















USE OF AUTOPILOT, FLIGHT DIRECTOR & FLIGHT MANAGEMENT SYSTEM

Course of: Aircraft Instrumentation & Integrated Systems

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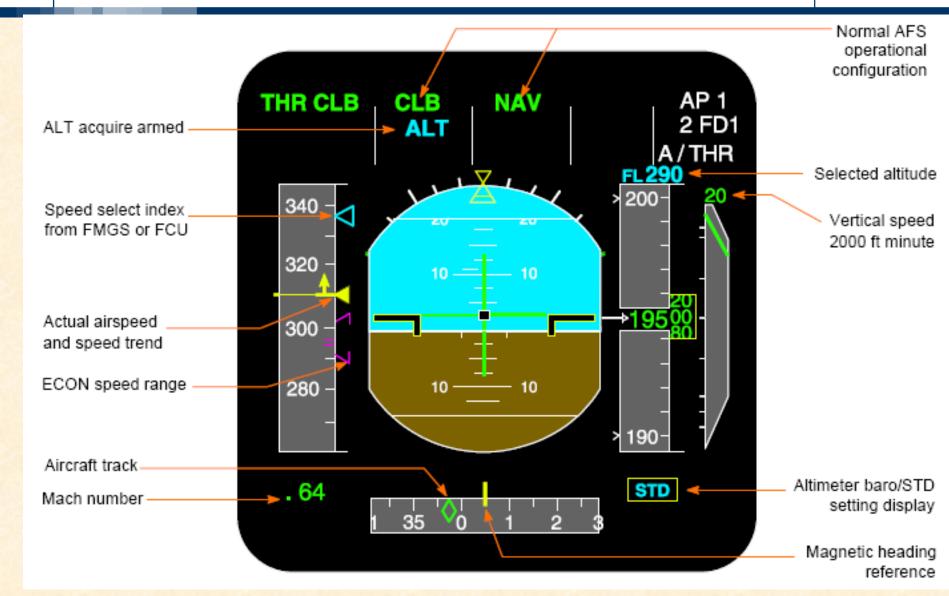
April 11th, 2022



PRIMARY FLIGHT DISPLAY (PFD)

