FUEL TANKS EMPTY.

WARNING

Flight tests have demonstrated that it may not be able to recover from spins unless the outboard main fuel tanks are empty. Unless outboard main tanks are empty, spins are strictly prohibited.

ACROBATIC MANEUVERS ARE LIMITED TO THE FOLLOWING:

Maneuver	Entry Speed	Exit Speed
Aileron Rolls	140 KIAS	130 KIAS
Barrel Rolls	150 KIAS	140 KIAS
Chandelles	150 KIAS	65 KIAS
Wing Overs	140 KIAS	65 KIAS
Hammer Heads	140 KIAS	65 KIAS
Lazy Eights	120 KIAS	120 KIAS
Split S	90 KIAS	140 KIAS
Loops	150 KIAS	130 KIAS
Immelmanns	160 KIAS	65 KIAS
Cuban Eights	140 KIAS	140 KIAS
Clover Leafs	140 KIAS	140 KIAS
Spins	Slow Decel.	Aircraft Limits
Steep Turns	120 KIAS	120 KIAS

INVERTED FLIGHT PROHIBITED

Maximum demonstrated crosswind component during takeoff and landing is 20 knots (same as Utility Category).

FLIGHT LOAD FACTORS (Acrobatic Category)

Maximum Positive Load Factor Flaps Up.....+6.0g
Maximum Negative Load Factor.....-3.0 g

STALLS

There are no changes to the stall characteristics in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft. The addition of nose cowl strakes on the Acrobatic Category aircraft does not change the stall characteristics.

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FUEL QUANTITY

Maximum Fuel Quantity:
16 US Gallons per tank (Left and Right inboard acrobatic tanks)

Minimum Fuel Quantity
2 US Gallons per tank (Left and Right inboard acrobatic tanks)

FUEL LIMITATIONS

Minimum Aviation Fuel Grade.....100 / 100LL
Acrobatic Category.....32 US Gallons

Unusable Fuel
Each Main Tank.....2 US Gallons
Each Inboard Acrobatic Tank.....2 US Gallons

Useable Fuel
Acrobatic Category.....28 US Gallons

Maximum Fuel Imbalance
Inboard Acrobatic Tanks..... 5 US Gallons

KINDS OF OPERATION

There are no changes to the kinds of operation in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft

KINDS OF OPERATING EQUIPMENT LIST (Acrobatic Category)

This airplane may be operated in day or night VFR or IFR, when the appropriate equipment is installed and operable. There are no changes to the kinds of operating equipment list in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft

MAXIMUM TAKEOFF PRESSURE ALTITUDE LIMIT (Acrobatic Category)

No change

MAXIMUM OPERATING ALTITUDE LIMIT (Acrobatic Category)

No change

MINIMUM FLIGHT CREW (Acrobatic Category)

No change (One pilot.)

MAXIMUM PASSENGER SEATING LIMITS (Acrobatic Category)

No change

ALTERNATE STATIC SOURCE (Acrobatic Category)

No change

PLACARDS

In full view of the pilot:

OPERATING LIMITATIONS (Utility or Acrobatic Category)

THE MARKINGS AND PLACARDS INSTALLED IN THIS AIRPLANE CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS AIRPLANE IN THE UTILITY CATEGORY, OR WHEN EQUIPPED, FOR THE ACROBATIC CATEGORY. OTHER OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS AIRPLANE ARE CONTAINED IN THE AIRPLANE FLIGHT MANUAL.

UTILITY ACROBATIC MANEUVERS ARE LIMITED TO THE FOLLOWING:

Maneuver	Entry Speed
Steep turns	120 KIAS
Lazy eights	120 KIAS
Chandelles	150 KIAS

SPINS PROHIBITED
INVERTED FLIGHT IS PROHIBITED

CAUTION

Excessive fuel in the Acrobatic tanks may cause the Utility Category maximum gross weight (2850 pounds) to be exceeded resulting in unsafe flight conditions.

