

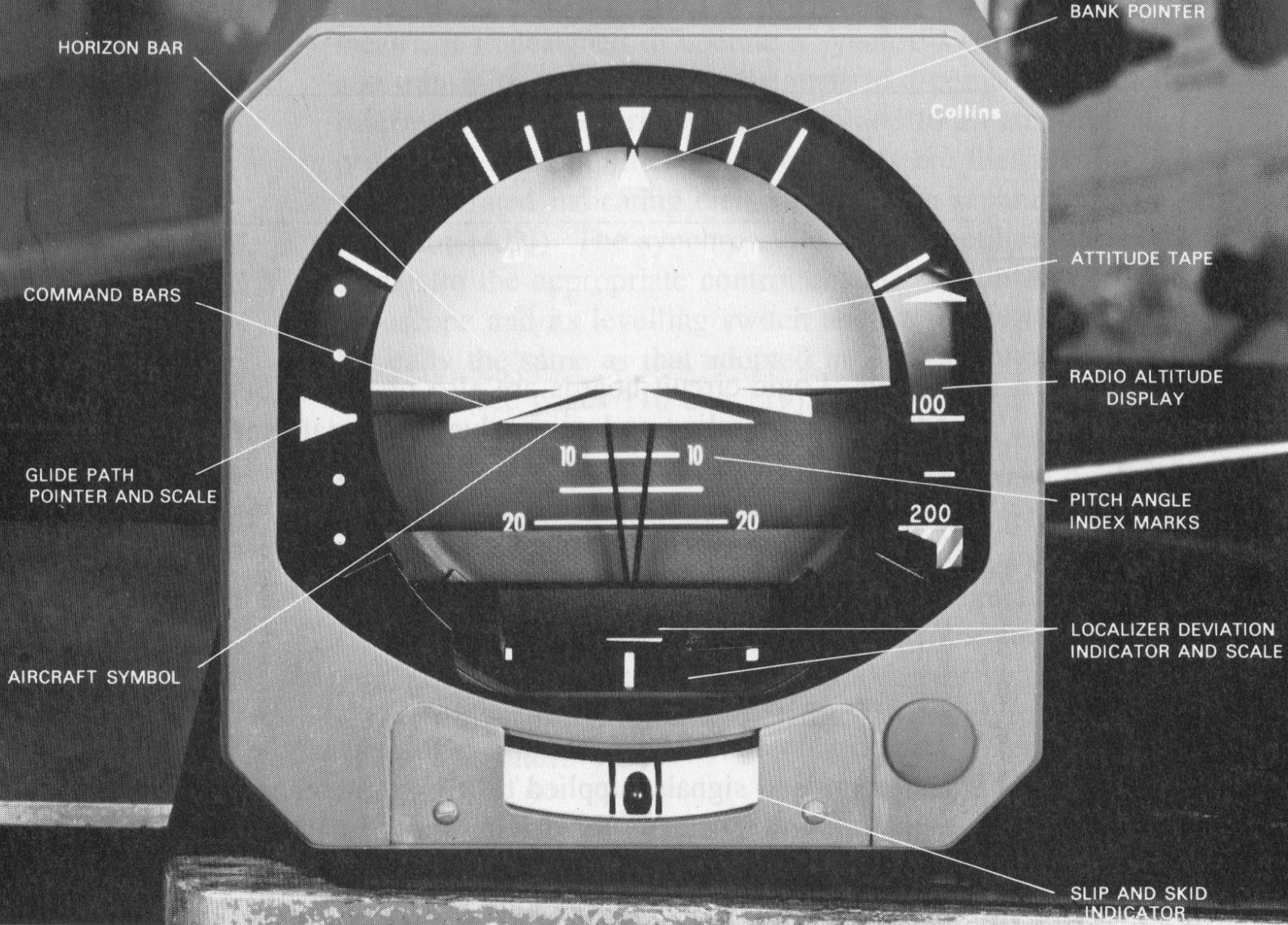
Flight Director

Componenti del Flight Director Computer (FDC)

