

Tornado Flight Control System

GEC Avionics, Combat Aircraft Controls Division is responsible for the Flight Controls System for the Tornado front line combat aircraft.

The system comprises:

- Autopilot and Flight Director System (AFDS)
- Command Stability Augmentation System (CSAS)
- Spin Prevention and Incidence Limiting System (SPILS)

These high integrity equipments and their relationship are shown in Figure 1. The centre fold provides a summary of the equipment performance, together with a picture showing the equipment which makes up the Flight Control System (FCS)

The Tornado FCS is specifically designed to meet the rugged all-weather, day/night, low level operational requirements of the aircraft. The aircraft is able to survive a single failure without operational limitation; while a second failure results in fail-safe operation. The FCS controls the rudder, tailerons and spoilers. In addition the two tailerons have mechanical reversion.

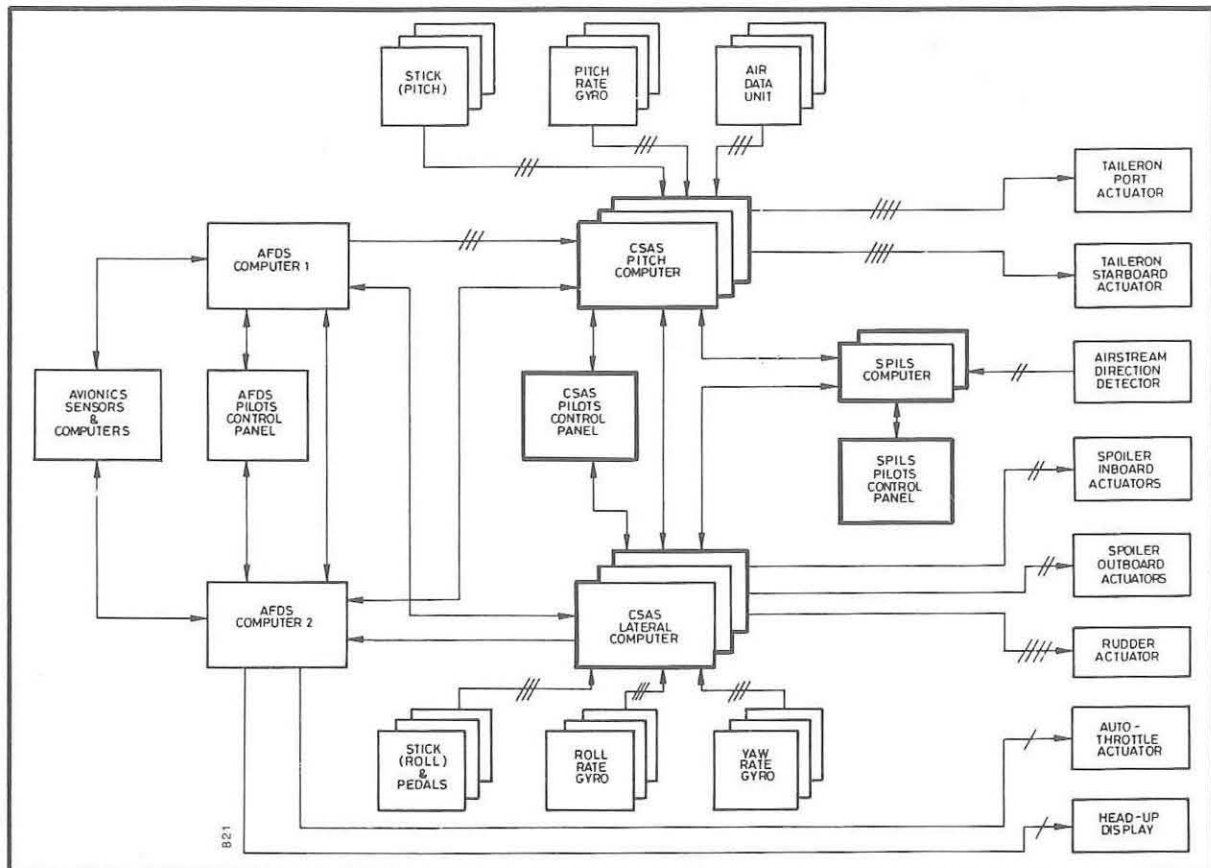


Figure 1

The AFDS comprises two $\frac{3}{4}$ ATR short LRU which provide duplex digital autopilot and flight director functions. In addition to usual autopilot modes the Tornado GR1 terrain following signals are processed within the AFDS to provide both automatic and manual output to the CSAS and Head Up display respectively. The CSAS receives demand inputs either from the pilot via the stick or from AFDS. CSAS is a triplex axis-orientated system with fourth lane consolidation to meet the high safety of flight requirements of the Tornado. The CSAS is housed in two 1 ATR LRU. SPILS is housed in a $\frac{1}{2}$ ATR short LRU and provides the capability for carefree aircraft handling throughout the Tornado performance envelope.

Over 1000 flight control systems have already been delivered. The system has been in service for over 10 years and has surpassed all operational performance and availability goals in the most rigorous environments including the recent Gulf conflict.

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