OPERATING LIMITATIONS (Acrobatic Category Only)

INVERTED FLIGHT IS PROHIBITED.
INTENTIONAL SPINS WITH THE GEAR AND/OR FLAPS DOWN ARE PROHIBITED.
ACROBATIC FLIGHT PERMITTED ONLY WITH BOTH MAIN FUEL TANKS EMPTY.

WARNING

Flight tests have demonstrated that it may not be able to recover from spins unless the main fuel tanks are empty. Unless main tanks are empty, spins are strictly prohibited.

ACROBATIC MANEUVERS ARE LIMITED TO THE FOLLOWING:

MANEUVERS	ENTRY SPEED	EXIT SPEED
STEEP TURNS	120 KIAS	120 KIAS
LAZY EIGHTS	120 KIAS	120 KIAS
WING OVERS	140 KIAS	65 KIAS
CHANDELLES	150 KIAS	65 KIAS
AILERON ROLLS	140 KIAS	130 KIAS
BARREL ROLLS	150 KIAS	140 KIAS
HAMMER HEADS	140 KIAS	65 KIAS
SPLIT S	90 KIAS	140 KIAS
LOOPS	150 KIAS	130 KIAS
IMMELMANNS	160 KIAS	65 KIAS
CUBAN EIGHTS	140 KIAS	140 KIAS
CLOVER LEAFS	140 KIAS	140 KIAS
SPINS	SLOW DECEL.	AIRCRAFT LIMITS

INVERTED FLIGHT PROHIBITED

ON CANOPY HOLDBACK LATCH (ACROBATIC or Utility CATEGORY):

ATTENTION

PULL DOWN TO RELEASE CANOPY
FROM THE AFT POSITION

ATTENTION

THIS LATCH HOLDS CANOPY BACK ONLY

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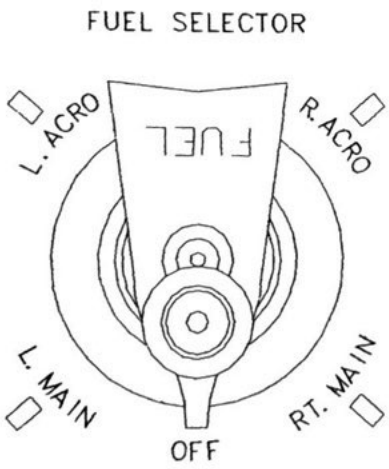
ON CENTER CONSOLE NEAR FUEL TANK SELECTOR (Acrobatic Category):

Main tanks:
34 US GAL USABLE
FUEL EACH TANK

Inboard Acrobatic tanks:
14 US GAL USABLE
FUEL EACH TANK

ON CENTER CONSOLE NEAR FUEL TANK SELECTOR (Acrobatic Category):

FUEL TANK SELECTOR



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SECTION 3 EMERGENCY PROCEDURES

Emergency procedures in the approved MAC-145B Acrobatic Category aircraft are as follows:

EMERGENCY EGRESS DURING ACROBATIC OPERATIONS:

Canopy.....UNLATCH and OPEN
Canopy.....LATCH FULL BACK
Seat Belts and shoulder Harness.....RELEASE
Aircraft.....EXIT AT EMERGECY SAFE ALTITUDE

When Clear of the Aircraft:
Parachute Ripcord.....PULL

WARNING

Recommended emergency exit altitude is 2500 ft. Above Ground Level (AGL) or higher. Actual emergency exit altitude for each flight should be determined by the Pilot in Command (PIC). The PIC should brief the other pilot or passenger on emergency exit procedures and emergency exit altitude.

There are no other changes in Emergency Procedures for MAC-145B Acrobatic Operations.

SECTION 4 NORMAL PROCEDURES

SPIN RECOVERY

Rudder .....FULL OPPOSITE TO DIRECTION OF ROTATION
Control Stick .....AGRESSIVELY FULL FORWARD (Immediately)
Ailerons .....NEUTRAL
Throttle .....CLOSED

WHEN ROTATION STOPS:

Rudder .....NEUTRAL
Control Stick .....AS REQUIRED TO SMOOTHLY REGAIN LEVEL FLIGHT ATTITUDE
Throttle.....ADVANCE AS REQUIRED.

