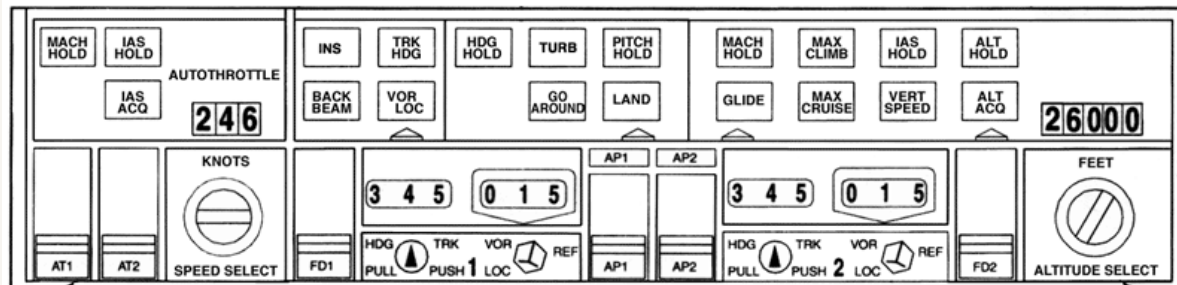


Concorde – State of the Art Flight System

By Chinmay Das.

Though the flight systems used in Concorde are very common these days, they were major breakthroughs in the 70s. This article tries to encapsulate some of the major introductions in the flight systems of Concorde SST.

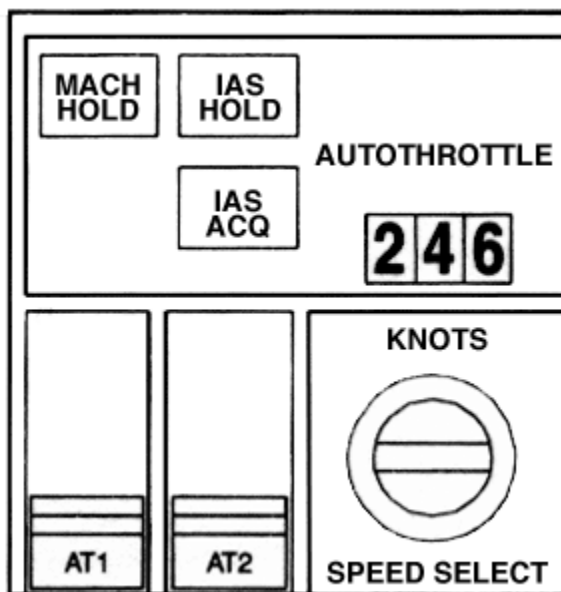


This is a graphic of the Concorde cockpit control panel.

The topmost row contains options for various auto-throttle and auto-pilot missions, which have been explained further.

AUTOTHROTTLES

Autothrottles give control signals to the electronic control of the engines. There is a main channel and a standby channel, with the main channel given priority. If any malfunction is detected by the system, Autothrottle is disengaged automatically.



Following are the 3 autothrottle modes:

MACH HOLD - maintain the current Mach no, used during cruise

IAS HOLD - hold the indicated air speed that the aircraft was flying at when the system was engaged

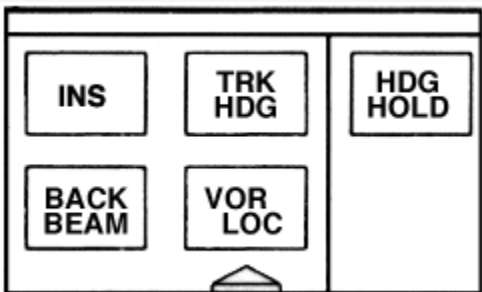
IAS ACQ - The aircraft goes to a target airspeed (given by the pilot) and on reaching the speed, switch back to IAS HOLD.

AUTOPILOT

Concorde has 2 autopilot systems, one of which is a spare during cruise. Both are engaged while auto-landing. The backup automatically takes over, should the primary one fail.

Landing (touchdown) is done automatically without pilot intervention using Airport Instrument landing System's (ILS) Glideslope and Localiser and pilot stops the aircraft.

AUTOPILOT HORIZONTAL MODES



INS - fly between 2 given waypoints using the external Inertial Nav System

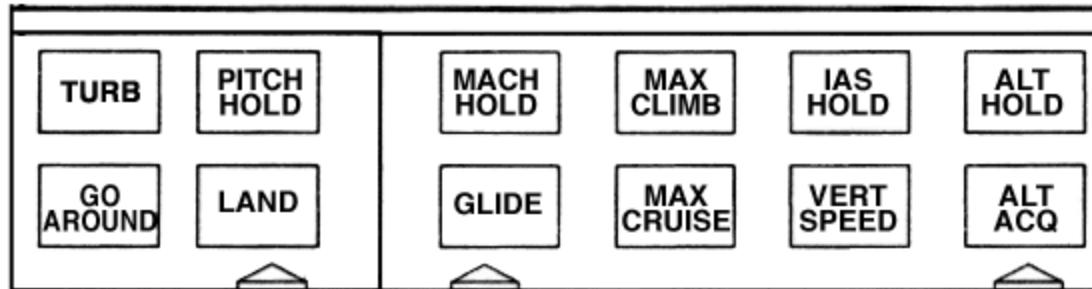
TRK HDG - track or heading. Aircraft either follows the compass direction or the final position, whichever selected by the pilot.

HDG HOLD - hold the current heading

VOR LOC - Causes the aircraft to turn and track the selected beacon

BACK BEAM - permits tracking of a back beam localiser.

AUTOPILOT VERTICAL MODES:



PITCH HOLD - hold the current pitch

MACH HOLD - hold the current Mach no by pitch changes only. Autothrottle, if enabled, holds precedence over this mode

MAX CLIMB - Takes the aircraft to the maximum operating speed. On reaching the target speed, mode disengages

MAX CRUISE - keeps the aircraft flying at Mach 2 after MAX CLIMB is reached, so that overheating is avoided.

IAS HOLD - hold the current airspeed by pitch changes

ALT HOLD - hold the current altitude

VERT SPEED - Set the vertical climb rate

ALT ACQ - Aircraft flies automatically to the target altitude

TURB - use only in extreme turbulence. holds the existing pitch, altitude and heading. reduces the trim rate to smoothen the ride

LAND - Auto land(touchdown only). another land autopilot is also enabled for redundancy

GO AROUND - Carried out when more than 2 of the throttle levers are pushed to full in LAND or GLIDE mode. Pitches the aircraft up at 15 degrees and holds the wings level till the next command

GLIDE - Used when pilot won't carry out an auto-landing and will go for manual landing