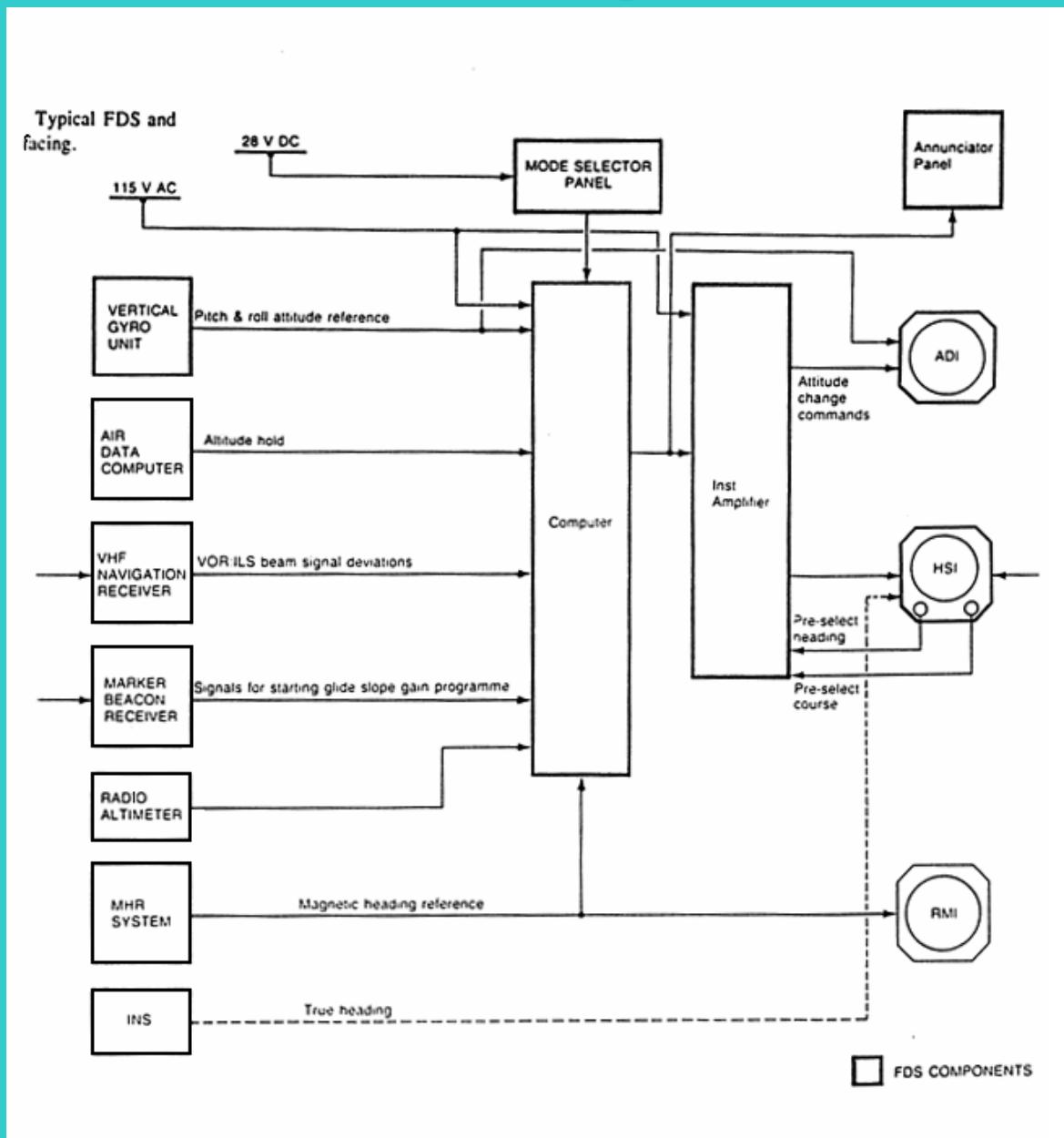
- Mode Selector Panel
- Instrument Amplifier
- Annunciator Panel
- Attitude Display Indicator (ADI)
- Horizontal Situation Indicator (HSI)

Dati che arrivano al Flight Director Computer

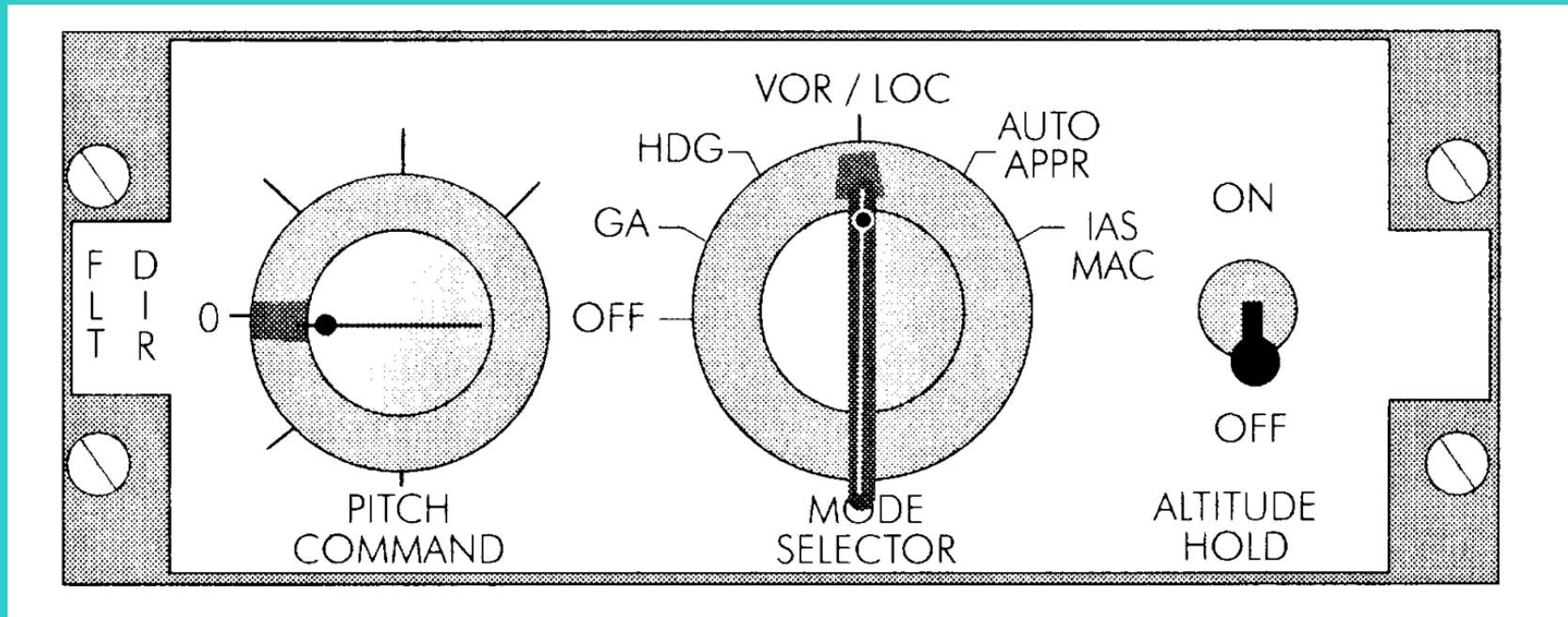
- Attitude Information
- Heading Information
- Air Data Information
- Navigation Aid Receiver
VOR - ILS Loc- ILS GS – Marker Beacon –
DME – Radioaltimeter – GNSS - etc...