NOTE: NORMAL SPIN RECOVERY PROCEDURE IS THE SAME AS EMERGENCY INADVERTANT SPIN RECOVERY PROCEDURE.

CAUTION

If an improper or poorly executed spin recovery technique is attempted that results in the spin exceeding two turns after recovery execution, adding full power momentarily may assist in spin recovery. KNOW

GENERAL: There are no other changes to the normal procedures in the approved MAC-145B Acrobatic Category aircraft from the MAC-145B Utility Category aircraft.

SECTION 5 PERFORMANCE

Performance of the approved MAC-145B Acrobatic Category aircraft is equal to or better than the performance of the MAC-145B Utility Category aircraft due to the maximum gross weight limitation of 2650 pounds for the Acrobatic Category aircraft.

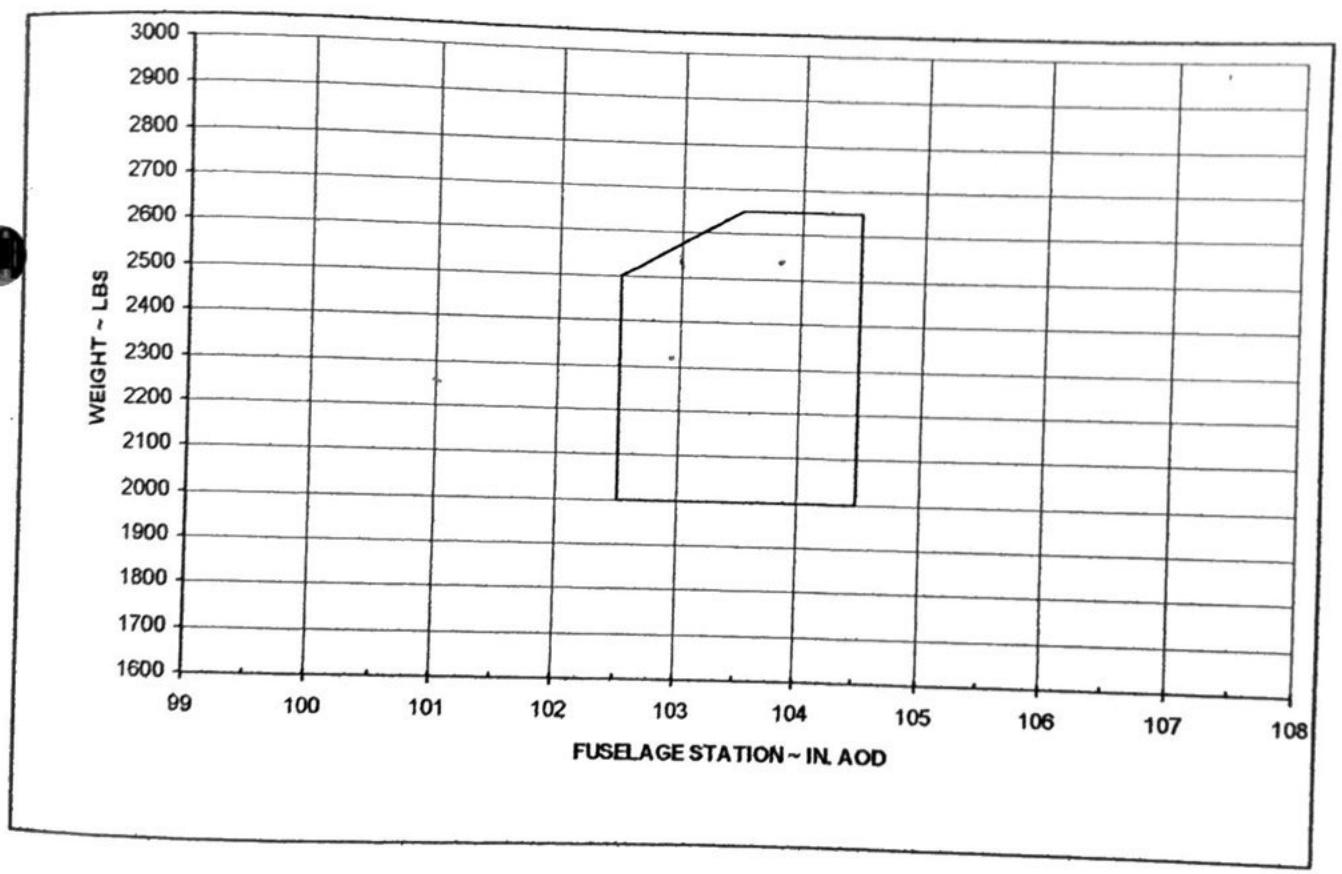
SECTION 6

WEIGHT and BALANCE

WEIGHTS, CENTER OF GRAVITY, AND MOMENTS (Acrobatic Category)

Airplane Empty Weight and CG determined by actual aircraft weights.

Weights, Arms, and Moments are provided to calculate airplane total weight and center of gravity prior to each flight.



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WEIGHT AND BALANCE LOADING ENVELOPE

SAMPLE WEIGHT AND BALANCE FORM (Acrobatic Category)

ITEM	WEIGHT ~ lbs.	Arm~ in	MOMENT ~ lb.-in
Airplane Empty Weight and CG	2120.0	100.40	**212848.00**
Pilot w/parachute* in seat position: MID	190.0	115.88	22017.20
Passenger w/ parachute in seat position: FWD	170.0	113.97	19374.90
Baggage	00.0	150.00	0.00
Total airplane weight and CG without fuel available for flight	2480.0	102.52	**254240.1**
Fuel – (28 gal @ 6.0 lb/gal- See Charts)	168.0	119.93	20148.24
Maximum airplane weight and CG with fuel available for flight	2648.0	103.62	**274388.34**

*Note: Emergency parachutes calculated a 20 lbs. each.

ACTUAL WEIGHT AND BALANCE FORM (Acrobatic Category)

Notes:

1. **Weight and CG must be calculated before each flight.**
2. **No baggage is permitted on board for Acrobatic Operations.**