CLIMB PHASE

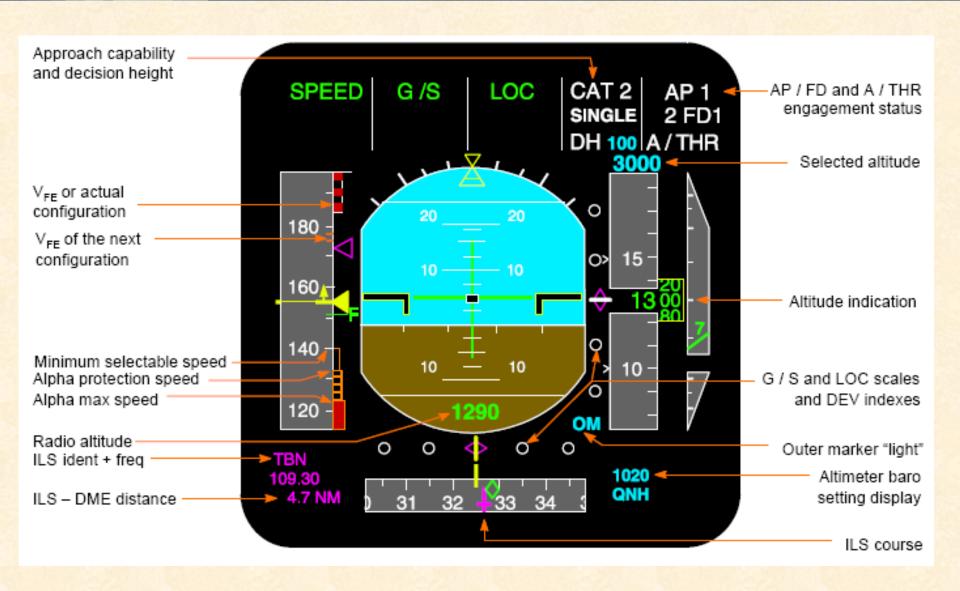






PRIMARY FLIGHT DISPLAY (PFD) ILS APPROACH PHASE

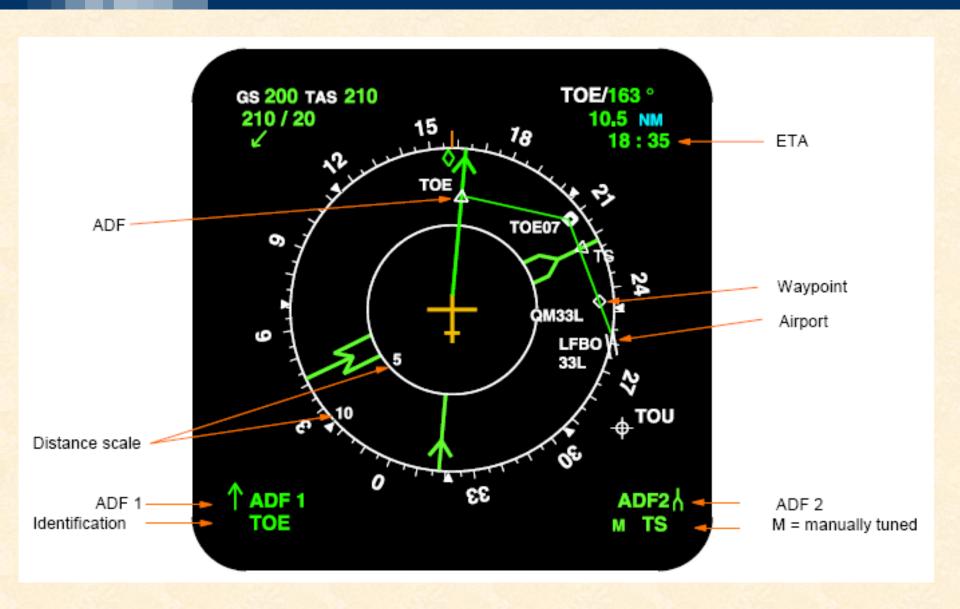






NAVIGATION DISPLAY (ND) ROSE NAV

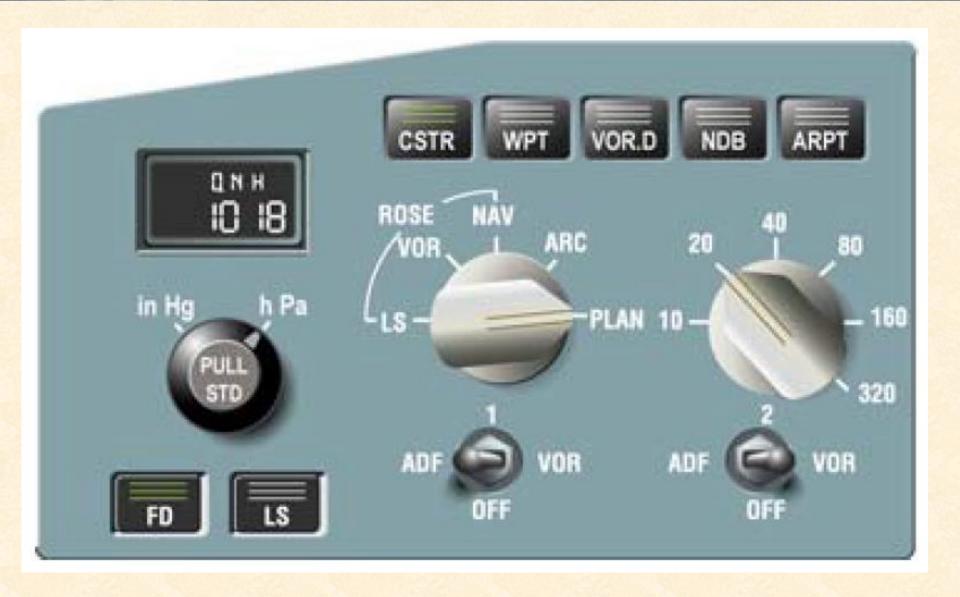






PFD & ND SELECTOR PANEL

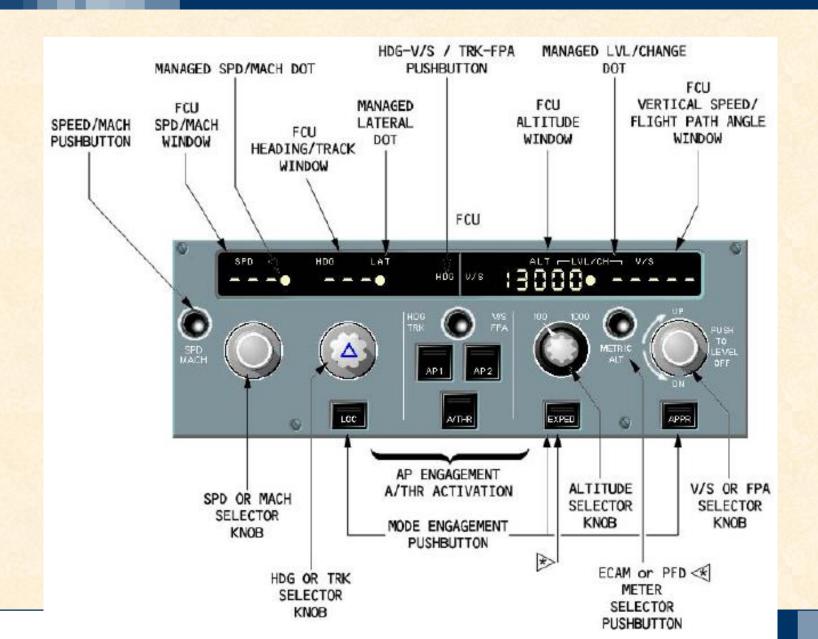






FLIGHT CONTROL UNIT (FCU) AUTOPILOT & FLIGHT DIRECTOR







FLIGHT MANAGEMENT & GUIDANCE SYSTEM LAYOUT



FMGS

Flight
Management
(navigation)

&

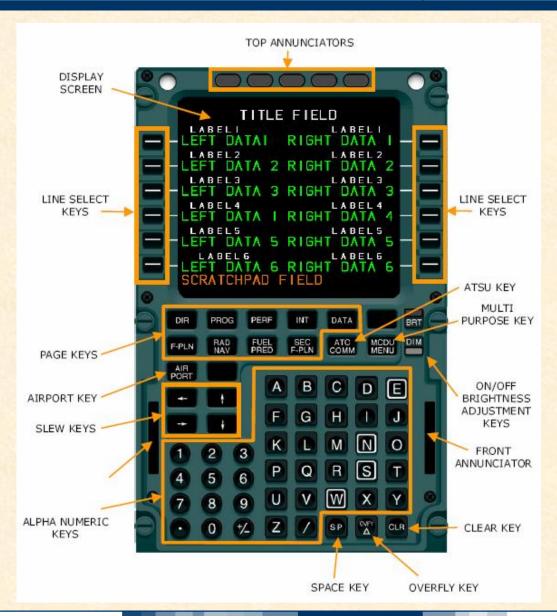
Guidance System (autopilot)

Reading of CFDS

(Centralized Fault Display System)

from MCDU

(Multifunction Control Display Unit)





FMGS PREPARATION SUGGESTED PATTERN











```
A320-211

ENG
CFM56-5-B4

ACTIVE NAV DATA BASE
21JAN-18FEB THV1040101
SECOND NAV DATA BASE

$24DEC-21JAN

CH6 CODE
[]
IDLE/PERF SOFTWARE
+0.0/+0.0 STATUS/XLOAD>
```

STATUS page

INIT1 page

COST INDEX: per minimizzare il costo dello specifico volo, il C.I. esprime il miglior compromesso tra costi operativi orari e consumo di carburante.

C.I. = 0 → Max Autonomia Chilometrica

Se C.I. >> → Velocità volo >>









```
INIT FUEL PREDICTION ↔
               ZFWCG/ ZFW
TAXI
                 28.0/ 58.0
0.2
                       BLOCK
TRIP TIME
                         7.8
  3.2/0122
RTE RSV/%
  0.2/5.0
ALTN/TIME
                         TOW
  1.8/0042
                        65.6
FINAL/TIME
                          \mathsf{L}\,\mathsf{M}
  1.0/0030
                        62.4
EXTRA/TIME
  1.4/0038
```

