



MOONEY AIRPLANE COMPANY, INC.  
LOUIS SCHREINER FIELD KERRVILLE, TEXAS 78028

FAA APPROVED  
AIRPLANE FLIGHT MANUAL SUPPLEMENT  
FOR

**MOONEY M20M, M20R, M20TN  
WITH  
S-TEC SYSTEM 55X, TWO AXIS, AUTOPILOT INSTALLED**

MODEL NO. \_\_\_\_\_

REG. NO. \_\_\_\_\_

SERIAL NO. \_\_\_\_\_

This Supplement must be attached to the FAA Approved Airplane Flight Manual when the S-TEC 55X, 2 Axis, Automatic Flight Guidance System, ST-839, is installed in accordance with Mooney Drawing Number 830084. The information contained herein supplements and / or replaces the information of the basic Airplane Flight Manual. For Limitations, Procedures and Performance information not contained in this Supplement, consult the basic Airplane Flight Manual.

FAA APPROVED: \_\_\_\_\_



*for*

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## **SECTION I - GENERAL**

### **INTRODUCTION**

This AFM Supplement is to acquaint the aircraft pilot/operator with the features and functions of the S-TEC System 55X, Two Axis Autopilot and to provide operating instructions for the system when installed in the listed aircraft model(s). The aircraft must be operated within the limitations herein provided when the autopilot is in use.



## **SECTION II - OPERATING LIMITATIONS**

### **OPERATING LIMITATIONS**

S-TEC System 55X Pilot's Operating Handbook, P/N 87109, dated 11-08-00 or later must be carried in the aircraft and be available to the pilot while in flight.

1. Autopilot operation prohibited above 185 KCAS.
2. With autotrim installed and not operating or without autotrim installed, use of flaps (flap extension and/or retraction) prohibited.
3. Autopilot coupled missed approach or go-around maneuver not authorized.
4. Autopilot operation prohibited during take-off and landing.
5. Category I operations only.
6. Autopilot use prohibited below 240' AGL during coupled approach operations.

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**SECTION III - EMERGENCY PROCEDURES**

In the event of an autopilot malfunction, or anytime the autopilot is not performing as expected or commanded, do not attempt to identify the system problem. Immediately regain control of the aircraft by overpowering the autopilot as necessary and then immediately disconnect the autopilot. Do not re-engage the autopilot until the problem has been identified and corrected.

1. The autopilot may be disconnected by:
  - a. Depressing the “AP Disconnect” Switch on the left horn of the pilot’s control wheel.
  - b. Placing the “AP Master Switch” in the “OFF” position.
2. Trim:
  - a. In the event of a trim failure, manually control aircraft and DEPRESS AND HOLD “Trim Interrupt/AP Disconnect Switch” on control wheel.
  - b. Place trim master switch in “OFF” position, pull circuit breaker, release interrupt switch.
  - c. Retrim aircraft. Leave trim system OFF until corrected.
3. Altitude loss during a malfunction and recovery:
  - a. The following altitude losses and bank angles were recorded after a malfunction with a 3 second recovery delay:

<u>Configuration</u>	<u>Bank Angle/Altitude Loss</u>
Climb .....	50°/-80'
Cruise .....	58°/-200'
Descent .....	45°/-350'

- b. The following altitude losses and bank angles were recorded after a malfunction with a 1 second recovery delay:

<u>Configuration</u>	<u>Bank Angle/Altitude Loss</u>
Maneuvering .....	18°/-100'
Approach (Coupled or Uncoupled) .....	18°/-100'

The above values are the worst case for all the models covered by this document.

**SECTION IV - NORMAL PROCEDURES**

For detailed normal operating procedures, including system description, pre-flight and in-flight procedures refer to S-TEC System 55X Pilot’s Operating Handbook, P/N 87109, dated 11-08-00 or later revision.