ITEM	WEIGHT ~ lbs.	Arm~ in	MOMENT ~ lb.-in
Airplane Empty Weight and CG (Ref. Current Weight &			
Pilot (Check seat position) + parachute			
Passenger (Check seat position) + parachute			
Total airplane weight and CG without fuel available for flight			
Fuel – (6#/US Gals. x No. Gals.- See Charts)		119.93	
Maximum airplane weight and CG with fuel available for flight			

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Pilot and Passenger Seat Position and Arm

POSITION	ARM
Forward	113.97
Mid	115.88
Aft	117.78

ACROBATIC FUEL TANKS

Acrobatic Category Only

TANK	CAPACITY (US Gal.)	USABLE	ARM
Left	16	14	119.93
Right	16	14	119.93
Totals	32	28	119.93

Simplified Acrobatic Fuel Tank Moments (Acrobatic Category Only)

Notes:
1. These figures apply to each acrobatic tank.
2. Minimum Fuel for Acrobatic Category Operations is 2 gallons per tank.
3. In case of odd gallon fuel moments, go to next higher value per tank.

Gallons	Pounds	Arm	Moment
2	12	119.93	1439
4	24	119.93	2878
6	36	119.93	4317
8	**48**	119.93	5757
10	**60**	119.93	7196
12	**72**	119.93	8635
14	84	119.93	10074

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SECTION 7 SAFETY IN ACROBATIC MANEUVERS

1. General: Approved acrobatic maneuvers are limited to those listed in Section 2, Operating Limitations. No other acrobatic maneuvers are approved. Inverted flight is prohibited. Negative "g" maneuvers are limited to 5 seconds or less.

Both during preflight for and post flight after acrobatic operations, a detailed exterior inspection of the aircraft should be accomplished for structural integrity. Detection of deformed ("wrinkled or bent") aircraft panels or parts should be cause for a further inspection by a competent aircraft maintenance technician. Acrobatic flight should not be attempted until both the maintenance technician and the pilot has determined the aircraft airworthy for such flight operations.

