

General Introduction, System 55



S-TEC autopilots have become the most popular automatic flight control systems among operators of light single-engine and multi-engine aircraft. The reasons are many, but chief among them is S-TEC's superior technology. Through it, S-TEC eliminates many of the deficiencies and errors inherent with systems that are dependent on artificial horizon gyros and aircraft vacuum systems. At the same time, S-TEC autopilots provide sophisticated features and flight functions normally found only in heavy aircraft systems.

The S-TEC System 55 is a pure rate based autopilot offering smooth, precise and dependable performance, unsurpassed by competitive systems.

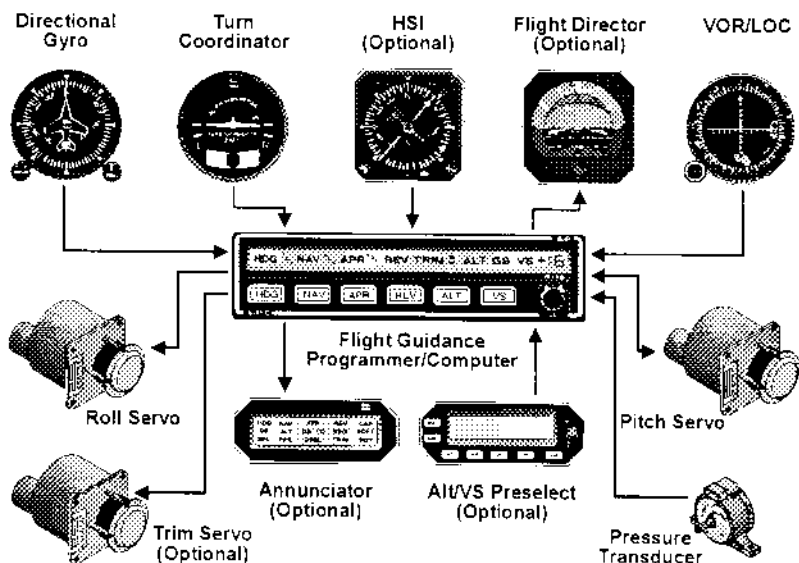
The System 55's roll axis has heading select, VOR/Localizer front and back course intercept and tracking. It can be interfaced with RNAV, GPS or LORAN systems which provide standard autopilot outputs. All radio couplers are standard.

Automatic 3-level gain scheduling in the NAV mode results in smooth, precise tracking, and virtually eliminates annoying zigzagging, even at station passage.

The System 55 derives pitch axis information from a solid-state absolute pressure Transducer and a sensitive accelerometer. Therefore, they provide precise pitch axis altitude hold, automatic/manual glideslope intercept and capture, and vertical speed commands totally independent of the aircraft's artificial horizon gyro, or vacuum system. They deliver extremely accurate altitude, vertical speed and vertical acceleration data to the system's pitch computer, regardless of aircraft flight attitude.

Optional equipment available for the System 55 includes a Horizontal Situation Indicator, which can be substituted for the standard Directional Gyro; an accelerometer controlled Yaw Damper/rudder trim system; Automatic Elevator Trim; Altitude/Vertical Speed preselect in two different models, and a single-cue Flight Director Steering Horizon.

SYSTEM 55 SCHEMATIC



SYSTEM 55 MODES OF OPERATION

The **System 55 Flight Guidance Programmer/Computer** serves the function of converting pilot commands to logic signals for the roll and pitch computer functions. As the pilot enters the desired mode by pressing the appropriate mode selector switch, the computer acknowledges the mode, causing the appropriate annunciator to illuminate.

The Roll Computer receives signal inputs from the Directional Gyro or optional H.S.I., VOR/LOC, RNAV, Loran or GPS Deviation Indicators and the Turn Coordinator. It computes roll servo commands for stabilization, turns, radio intercepts and tracking.

The pitch computer receives signal inputs from the altitude pressure Transducer, Accelerometer, Glideslope Deviation Indicator and Vertical Speed Modifier Control or optional Altitude Selector/Alerter or Altitude/Vertical Speed Selector. It computes pitch servo commands for vertical speed, altitude hold and glide slope intercept and tracking. Sensing for trim annunciation or optional automatic elevator trim is provided by the pitch servo. Drive for the optional elevator trim servo is provided by the pitch computer.

