

MOONEY AIRCRAFT CORPORATION

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FAA APPROVED

AIRPLANE FLIGHT MANUAL SUPPLEMENT

FOR

MOONEY MODELS M20J AND M20K

WITH

KING KAS 297B VERTICAL SPEED AND ALTITUDE SELECTOR

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

SER. NO. \_\_\_\_\_

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

This supplement must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual (AFM) when the KAS 297B Vertical Speed and Altitude Selector is installed in accordance with Mooney Drawing No. 830125. The information contained herein supplements or supersedes the Mooney, King KFC Series AFCS Supplement and the basic AFM in those areas listed. For limitations, procedures, and performance information not contained in this supplement, consult the Mooney, King KFC Series AFCS Supplement and the basic Airplane Flight Manual (AFM).

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LOG OF REVISIONS

Revision Number	Revised Pages	Description of Revision	FAA Approved*	Date

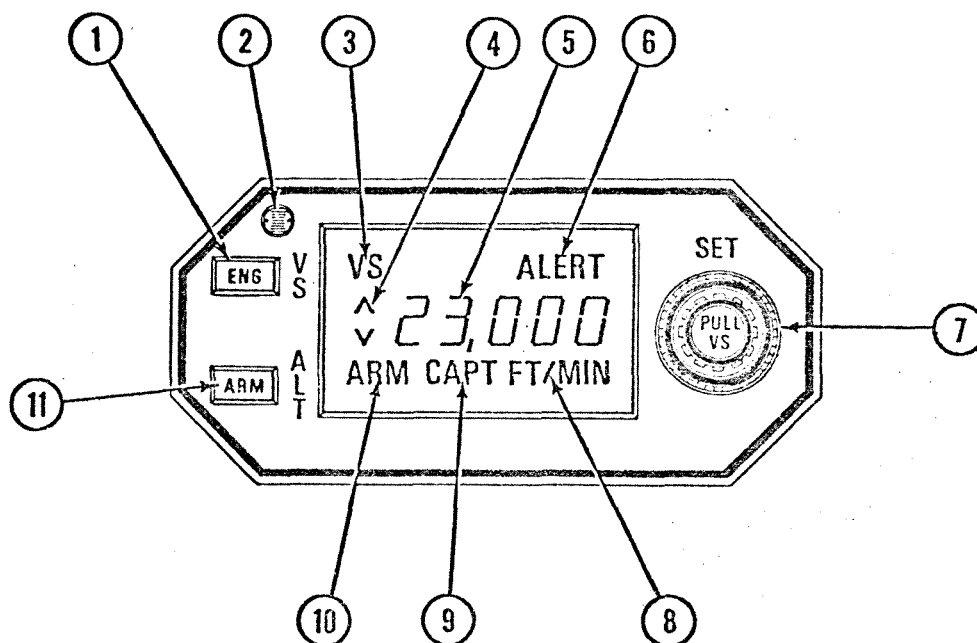
The revised portions of affected pages are indicated by vertical black lines in the margin.

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SECTION I - GENERAL

This supplement is provided to acquaint the pilot with the limitations as well as the normal and emergency operating procedures of the King KAS 297B Vertical Speed and Altitude Selector when added to a KFC 150 or a KAP 150 Flight Control System.

The KAS 297B provides the pilot with the following features: ability to select vertical speed hold; ability to select, arm and, upon approaching the selected altitude, automatically transfer into Altitude Hold; altitude alerting as specified by FAR 91.51. The KAS 297B controls and display are described in Figure 1 and corresponding paragraphs.



KAS 297B VERTICAL SPEED AND ALTITUDE SELECTOR  
FIGURE 1

## CONTROL FUNCTION DESCRIPTION

1. VERTICAL SPEED MODE (ENG) BUTTON - When pressed will engage the Vertical Speed Hold mode. When pressed a second time will disengage the Vertical Speed Hold mode.
2. PHOTOCELL - Automatically dims display according to the cockpit ambient light.

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SECTION I - GENERAL, Cont.

3. VERTICAL SPEED (VS.) ANNUNCIATOR - Illuminates when the Vertical Speed Hold mode is engaged.
4. VERTICAL SPEED UP/DOWN CARETS (  $\nabla$  ) - Indicates whether the selected vertical speed is up or down.
5. GAS DISCHARGE DISPLAY - Displays selected altitude from 100 to 35,000 feet or the selected vertical speed from 0 to 3,000 feet per minute up or down.
6. ALTITUDE ALERT (ALERT) ANNUNCIATOR - The Alert annunciator is illuminated 1000 feet prior to the selected altitude, goes out 300 feet prior to the selected altitude and illuminates momentarily when the selected altitude is reached. Once the selected altitude is reached the light signifies that the 300 feet "safe band" has been exceeded and will remain on until 1000 feet from the selected altitude. The alert light is accompanied by a 2 second aural tone anytime the light initially comes on or the selected altitude is reached.
7. VERTICAL SPEED/ALTITUDE SELECT KNOB - Concentric knobs which allow easy setting of altitude or vertical speed. The small knob (inner) has an in and out position.

Altitude is displayed and selected when the small knob is in the "IN" position. When rotated the small knob selects altitude in 100 foot increments with roll over into the 1000 digits. The larger knob (outer) selects altitude in 1000 foot increments with roll over into the 10,000 digits.

Vertical speed is displayed and selected when the small knob is in the "out" position. When rotated the small knob selects vertical speed in 100 fpm increments. The larger knob selects vertical speed in 1000 fpm increments up to a maximum of 3000 fpm.