During acrobatic maneuvers, the aircraft should be operated within the airspeed and "g" limits listed in Section 2, Operating Limitations, using smooth flight control inputs. The only exception to smooth control inputs as good operating practice is during spins. During spin recovery, both the rudder and the elevator should be moved aggressively. The rudder pedals should be moved opposite and held firmly against the spin direction. The elevator control stick should be moved aggressively full forward until the nose pitches well down (close to 90° from the horizon). **Flight tests have demonstrated that the manufacturer's recommended spin recovery procedures must be rigorously followed for immediate spin recovery.**

2. Altitudes for Acrobatic Operations: Acrobatic maneuvers are recommended to be started at 3500 ft. or higher above ground level (AGL). Intentional spins are recommended to be started at 5000 ft. or higher AGL for a one turn spin. For each spin turn greater than one turn, it is recommended to add 500 ft. to the base altitude before starting the spin. (For example, it is recommended a six turn spin should be started at 8500 ft. or higher AGL). For all acrobatic operations, the provisions of FAR 91.305 must be observed.

WARNING

With CRUISE POWER OR HIGHER – SET, and the aircraft's nose well below the horizon, considerable altitude can be lost resulting in a rapid build-up of very high airspeed. Abrupt flight control inputs at very high airspeed can result in very high "g" forces which could overstress the aircraft and further result in structure damage or failure. In any acrobatic attitude, the pilot can normally return the aircraft to usual flight attitudes by retarding the throttle to IDLE and using smooth flight control inputs to return the aircraft's nose to the horizon.

3. **Aircraft Emergency Escape Provisions:** The canopy is equipped with an emergency "Hold Back" combination handle and latch for emergency escape either in-flight or on the ground. For all acrobatic maneuvers, the use of parachutes in accordance with the provisions of FAR 91.307 must be followed.

4. **Preparation for Acrobatic Flight Operations:** Acrobatics require both thorough pre-flight and in-flight planing. No baggage is permitted during acrobatic flight. All loose objects must be secured. No fuel is permitted in the main tanks during acrobatic flight. Fuel quantity must be closely monitored during acrobatics to keep fuel within a maximum of five gallons difference in the acrobatic fuel tanks.

5. **Pre-Spin/Acrobatic Checklist:** In preparation for spins or acrobatics, the pilot should complete the following items:

   - ☐ Pilot and passenger seats securely locked
   - ☐ Pilot and passenger seat belts and harnesses securely fastened
   - ☐ All loose objects securely stowed
   - ☐ Fuel EMPTY in both left and right main tanks
   - ☐ Fuel Selector on left or right acrobatic tanks
   - ☐ Fuel in acrobatic tanks balanced within five gallons
   - ☐ Auxiliary Fuel Pump - ON
   - ☐ Spin maneuver area selected for considerable loss of altitude.

6. **Acrobatic Spin Description:** During the first turn of a multiple turn spin, the aircraft is not stable in its spin mode. Therefore, spin recovery is almost immediate with anti-spin flight control inputs. During the second and third turns of a spin, the aircraft spin rate accelerates to a maximum. Therefore, aggressive, full anti-spin flight control inputs are necessary to recover from the spin in minimum turns. After three turns, the spin rate stabilizes with the nose well below the horizon. After three or more spin turns, aggressive, full anti-spin flight control inputs are necessary to recover in minimum spin turns.

7. **Acrobatic Flight Instruction:** It is recommended that the pilot receive competent flight instruction in acrobatic maneuvers before attempting acrobatic operations. This is good operating practice to ensure safety in acrobatic operations. Flight tests have demonstrated that the MAC-145B is safe for all approved acrobatic maneuvers if the aircraft is operated properly in accordance with the procedures of this AFM Supplement.