INIT2 page

FLIGHT PLAN

```
FROM
                 THV001 ←>
                SPD/ALT
 FIST5A
         TIME
                        490
H144°
         BR6144*
900
         0000
                153/
                        900
 C144°
         TRK144*
D144H→
         0002
                      *3130
 C356°
TOU
         0005
                250/
                       FL85
                     3 N M
 (SPD)
         0005
               #250/ FL100
DEST
          UTC
                DIST
                       EFOB
EGLL27R
         0122
                 532
```







```
TAKE OFF
     FLP RETR
                      RWY
141
       F=150
                      14R
     SLT RETR
                TO SHIFT
141
       S=192
 ٧2
         CLEAN
                FLAPS/THS
143
       0=216
                  2/UP0.6
TRANS ALT
            DRT TO-FLX TO
5000
THR RED/ACC
              ENG OUT ACC
 1990/3490
                      1990
 UPLINK
                     NEXT
<TO DATA
                    PHASE>
```

PERFORMANCE page

FUEL prediction page

```
FUEL PRED

AT UTC EFOB

EGLL 1622 4.4

EHAM 1705 2.6

GW /CG FOB

----/----

RTE RSV/% CRZTEMP/TROPO
----/----
FINAL/TIME
----/----
EXTRA/TIME
```

MCDU PAGES





```
RADIO NAV

VOR1/FREQ FREQ/VOR2

TOU/117.70 117.70/TOU

CRS CRS

144 []

ILS /FREQ CHAN/ MLS

TBS/110.70 []/[]

CRS SLOPE CRS

F144 -.- []

ADF1/FREQ FREQ/ADF2
[]/[]
```

RADIO NAV

OPT ALT. Consente di ottenere la max autonomia chilometrica, assegnati:

- Peso velivolo
- Cost Index

PROGRESS

MAX ALT. E' la minore delle due quote di tangenza (con un margine su entrambe):

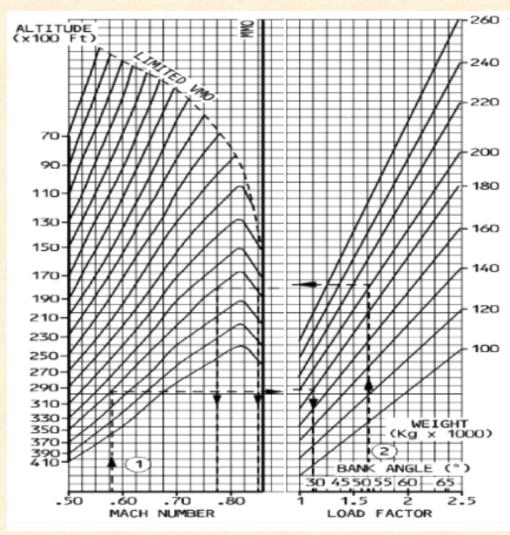
- Aerodinamica (buffet onset)
- Propulsiva (Potenze Nec. e Disp.)

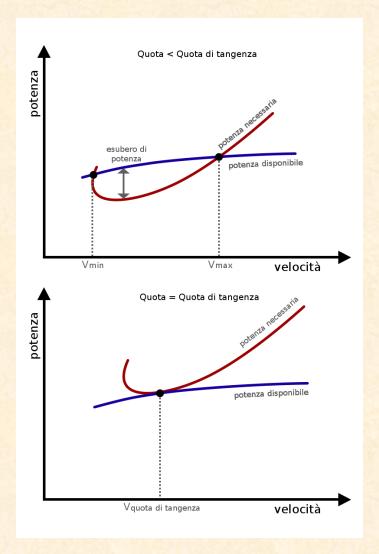
```
IUAMAT
         OPT
FL370
 CRZ
                  REC MAX
FL360
                   FL383
<REPORT
 UPDATE AT
  BRG /DIST
               TO LFB014R
 301 1.1
 PREDICTIVE
<GPS
              GPS PRIMARY
REQUIRED ACCUR ESTIMATED
          HIGH
1.00NM
                    0.08NM
```



AERODYNAMIC and PROPULSION CEILING







FCOM A330 - Airbus

https://it.wikipedia.org/wiki/Quota_di_tangenza#/media/File:Tangenza_potenza_vs_velocit%C3%A0.png



STEP CLIMB STRATEGY



