

SECTION IV.

APPENDIX

S-TEC CORPORATION
MINERAL WELLS, TEXAS 76067

FAA/DAS APPROVED
PILOT'S OPERATING HANDBOOK AND/OR
AIRPLANE FLIGHT MANUAL SUPPLEMENT
FOR
CESSNA MODELS 172R AND 172S

WITH
S-TEC SYSTEM 30 ALT (ALTITUDE HOLD)
(28 VOLT SYSTEM)

REG. NO. N643SP

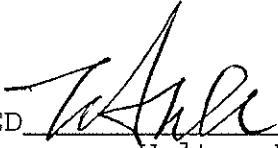
SER. NO. 172S8051

This Supplement must be attached to the applicable FAA Approved Pilot's Operating Handbook and/or Airplane Flight Manual, modified by the installation of the S-TEC System 30 ALT Altitude Hold System Model ST-673 installed in accordance with STC SA09214AC-D. The information contained in this document supplements or supersedes the basic manual only in those areas listed. For limitations, procedures and performance information not contained in this supplement, consult the basic airplane flight manual.

SECTION I

GENERAL

This manual is to acquaint the pilot with the features and functions of the System 30 ALT Altitude Hold System when installed in the listed aircraft model(s). The aircraft must be operated within the limitations herein provided when the pitch system is in use.

FAA/DAS APPROVED 
Walter F. Davis

S-TEC CORPORATION
DAS 5 SW
P/N: 891376
DATE: 5-16-97

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LOG OF REVISIONS				
REV. NO.	PAGES AFFECTED	DESCRIPTION	APPROVED	DATE
1	All	Added Cessna Model 172S.	<i>WFD</i>	9-25-98

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SECTION II

OPERATING LIMITATIONS

1. Altitude Hold use prohibited above: 130 KIAS.
2. Altitude Hold use prohibited during flap extension or retraction.
3. Altitude Hold must be off for take-off and landing.
4. During Altitude Hold operation limit bank angles to 30 degrees or less.

SECTION III

EMERGENCY OPERATING PROCEDURES

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

1. Disconnect:
The system may be disconnected by:
 - a. Depressing the face of the ALT Hold ON/OFF Switch.
 - b. Placing the ALT HOLD POWER Switch in the OFF position.
 - c. Pressing the Optional control wheel mounted ALT Engage/Disengage switch.

2. Altitude loss during a malfunction and recovery:
 - a. The following altitude loss was recorded after a malfunction with a 3 second recovery delay:

<u>Configuration</u>	<u>Altitude Loss</u>
Cruise	-200'

- b. The following altitude loss was recorded after a malfunction with a 1 second recovery delay:

<u>Configuration</u>	<u>Altitude Loss</u>
Maneuvering	-90'

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NORMAL OPERATING PROCEDURES

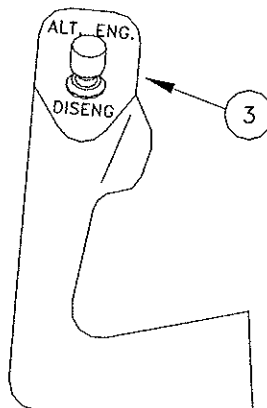
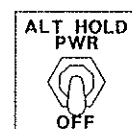
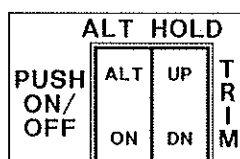
4-1 SYSTEM DESCRIPTION

The System 30 ALT Altitude Hold System is a pure rate system providing control of the aircraft pitch axis only. The system does not include or use a gyro or any of the panel instruments.

Pitch axis control is provided by deriving altitude position and altitude error from a solid state absolute pressure transducer. The basic pitch mode provided is altitude hold for maintaining a selected altitude (pressure) level.

The system is entirely electrical and operates with very low power consumption. The 30 ALT System consists of primarily of a pitch servo, a pressure transducer, a pitch computer module and a panel mounted off/on switch which also contains the up/down trim prompter lights. The trim up/down lights maintain a constant intensity level but the "ALT" and "ON" light intensity is pilot adjustable.

4-2 COCKPIT CONTROL AND FUNCTIONS



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1. ALT Hold OFF/ON Switch And Annunciator Panel - Green "ON" and "ALT" annunciators will illuminate when the altitude hold is engaged. A yellow trim UP or DOWN light will illuminate when the system is engaged and a need for trim is present. Example: an UP light indicates a need for UP elevator trim. A steady audio alert will accompany a trim light. After approximately five seconds, if the pilot fails to trim the aircraft the trim light will begin to flash accompanied by a beeping audio alert sound. When both lights are extinguished the aircraft is in trim longitudinally.
2. ALT Hold Power - This is the master power switch for the 30 ALT System. This switch must be on before the "ALT Hold" switch will function.
3. Optional ALT Engage/Disengage - This is an optional control wheel switch that permits the pilot to engage or disengage the altitude hold from the control wheel, once the panel mounted switch (item 1) has been powered up and activated.

4-3 PRE-FLIGHT PROCEDURES

NOTE: During system functional checks the system must be provided adequate D.C. voltage (12.0 VDC or 24 VDC minimum, as appropriate).

1. Mandatory Preflight Test: Each time the altitude hold power is switched on the system will go through a test procedure that tests all the annunciator lights and the integral pitch accelerometer circuitry. The following events should occur during the test:
 - a. All lights on the switch should illuminate.
 - b. Trim UP light extinguishes.
 - c. Trim DN light extinguishes.
 - d. All lights extinguish.
 - e. The system is ready for engagement after approximately 15 seconds.

If the system fails the test the altitude hold cannot be engaged and service is required.

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Caution: The required pre-flight test can be conducted in flight if necessary. It should be noted, however, that when the trim lights are flashing the pitch servo will momentarily engage and disengage as part of the test function, therefore, maneuvering flight should be avoided during the test.

2. Center the elevator control and engage the altitude hold. Note that the pitch servo engages.
3. Apply moderate back pressure on the elevator control and after approximately three seconds the trim DN light should illuminate.
4. Apply forward pressure on the elevator control and note that the trim UP light illuminates.
5. Disconnect the altitude hold either by pressing on the face of the altitude hold switch or using the optional (if installed) altitude engage/disengage switch on the control wheel.
6. Verify that the pitch servo has disengaged.

4-4 IN FLIGHT PROCEDURES

1. At the desired altitude press the altitude hold switch. The altitude hold will engage at the precise pressure level existing at engagement.
2. Trim the elevator according to the trim light indications on the altitude hold annunciator panel.
3. Disengage the altitude hold for climb or descent modes of flight.

SECTION V

PERFORMANCE

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

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SECTION VI

WEIGHT AND BALANCE

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

SECTION VII

DESCRIPTION AND OPERATION OF THE AIRPLANE AND ITS SYSTEMS

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

SECTION VIII

AIRPLANE HANDLING, SERVICING AND MAINTENANCE

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

SECTION IX

SUPPLEMENTS

Refer to Contents of this Supplement for operation of system 30 ALT.

SECTION X

OPERATING TIPS

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