MICCO
REPORT No. F-145B-3-6
MICCO AIRCRAFT MAC 145B w/ ACROBATIC OPTION
MSN: 260006 EQUIPMENT LIST
Revised: April 9, 2002

I. Engine and Engine Accessories

Item	Installed	Weight (lbs)	Arm (in)
1. Engine, Lycoming IO-540-T4B5 Cert. Basis TC 1E4	X	418	32.8
2. Engine Driven Fuel Pump, Lycoming LW15473	X	(Inc. in Engine Weight)	
3. (2) Slick Magnetos, PN6351(L) PN6350(R)	X	(Inc. in Engine Weight)	
4. Fuel Injector, Precision RSA 5AD1 (LW-14184)	X	(Inc. in Engine Weight)	
5. Starter, Lycoming, 31B22105 (Sky-Tec 149-24LS) PMA	X	8.0	21.0
6. Alternator, Electro-Systems, ALU-8421LS (Lycoming PN 32C19553)	X	11.8	22.0
7. Oil Cooler, Lori 8534108	X	4.9	47.5
8. Engine Air Filter, Bracket BA 3210	X	0.8	51.0
9. Vacuum Pump, SIGMA-TEK, 1U128-006	X	2.6	47.0
10. Vacuum Air Filter, Airborne 1 J7-1	X	0.5	74.0
11. Vacuum Regulator, Airborne 2H3-12	X	0.4	60.0
12. Electric Fuel Pump, Weldon B8120-H	X	1.7	56.5
13. Gascolator, Commercial Aircraft Products C100203	X	1.5	56.5
14. Fuel Selector Valve (4 tank) Andair 270062-1	X	0.6	115.0

Propeller and Propeller Accessories

	Installed	Weight (lbs)	Arm (in)
Propeller, Hartzell 78", 3 Blade HC-C3YR-1RF/F7693F/SM18	X	78.5	10.87
Hydraulic Governor, McCauley DC290D1 PN D20983-19	X	2.8	21.0
Spinner & Attachment Plate, Hartzell C-3535-1P	X	(Included in prop wt.)	

Landing Gear and Brakes

	Installed	Weight (lbs)	Arm (in)
1. (2)Wheel Assembly Cleveland #40-60 Cert. Basis TSO 26A	X	6.6 ea	93.26
2. (2)Brake Assembly Cleveland #30-60A Cert. Basis TSO 26B	X	2.7 ea	91.52
3. (2) Tires W/Reg. Tubes, 6:00 x 6, 6 Ply Rating Cert. Basis TSO C62	X	8.2 ea	93.26
4. Tail Wheel Assembly, Maule TW 101 SFSA-1-2	X	5.5	250.6
5. (4) Toe Brakes Cylinders,			
(2) Cleveland 10-54A (Pilot's Side)	X	.5 ea	79.0
(2) Cleveland 10-45 (Copilot's Side)	X	.6 ea	79.0
6. Landing Gear Hydraulic Pump, Oildyne 108BIC19-CLB-1VT	X	7.6	94.5
7. (2) Main Gear Hydraulic Cylinders, Micco P/N 440035-3(L), -4(R)	X	2.3 ea	87.0
8. Tail Wheel Hydraulic Cylinder, Micco P/N 440079-1	X	1.9	252.0

IV. Instruments

Item	Installed	Weight (lbs)	Arm (in)
1. Airspeed Indicator, SIGMA-TEK (PN 450014-12)	X	0.7	91.3
2. Altimeter, United Instrument 5934-3 A.157 Cert. Basis TSO-C10b	X	0.9	90.8
3. Rate of Climb, United Instruments 7000	X	0.8	91.0
4. Compass, Airpath Instrument Co. C 2400 L4P-24B	X	0.7	82.3
5. Attitude Indicator, SIGMA-TEK IU367-251-1	X	2.3	90.3
6. Directional Gyro, SIGMA-TEK 1U262-011-15	X	3.0	90.3
7. Turn/Slip Indicator, United Instrument 9013 N.5	X	1.6	91.3
8. Tachometer, Electronics International, R-1-6 G70R273	X	0.6	91.0
9. Manifold Press Gage, Electronics International M-1	X	0 .8	91.0
10. Oil Press/Temp Gage, Electronics International OPT-1	X	0.6	91.0
11. EGT/CHT Gage, Electronics International US8A	X	1.3	91.0
12. Fuel Qty. Gage, Electronics International FL-2C	X	0 .6	91.0
13. Fuel Qty. Gauge, Acrobatic Tanks Electronics Int'l FL-2C	X	0.6	91.0
14. Fuel Press. Gage, Electronic International M-1-FP100GA	X	0.8	91.0
15. Volt/Amp Gage, Electronics International VA-1A	X	0.6	91.0
16. Vacuum Gage, UMA 3-200-12	X	0.1	91.8
17. Clock, Electronics International SC-5A	X	0 .7	91.0
18. Outside Air Temp (OAT), Electronics International, A-1	X	0.8	91.0