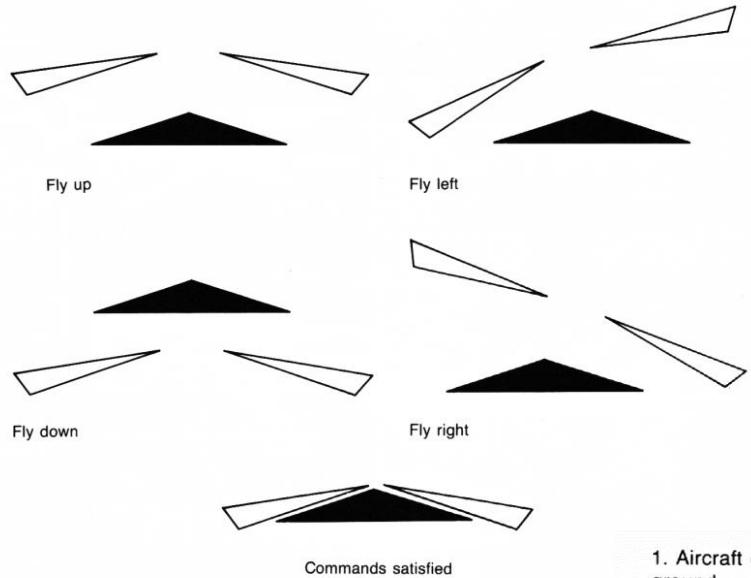
Schema del Flight Director



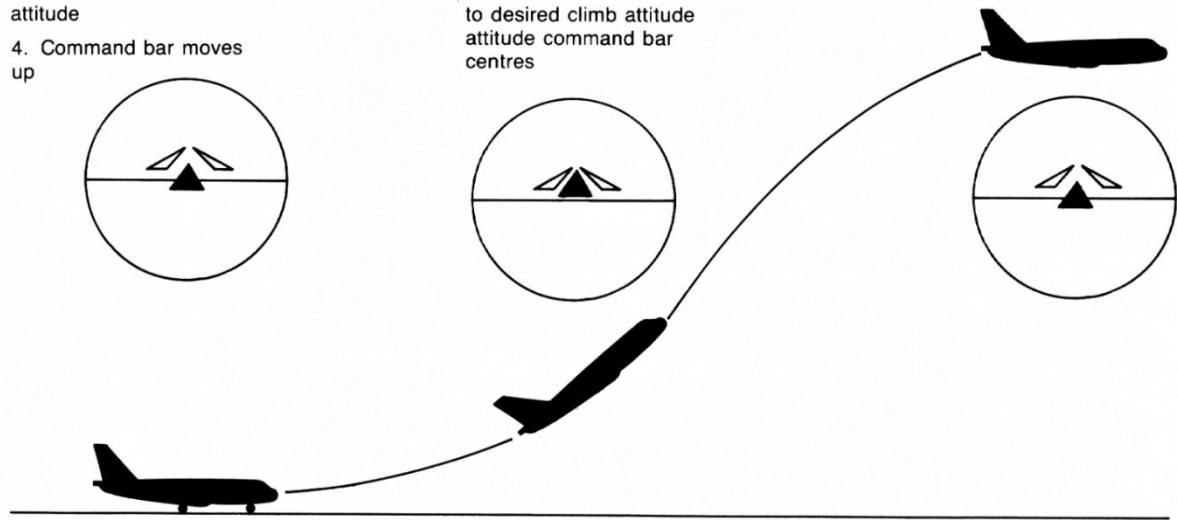
Flight Director

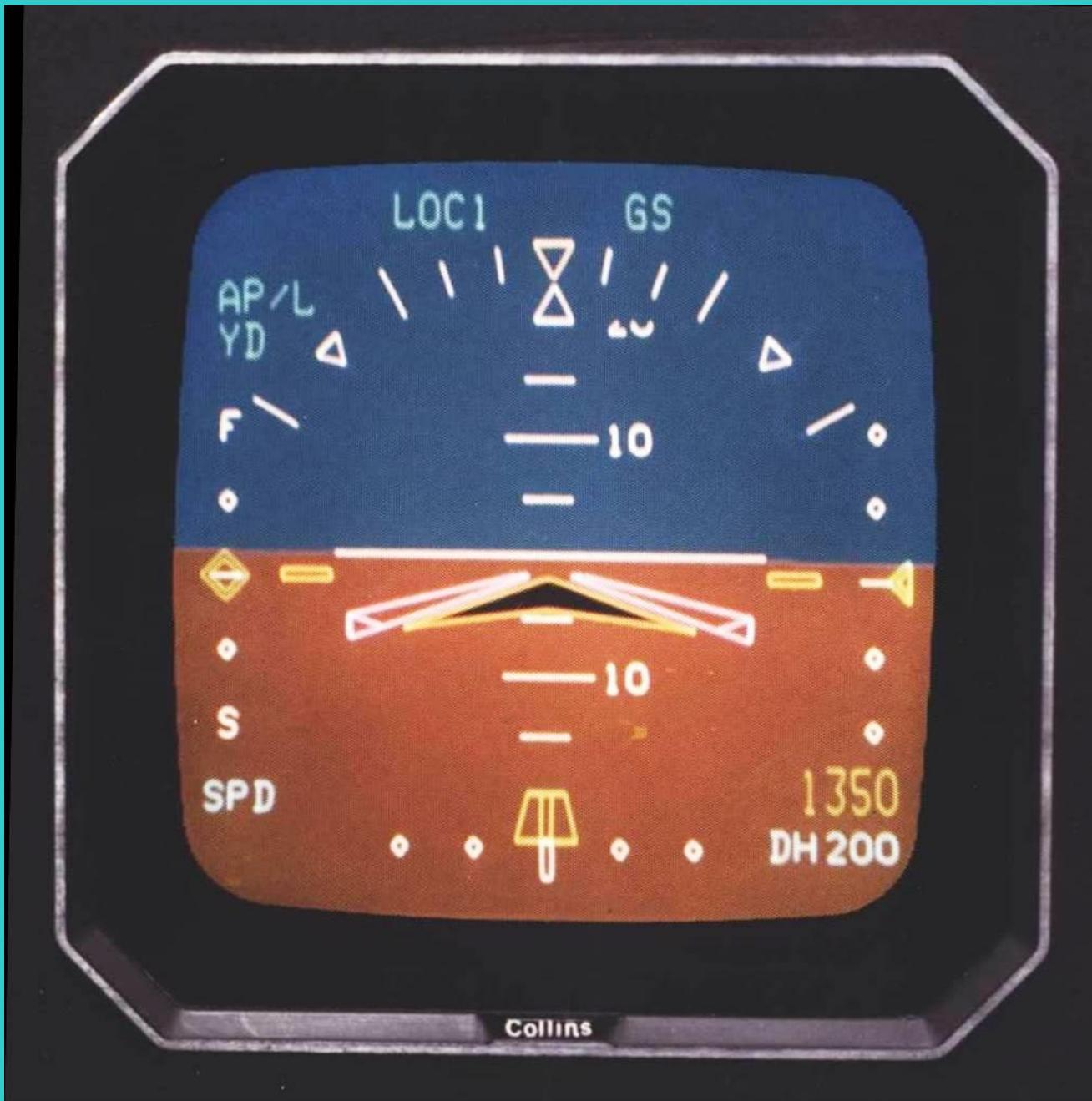


Mode Selector Panel o Mode Control Panel o Unit



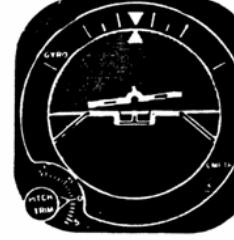
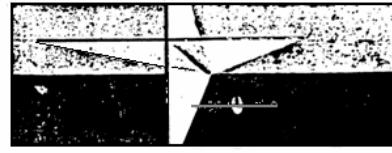
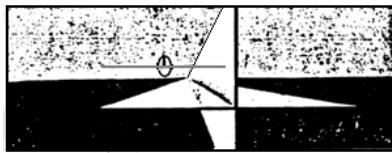
1. Aircraft on the ground
2. F/D mode selector to HDG mode (typical outbound heading)
3. Pitch command knob to desired climb attitude
4. Command bar moves up
5. When aircraft rotates to desired climb attitude attitude command bar centres