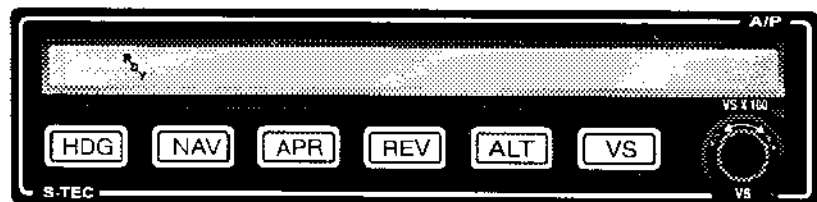
SYSTEM 55 PREFLIGHT PROCEDURE

The System 55 incorporates a **SELF TEST** which must pass before the autopilot can be engaged. To perform the test, aircraft D.C. electrical power must be on and supplied to the autopilot.

Place the **AUTOPILOT MASTER** switch to the **ON** position and observe that all segments of the Programmer/Computer display and optional Annunicator, if installed, illuminate for 5 seconds during the test.



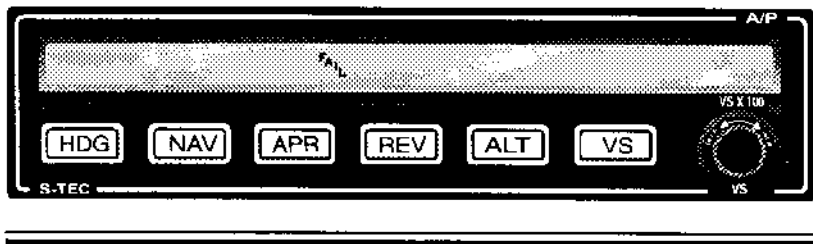
Satisfactory completion is indicated by only **RDY** remaining on at the conclusion of the 5 second test.



Should a fault be detected, the **FAIL** annunciation will remain on at the conclusion of the test and the autopilot can not be engaged.

If the the autopilot detects the Turn Coordinator rotor speed as low or not turning, the display will remain blank, and the autopilot can not be engaged.

If this condition occurs, you should consult your dealer before other use of the autopilot is attempted.



Preflight Test Without Optional Autotrim

Center the control wheel. Press and release the **Control Wheel Steering (CWS)** switch. **CWS** and **VS** should annunciate. Move the aircraft control wheel in both the roll and pitch axes to overpower the autopilot servos. Control motions should be smooth, without looseness or free play. Press the control wheel **Disconnect** switch. **RDY** will flash then annunciate steady. An audible tone should be heard indicating the autopilot disconnect. Move the aircraft controls to ensure freedom and confirm the autopilot has disconnected. If optional autotrim is not installed, this concludes the preflight test.

Preflight Test With Optional Autotrim

With the aircraft controls centered, grasp the control wheel and press and release the **Control Wheel Steering (CWS)** switch. *CWS* and *VS* should annunciate. Push forward on the control wheel. After about 3 seconds, trim should run "nose up". Pull control wheel aft. After about 3 seconds, trim should move "nose down". Move the aircraft control wheel in both the roll and pitch axes to overpower the autopilot servos. Control motions should be smooth, without looseness or free play. Move **Manual Trim Switch** up and down. The autopilot should disengage. *RDY* will flash then annunciate steady. Trim should operate in the commanded direction. (The **Trim Switch** will disengage the autopilot only when a pitch mode is engaged.) Re-engage **CWS** mode and press the **Trim Interrupt/AP Disconnect** switch. The autopilot should disengage. *RDY* will flash, then annunciate steady. An audible tone should be heard indicating the autopilot disconnect.

Retrim aircraft for takeoff and check controls for freedom of movement. Be sure the autopilot and trim are disengaged.

NOTE: IF EITHER THE MANUAL ELECTRIC TRIM OR AUTOTRIM FAILS ANY PORTION OF THE PREFLIGHT TEST, TURN THE TRIM MASTER SWITCH OFF. DO NOT USE THE ELECTRIC TRIM UNTIL THE FAULT IS CORRECTED. WITH TRIM MASTER SWITCH OFF, THE AUTOPILOT TRIM INDICATORS AND AUDIO WARNING ARE ACTIVATED. IF THE ELECTRIC TRIM FAILS, OR HAS AN IN-FLIGHT POWER FAILURE, THE SYSTEM AUTOMATICALLY REVERTS TO OUT-OF-TRIM ANNUNCIATION AND AUDIO WARNING. SHOULD THIS OCCUR, TURN THE TRIM MASTER SWITCH OFF, AND REVERT TO MANUAL TRIM UNTIL THE FAULT IS CORRECTED.
