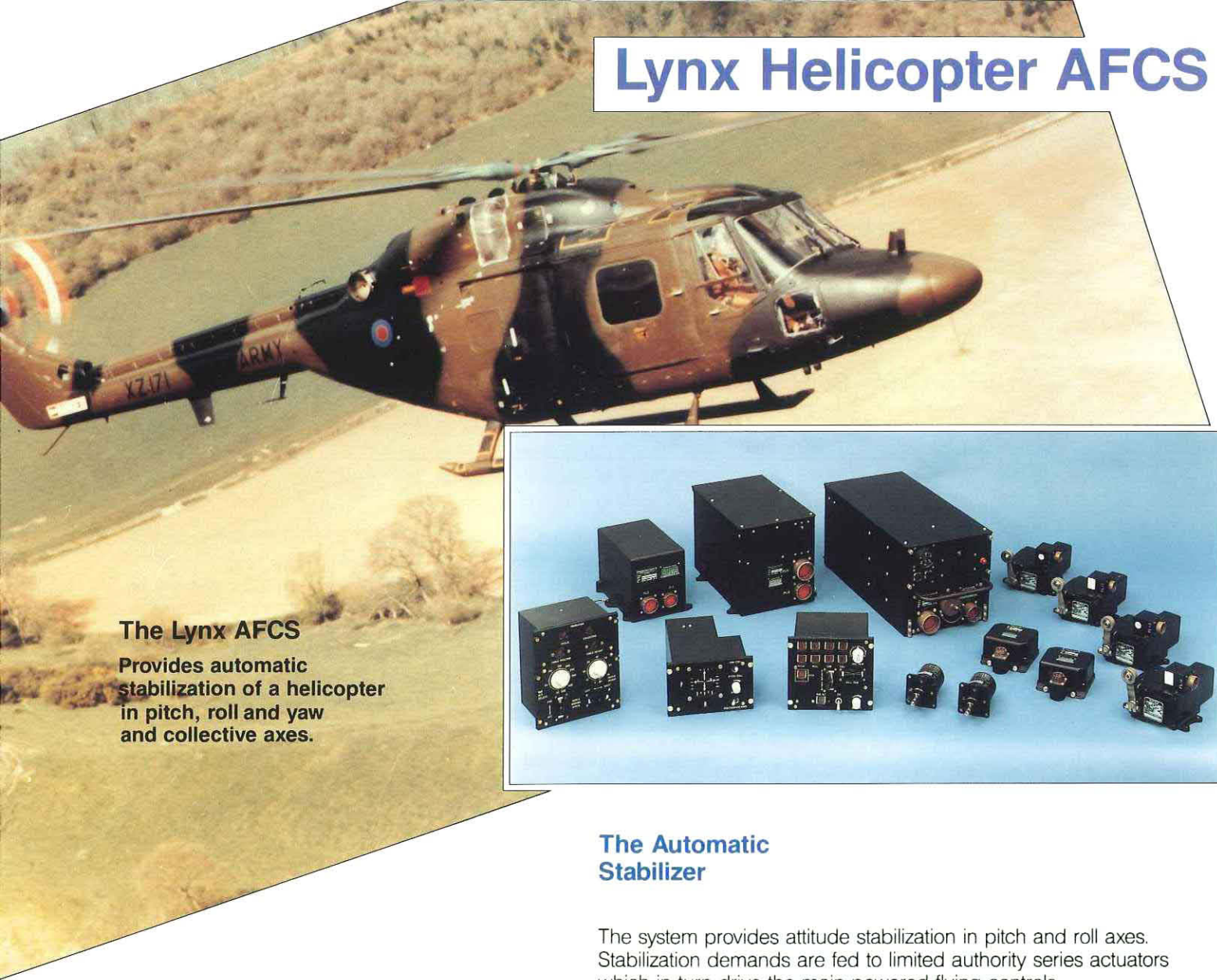


# Lynx Helicopter AFCS



## The Lynx AFCS

Provides automatic stabilization of a helicopter in pitch, roll and yaw and collective axes.



## The Automatic Stabilizer

The system provides attitude stabilization in pitch and roll axes. Stabilization demands are fed to limited authority series actuators which in turn drive the main powered flying controls.

All autostabilization channels are fully duplicated with monitoring circuits to indicate discrepancy between lanes.

The autostabilizer is active throughout the flight envelope and is also operational during autopilot flying.

A unique feature of the autostabilizer is the introduction of Collective Acceleration Control (CAC) to provide additional pitch axis stability by sensing normal aircraft acceleration and applying a collective pitch demand to combat the pitch rate divergence and instability at high forward speed and aft CG.

## The Autopilot

The autopilot modes of Barometric Altitude, Radio Altitude, Radio Altitude Acquire and Heading Hold operate in their respective axes individually or in a combination. Transition and Cable modes require simultaneous control functions in pitch, roll and collective axes.

All autopilot control signals are fed into the limited authority series actuators and also into full authority parallel actuators which operate to prevent series actuator saturation during autopilot manoeuvres.

All autopilot channels are duplicated in the collective axis but are simplex in pitch, roll and yaw axes.

A number of autopilot facilities are also available:

- Heading Hold
- Barometric Altitude Hold
- Radio Altitude Acquire and Hold
- Automatic Transition
- Sonar Cable Hold (Angle and Height)

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**Computer Acceleration Control** Houses the electronic modules and accelerometers required for the collective stabilization functions and lateral acceleration computing for augmenting yaw stabilization for Army version and ASW variants. *6¼" wide x 5½" high x 8¼" deep.*

**Computer AFCS** Contains the system logic, interface circuits, computing and actuator drive electronics. All circuits are contained on 6" x 4" printed circuit plug in modules. The computer houses up to 21 modules in ¾ ATR (long) package. System BITE facilities are also included within the main computer unit.

**ASW Computer** Contains the electronic modules required for the ASW role and is used in conjunction with the main AFCS computer and the CAC unit to provide Radio Altitude Acquire, Transition and Cable (Angle and Height Control) modes. The computer houses 17 + 1 spare modules. *8¼" wide x 8" high x 11¾" deep.*

**Engaging Controller** Provides pilot control for the engagement of the total autostabilizer and the disengagement of each autostabilizer lane in each axis, also the engagement of each autopilot mode with the exception of the Cable and Transition modes. The controls for these modes are provided on a separate controller. Facilities are also provided for pitch, roll and heading trimming. All switches are illuminated on engagement. *5¾" wide x 5¼" high x 5¾" deep.*

**Test Controller** A cockpit mounted unit designed to provide a means of in-flight monitoring of the control signals to, or the position of, each series actuator. It is also used in conjunction with BITE to provide 1st line test facility for the system. *5¾" wide x 3¾" high x 9" deep.*

**ASW Controller** Provides facilities for engagement of Transition and Cable modes and the means whereby the pilot can select height acquire altitude, hover altitude, and fore and aft and lateral ground speed required at the completion of transition. *5¾" wide x 6¾" high x 5½" deep.*

**Parallel Actuators** Electromechanical actuators providing a rotary output of nominally  $\pm 60^\circ$ , for autopilot functions. They are also controlled direct from pilot's stick switch in pitch and roll for trim adjustments in those axes.

**Yaw Rate Gyros** The yaw rate gyro provides information for the Yaw Autostabilizer and a dc signal proportional to aircraft yaw rate. *3½" wide x 2¼" high x 5" deep.*

**Stick Position Transmitters** Provides a signal proportional to cyclic stick position. *2" wide x 2" high x 5½" deep.*

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