6. After aircraft gets to desired altitude and levels, bar deflects up. Recentre by turning pitch command knob until bar centred on fixed airplane reference.







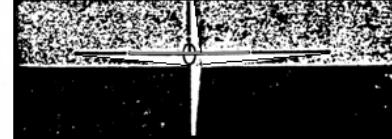
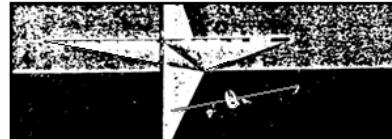
Takeoff using Go-Around mode



Command: Fly right and down.
Situation: Aircraft left of course, within localizer beam, above glideslope which is engaged.



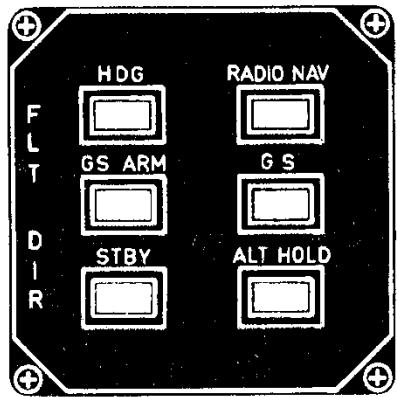
Command: Fly left and up.
Situation: Aircraft to right of course, within localizer beam, below glideslope, which is engaged.