8. MODE (FT or FT/MIN) ANNUNCIATOR - Indicates FT/MIN when in the Vertical Speed Hold mode and FT when in the Altitude Select mode.
9. ALTITUDE CAPTURE (CAPT) ANNUNCIATOR - Indicates the KAS 297B has switched the autopilot from Pitch Attitude Hold or Vertical Speed Hold mode into the pitch roundout mode (CAPT). The point, just prior to transfer into Altitude Hold, at which the CAPT mode becomes active varies with the vertical speed, i.e.

SECTION I - GENERAL, Cont.

9. (Con't)
- The higher the rate of climb, the sooner the CAPT mode becomes active; at low rates of climb the activation of the CAPT mode and transfer to altitude hold occur almost simultaneously.
10. ALTITUDE SELECT ARM (ARM) ANNUNCIATOR - Indicates that the Altitude Select mode is armed to capture the selected altitude.
11. ALTITUDE SELECT MODE (ARM) BUTTON - When pressed and the selected altitude is displayed, will arm the Altitude Select mode. The Altitude Select (ARM) mode will cancel altitude hold (ALT) if ALT is already engaged. If Altitude Select (ARM) mode is present when GS couple occurs, the GS mode will cancel Altitude Select (ARM) mode. The engagement of ALT by the pilot's use of the ALT switch will cancel the Altitude Select (ARM) mode. Reselection of a new altitude will also cycle the Altitude Select (ARM) mode off.
12. CONTROL WHEEL STEERING (CWS) BUTTON (Not Shown)- When pressed, in addition to the normal autopilot functions the CWS also interfaces with the KAS 297B. When operating in the Vertical Speed Hold mode, the CWS will re-sync the Vertical Speed Hold mode to the current vertical speed of the airplane. If altitude is displayed when the CWS is pressed, the display will automatically display vertical speed as long as the CWS is depressed. CWS does not affect the Altitude Select mode.
13. VERTICAL TRIM CONTROL (Not Shown) - When in the Vertical Speed Hold mode this control can be used to slow the vertical speed up or down at 100 fpm for every second the rocker switch is held down. If altitude is being displayed at the time the rocker switch is depressed, vertical speed will be displayed until 1-2 seconds after the rocker switch is released.

The following circuit breakers are used to protect the following elements of the King KAS 297B.

<u>LABEL</u>	<u>FUNCTION</u>
AUTOPILOT	Supplies power to the KC 192 or the KC 191 computer, the autopilot pitch and roll servos, the Elev Trim Switch/Circuit Breaker, and the KAS 297B.
ENCODING ALT	Supplies power to the King KEA 130A Altimeter.

SECTION II - LIMITATIONS

- A. Altitude Select captures below 800 feet AGL are prohibited.
- B. The addition of the King KAS 297B vertical speed and altitude selector must be installed with the King KFC 150 Series Flight Control System and imposes no additional limitations to those defined in the supplement for the KFC 150 Series Flight Control System.

SECTION III - EMERGENCY PROCEDURES

No Change.

SECTION IV - NORMAL PROCEDURES

A. PREFLIGHT

- 1. PREFLIGHT TEST BUTTON (KC 192 or KC 191)- PRESS momentarily and NOTE:

- a. All legends and digits are displayed on the KAS 297B.

B. VERTICAL SPEED AND ALTITUDE SELECTOR OPERATION

- 1. Vertical Speed Select

- a. VERTICAL SPEED SELECT Knob - PULL small knob to the "OUT" position.
  - b. VERTICAL SPEED SELECT Knob - ROTATE until desired vertical speed is displayed.
  - c. VERTICAL SPEED MODE (ENG) Button - PUSH to engage the Vertical Speed Hold mode.

- 2. Changing Vertical Speed

- a. Using CWS

- 1) CWS Button - PRESS and HOLD.
    - 2) Airplane - Establish desired vertical speed.
    - 3) CWS Button - Release.

- b. Using Vertical Trim Control

- 1) VERTICAL TRIM CONTROL - PRESS either up or down to increase or decrease the vertical speed. Displayed vertical speed changes 100 fpm for every second the control is held down.

SECTION IV - NORMAL PROCEDURES, Cont.

**CAUTION**

WHEN OPERATING AT OR NEAR THE BEST RATE OF CLIMB AIRSPEED AND USING VERTICAL SPEED HOLD, IT IS EASY TO DECELERATE TO AN AIRSPEED ON THE BACK SIDE OF THE POWER CURVE (A DECREASE IN AIRSPEED RESULTS IN A REDUCED RATE OF CLIMB). CONTINUED OPERATION ON THE BACK SIDE OF THE POWER CURVE IN VERTICAL SPEED HOLD MODE WILL RESULT IN A STALL.

**CAUTION**

WHEN OPERATION AT OR NEAR THE MAXIMUM AUTOPILOT SPEED, IT WILL BE NECESSARY TO REDUCE POWER IN ORDER TO MAINTAIN THE DESIRED RATE OF DESCENT AND NOT EXCEED THE MAXIMUM AUTOPILOT SPEED.

C. ALTITUDE PRESELECT

1. ALTITUDE SELECT Knob - PUSH small knob to the "IN" position.
2. ALTITUDE SELECT Knob - ROTATE until the desired altitude is displayed.
3. ALTITUDE SELECT MODE (ARM) Button - PUSH to arm the Altitude Select Mode.
4. Airplane - ESTABLISH ALTITUDE necessary to intercept the selected altitude.

SECTION V - X

No Change.