**ELECTRIC TRIM SYSTEM (IF INSTALLED)**

The S-TEC Electric Trim System is designed to accept any single failure, either mechanical or electrical, without uncontrolled operation resulting during operations in the Manual Electric Trim Mode. During autotrim mode the system is designed to limit the effect of any failure causing trim operation. In order to assure proper operation of these safeguards, it is necessary to conduct a simple pre-flight test of the system. Following is the trim pre-flight test procedure:

**ELECTRIC TRIM CHECK (IF OPTIONAL AUTOTRIM IS INSTALLED)**

**Manual Electric Trim - Test Prior to Each Flight**

- a. Trim Switch and A/P Master Switch ..... ON



- b.** Operate Trim Switch (Both Knob Sections) – Nose DN – Check trim moves nose down and trim in motion indicator (“TRIM”) in A/P Programmer flashes. Operate trim switch – Nose UP – Check trim moves nose up and for “in motion” trim light.
- c.** With trim operating Nose UP and DN – grasp manual trim control and overpower electric trim to stop trim action.
- d.** Operate each half of the trim switch separately – trim should not operate unless both switch knob segments are moved together.
- e.** With Trim Operating – Depress trim interrupt switch – Trim motion should stop while interrupt switch is depressed – when released trim should operate normally.

### **Autotrim**

- a.** Engage HDG and VS modes of the autopilot.
- b.** Grasp control and apply forward pressure (NOSE DOWN) – After approximately three (3) seconds trim should run NOSE UP.
- c.** Apply aft pressure (NOSE UP) to control wheel – after approximately three (3) seconds trim should run NOSE DOWN.
- d.** Move manual trim switch UP or DN – Autopilot should disconnect and trim operates in the commanded direction. (Trim Switch will disconnect autopilot only when pitch is engaged.)
- e.** Re-engage autopilot HDG and VS Modes and depress Trim Interrupt/AP Disconnect Switch – Autopilot should disconnect.
- f.** Re-trim aircraft for take-off – Check all controls for freedom of motion and to determine that the autopilot and trim have disconnected.

If either the manual electric or autotrim fails any portion of the above check procedure, move the Trim Master Switch “OFF” and do not attempt to use the trim system until the fault is corrected. With the Trim Master Switch “OFF” the autopilot trim indicators and audio system will return to operation. If the electric trim system suffers a power failure in flight the system will automatically revert to the indicator lights and audio horn. If this occurs turn the Trim Master Switch “OFF” and trim manually, using the indicators until the fault can be located and corrected.

### **GLIDE SLOPE FLIGHT PROCEDURE**

Approach the GS intercept point (usually the OM) with the flaps set as desired at 90 – 109 KCAS and with the aircraft stabilized in altitude hold mode. At the glide slope intercept, lower the landing gear and adjust power for the desired descent speed. For best tracking results make power adjustment in small, smooth increments to maintain desired airspeed. At the missed approach point or the decision height, disconnect the autopilot for landing or for the go-around maneuver (See Limitations Section). If a missed approach is required, the autopilot may be re-engaged after the aircraft has been reconfigured for and established in a stabilized climb.

### **OPTIONAL EQUIPMENT**

#### **ALTITUDE SELECTOR/VERTICAL SPEED SELECTOR P/N 0114 (OPTIONAL)**

The altitude selector option operates in conjunction with an altitude encoder and transponder. For pre-flight and normal operating procedures refer to the “Pilot’s Operating Handbook for Altitude Selector and Altitude Vertical Speed Selector”, P/N 8702, dated 2-91. This option does not affect the limitations or emergency procedures section of this supplement.

#### **ALTITUDE SELECTOR/ALERter/VERTICAL SPEED SELECTOR P/N 0140 (OPTIONAL)**

The altitude selector/alerter option is a digital device providing a digital liquid crystal display of the selected altitude, the vertical speed and other functions. The altitude selector function operates in conjunction with an altitude encoder and transponder. For pre-flight and normal operating procedures refer to the “Pilot’s Operating Handbook for Altitude Selector/Alerter”, P/N 8716,



dated 10-93. This option does not affect the limitations or emergency procedures section of this supplement.

**NOTE:**

**When using either of the above referenced Altitude Selectors with the System 55X Autopilot, the pilot should always program the desired altitude and vertical speed into the altitude selector before simultaneously pressing ALT and VS modes on the System 55X Autopilot programmer. This action will isolate the VS selector knob on the autopilot and the aircraft will respond only to the respective altitude selector commands until capturing the desired altitude.**





## **SECTION V - PERFORMANCE**

No change in SECTION V.

## **SECTION VI - WEIGHT AND BALANCE**

No change in SECTION VI.

## **SECTION VII - SYSTEM DESCRIPTIONS**

No change in SECTION VII.

## **SECTION VIII – HANDLING AND SERVICING**

No change SECTION VIII.

## **SECTION IX – SUPPLEMENTAL DATA**

Add this supplement to this Section.

## **SECTION X – SAFETY TIPS**

No change SECTION X.