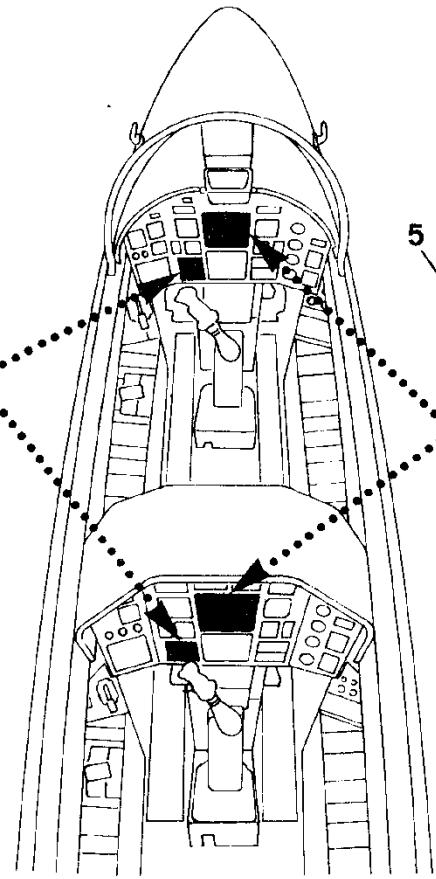
Command Satisfied: Aircraft in left bank, nose up.
Situation: Aircraft entering centerline of localizer and glideslope beams.



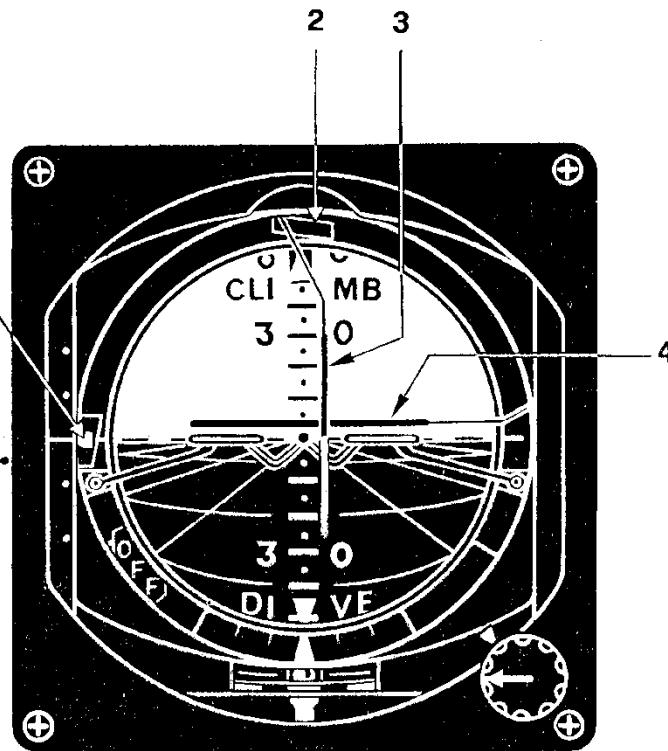
All Commands Satisfied: Aircraft in wings level, nose down attitude at proper rate of descent.
Situation: Aircraft flying on centerline of localizer and glideslope beams.



