

BOEING 737-800

TECHNICAL REVIEW - CHAPTER 4

AUTO FLIGHT

OVERVIEW

AFDS = Autopilot + Flight Directors + Autothrottle

When CMD A is engaged, FCC A controls the flight directors and uses hydraulic system A to control the aircraft. The reverse is true with CMD B.

The flight directors will function independently in certain cases: Dual Channel approach, T/O or G/A below 400ft.

The autopilot will disengage when :

- Pressing the CMD switch or A/P disengage bar
- Activating the control wheel trim switch
- Stab trim autopilot cutout switch in the cutout position
- Left or Right IRS failure
- Interruption of electrical power in the related AC transfer bus
- Loss of hydraulic pressure in the related system

AFDS MODES

Autothrottle :	- N1	Roll modes :	- LNAV	Pitch modes :	- TO/GA
	- GA		- HDG SEL		- VNAV (PTH/SPD)
	- RETARD		- VOR/LOC		- V/S
	- MCP SPD				- ALT ACQ
	- FMC SPD				- ALT HOLD
	- THR HLD				- MCP SPD
	- ARM				- G/S
					- FLARE

LNAV engagement criteria in flight :

- Active route entered in the FMC
- within 3nm LNAV engages with any heading
- outside 3 nm LNAV the aircraft must be on a 90° intercept or less and it must occur prior to the next wpt

TO/GA during takeoff :

- Pressing TO/GA will command the autothrottle to the N1 set in the FMC and FD will show 10° nose down
- At 60kt FD shows 15° nose up
- At 84kt THR HLD is annunciated and the autothrottle servos are inhibited
- At liftoff the FD shows 15° nose up until sufficient climb is achieved then command pitch to maintain V2+20
- Below 400ft bank is limited to 8°
- At 800ft ARM is annunciated
- At thrust reduction altitude N1 is annunciated and thrust is reduced to the climb thrust set in the FMC
- At autopilot engagement TO/GA terminates and pitch mode reverts to MCP SPD

TO/GA Go-Around mode is available below 2000ft RA or above 2000ft RA with flaps not up or G/S capture.

DUAL CHANNEL APPROACH

Limitations: 2 autopilots, flaps 30°/40°, headwind below 25kt, crosswind below 20kt, tailwind below 10kt

Sequence:

- When cleared for approach engage CMD A and CMD B, SINGLE CH stays annunciated
- LOC capture occurs before half a dot
- G/S capture occurs at 2/5 of a dot, N1 thrust limit changes to G/A
- Below 1500ft RA:
 - The second autopilot couples with the flight controls and CMD is annunciated
 - A test of the ILS deviation monitor is made and G/S LOC flashes amber
 - FLARE is armed, Autopilot G/A is also armed but not shown
- 800ft RA is the lowest altitude at which the second autopilot must be engaged for an autoland
- At 400ft RA the stabilizer is automatically trimmed nose up to aid in case of a go around
- At 350ft RA if the FLARE is not armed the AP disengage
- At 50ft RA FLARE mode is engaged, FD retracts from view
- At 27ft Autothrottle RETARD is engaged and commands idle, then disconnects 2s after touchdown