V. Electrical Equipment

Item	Installed	Weight (lbs)	Arm (in)
1. Battery, Concord RG-24-15	X	27.0	54.0
2. Voltage Regulator, Electrosystems, Inc. VR515 GA	X	0.5	57.0
3. Avionics Master Relay, Kissling PN 26.72.01.900	X	0 .9	89.0
4. Starter Relay, Cutler-Hammer SM100D2	X	0.6	57.0
5. Master Electrical Relay, Cutler-Hammer SM100D2	X	0.6	57.0
6. External Power Relay, Cutler-Hammer SM100D2	X	0.6	57.0
7. Landing Gear Relay, Kissling PN26.72.01.900	X	0.9	109.0
8. External Power Receptacle, MS-3506-1	X	1.0	171.5
9. (2) Landing Lights, Whelen 01-0770346-01	X	0.2	97.0
10. (2) Taxi Lights, Whelen 01-0770346-05	X	0.3	97.0
11. Position/Anti-Collision Lights, Whelen A650			
PR-28(L)	X	0.4	98.5
PG-28(R)	X	0.4	98.5
A-500A(T)	X	0.3	284.0
Power Supply, Whelen A413A, HDA-CF	X	2.1	125.0
12. Instrument Panel Lights, Ultra Vision UV-250-1	X	1.2	95.0

VI. Miscellaneous

Item	Installed	Weight (lbs)	Arm (in)
1. Left Seat Assembly, Micco PN430111-901	X	35.6	115.8
2. Right Seat Assembly Micco PN430111-902	X	35.6	115.8
3. Seat Belts/Shoulder Harness, Hooker			
(2) Belts PN206 440	X	1.0 ea	121.0
(2) Harness PN2Y 9047-IR	X	1.6 ea	123.0
4. Flap Actuator, Commercial Aircraft Products D 145-00-61	X	4.5	125.0
5. Fire Extinguisher, H3R Inc. Model RT-A600 Dual-Halon PN8848	X	2.5	142.0
6. Pitot Tube (Heated), AN5812-1	X	0.8	97.5
7. Scott Portable Oxygen System (Optional), Executive Mark I, P/N900019-03	Opt.	8.25	117.78
8. Emergency Locator Transmitter (ELT) Artex ELT-200	X	3.9	159.5

VIII. Auto Pilot Equipment

Note: The following equipment is installed on production aircraft under STC No. SA09432AC-D

All Part Numbers are S-TEC unless otherwise noted.

ITEM	WEIGHT	ARM	MOMENT
1. Turn & Slip Indicator, (Remove United 9013N.5)	-1.6	91.30	-146.08
2, A/P Turn Coordinator/Computer (Add: ST-30, P/N 01260-31-0-28)	+2.3	90.5	+208.15
3. Roll Servo (P/N 0106-R1)	+2.9	128.75	+373.37
4. Pitch Servo (P/N 0108-P5)	+2.9	117.25	+340.02
5. Pitch Computer (P/N 01261-59-28)	+1.1	73.00	+ 80.30
6. Transducer, Pressure (P/N P550-5017)	+ .2	83.00	+16.60
7. Wiring Harness	+4.0	79.00	+316.00
8. Directional Gyro (Exchange IU262-015-12 for IU262-011-15)	N/C	N/C	N/C
TOTAL (Autopilot Installation)	+11.8	100.71	+1188.36