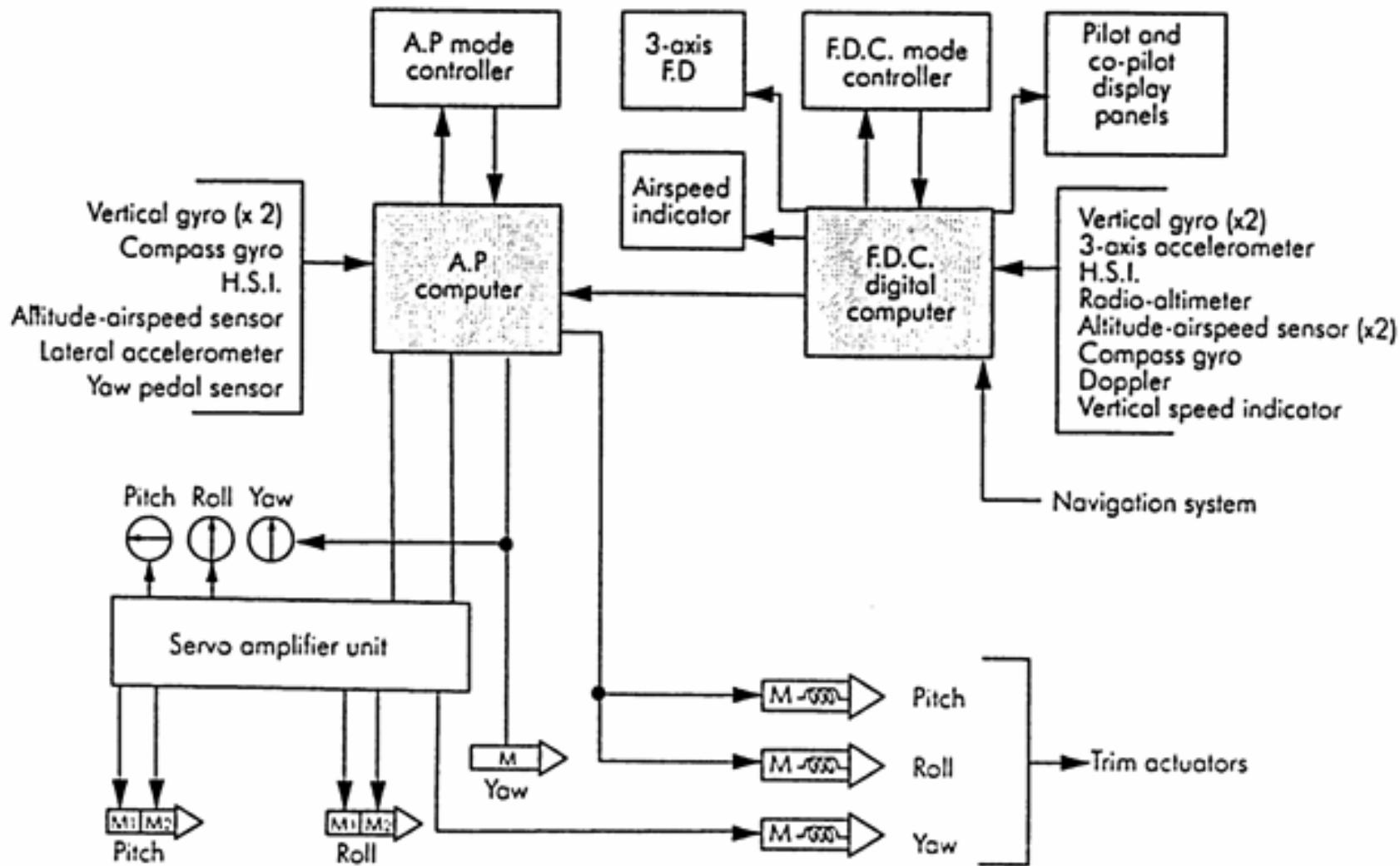
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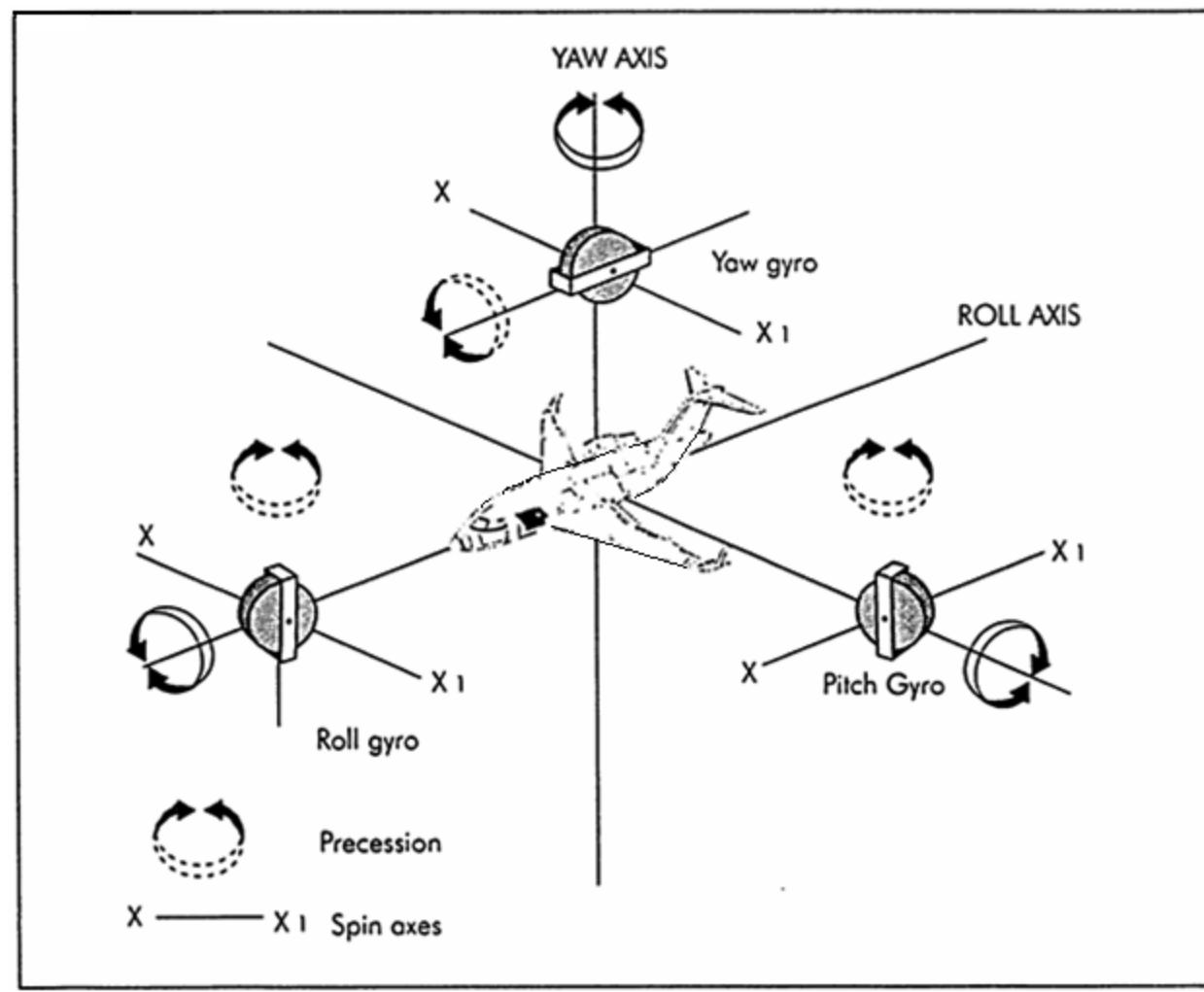


