

S-TEC CORPORATION  
MINERAL WELLS, TEXAS 76067

FAA/DAS APPROVED  
PILOT'S OPERATING HANDBOOK AND/OR  
AIRPLANE FLIGHT MANUAL SUPPLEMENT

FOR  
CESSNA MODELS 210N AND T210N AND THESE MODELS  
WHEN MODIFIED PER STC SA756NW (ROBERTSON STOL)

WITH  
S-TEC SYSTEM 55 TWO AXIS  
AUTOMATIC FLIGHT GUIDANCE SYSTEM  
(28 VOLT SYSTEM)

REG. NO. N2306D

SER. NO. 210-63828

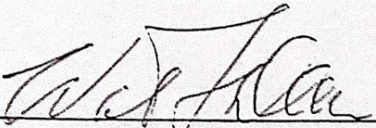
This Supplement must be attached to the applicable FAA Approved Airplane Flight Manual, Pilot's Operating Handbook, or Pilot's Operating Handbook and FAA Approved Airplane Flight Manual modified by the installation of S-TEC System 55 Autopilot Model ST-566 installed in accordance with STC SA8896SW-D. The information contained herein supplements or supersedes the basic manual. For limitations, procedures and performance information not contained in this supplement, consult the basic Pilot's Operating Handbook and/or Airplane Flight Manual.

SECTION I

GENERAL

This manual is to acquaint the pilot with the features and functions of the System 55 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.

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Walter F. Davis

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SECTION II

LOG OF REVISIONS

<u>REV. NO.</u>	<u>PAGES AFFECTED</u>	<u>DESCRIPTION</u>	<u>APPROVED</u>	<u>DATE</u>
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1. Autopilot operation not authorized above 165 KIAS.
2. Autopilot use prohibited with flap extension of more than 18°.
3. Flap extension limited to 115 KIAS when Optional Autotrim System is not installed.
4. Flap extension limited to 140 KIAS, or below, when Optional Autotrim System is installed.
5. Staggered or missed approach maneuver not authorized.
6. Autopilot use prohibited when VFR flight is being conducted.
7. Autopilot use prohibited when VFR flight is being conducted.

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SECTION II

OPERATING LIMITATIONS

1. Autopilot operation not authorized above 165 KIAS.
2. Autopilot use prohibited with flap extension of more than 10°.
3. Flap extension limited to 115 KIAS when Optional Autotrim System is not installed.
4. Flap extension limited to 140 KIAS, or below, when Optional Autotrim System is installed.
5. Go-around or missed approach maneuver not authorized.
6. Autopilot must be "OFF" during take-off and landing.
7. Category I operations only.

SECTION III

EMERGENCY OPERATING 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.

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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.
  - c. Momentarily interrupting aircraft electrical power at the battery master switch.
  - d. Pulling the autopilot circuit breaker.
2. Trim: (IF INSTALLED)
  - 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	58°/NONE
Cruise	60°/-500'
Descent	60°/-340'
  - 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	20°/-120'
Approach (Coupled or Uncoupled)	22°/-140'

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

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#### SECTION IV

##### NORMAL OPERATING PROCEDURES

For detailed normal operating procedures, including system description, pre-flight and inflight procedures refer to S-TEC System 55 Pilot's Operating Handbook, P/N 8747, dated 9-93.

##### 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.

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### 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. Reengage autopilot HDG and VS Modes and depress Trim Interrupt/AP Disconnect Switch - Autopilot should disconnect.
- f. Retrim 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.

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### GLIDE SLOPE FLIGHT PROCEDURE

Approach the GS intercept point (usually the OM) with the flaps set to approach deflection of 10° (See Limitations Section) 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 adjustments 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 reengaged 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.

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NOTE: When using either of the above referenced Altitude Selectors with the System 55 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 55 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

OPERATIONAL DATA

The text of this Section not affected by the installation of this equipment.

SECTION VI

REQUIRED OPERATING EQUIPMENT

The text of this Section not affected by installation of this equipment.

SECTION VII

WEIGHT AND BALANCE

The text of this section not affected by installation of this equipment

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