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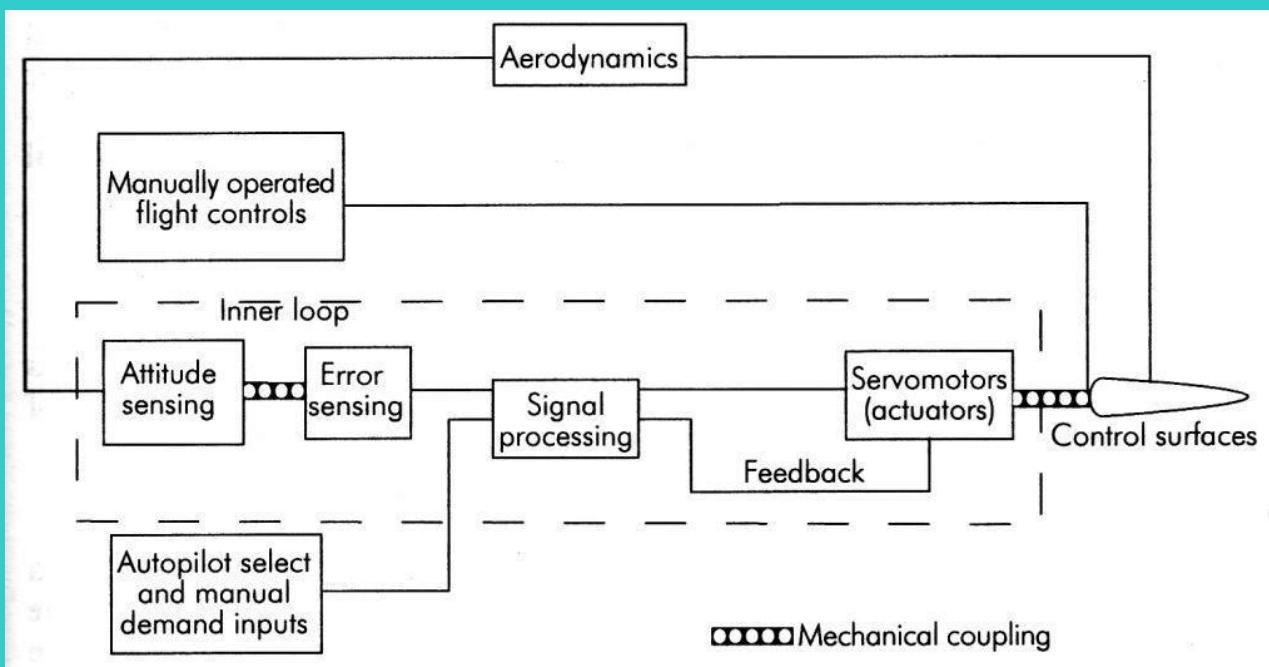
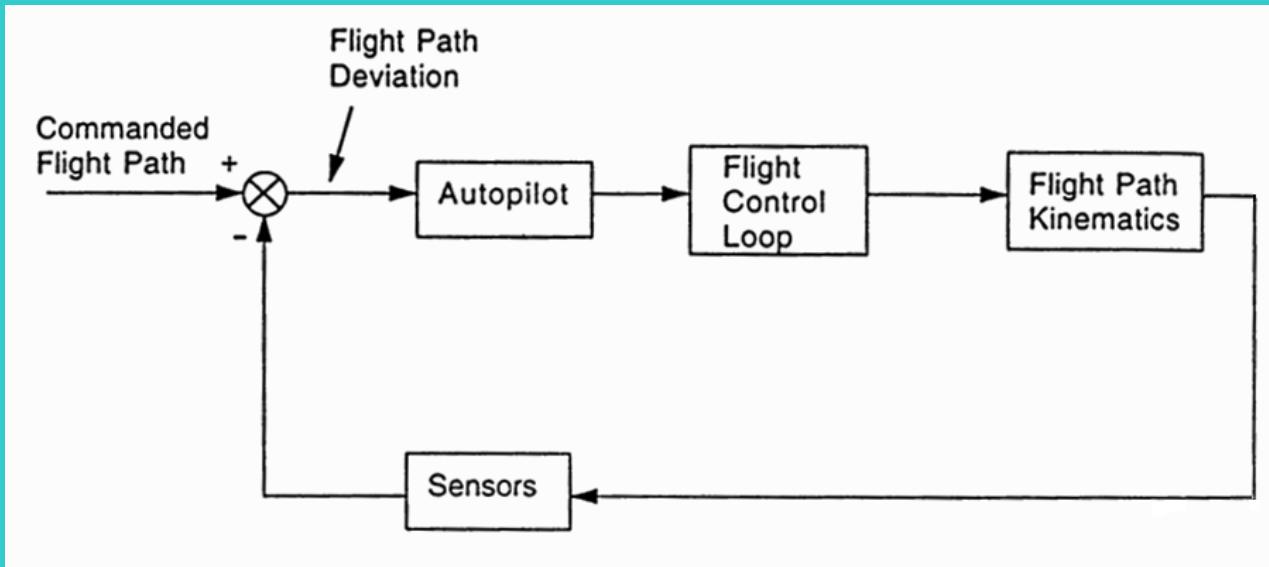


Flight Director & Autopilot





Autopilot loop



L'impiego di sistemi automatici permette una precisione e una prontezza di risposta nella manovra superiori a quelle che un pilota medio può fornire.

Si stima ad esempio che un pilota possa apprezzare un cambiamento d'assetto di 1° e reagire in 0.8 secondi. Un autopilota può invece apprezzare uno scostamento di 0.01° e applicare il controllo necessario in 0.16 secondi.

FMS Flight Management System

L'introduzione del Flight Management System **FMS** nasce dalla necessità di:

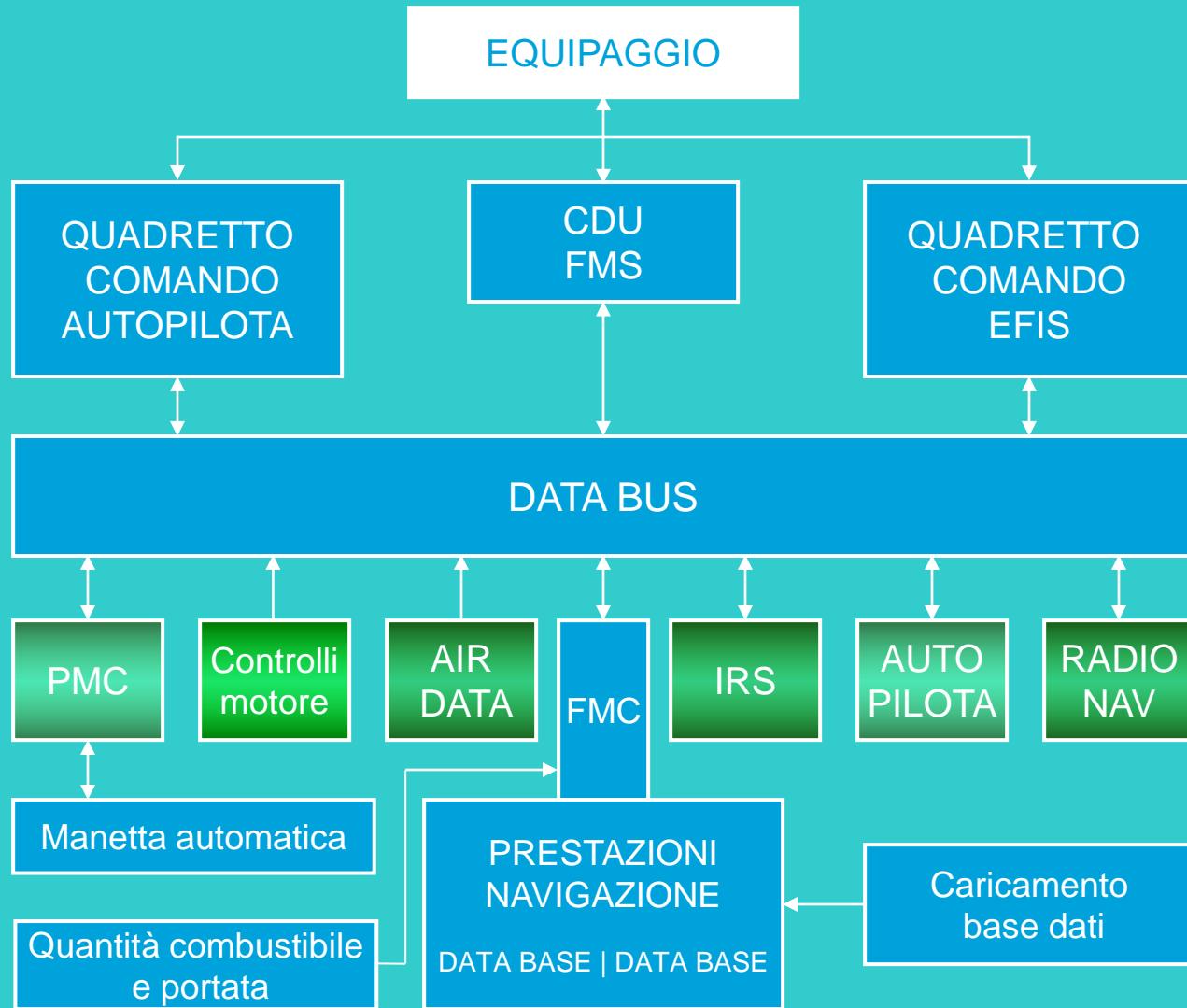
- Ottimizzare i costi
- Interfacciarsi con il crescente traffico aereo
- Gestire i sistemi di navigazione accurata presenti a bordo

Il raggiungimento di questi obiettivi è possibile tramite la presenza a bordo di potenza di calcolo e l'adozione di Data Bus.

In generale quindi il compito dell'FMS è quello di assistere il pilota nel condurre il volo in maniera ottima, automatizzando quanti più compiti in relazione alla missione per ridurre il carico di lavoro del pilota.

Compiti del Flight Management System

- a) Sovrintendere allo sviluppo del volo assicurando la percorrenza della traiettoria prevista sia come rotta che come profilo di quote.
- b) Assicurare il mantenimento delle velocità ottimali durante le varie fasi di volo, mantenendo un adeguato margine rispetto alle velocità minime e massime previste nell'inviluppo di volo dell'aeroplano.
- c) Controllare automaticamente la spinta fornita dai motori in rapporto con la velocità.

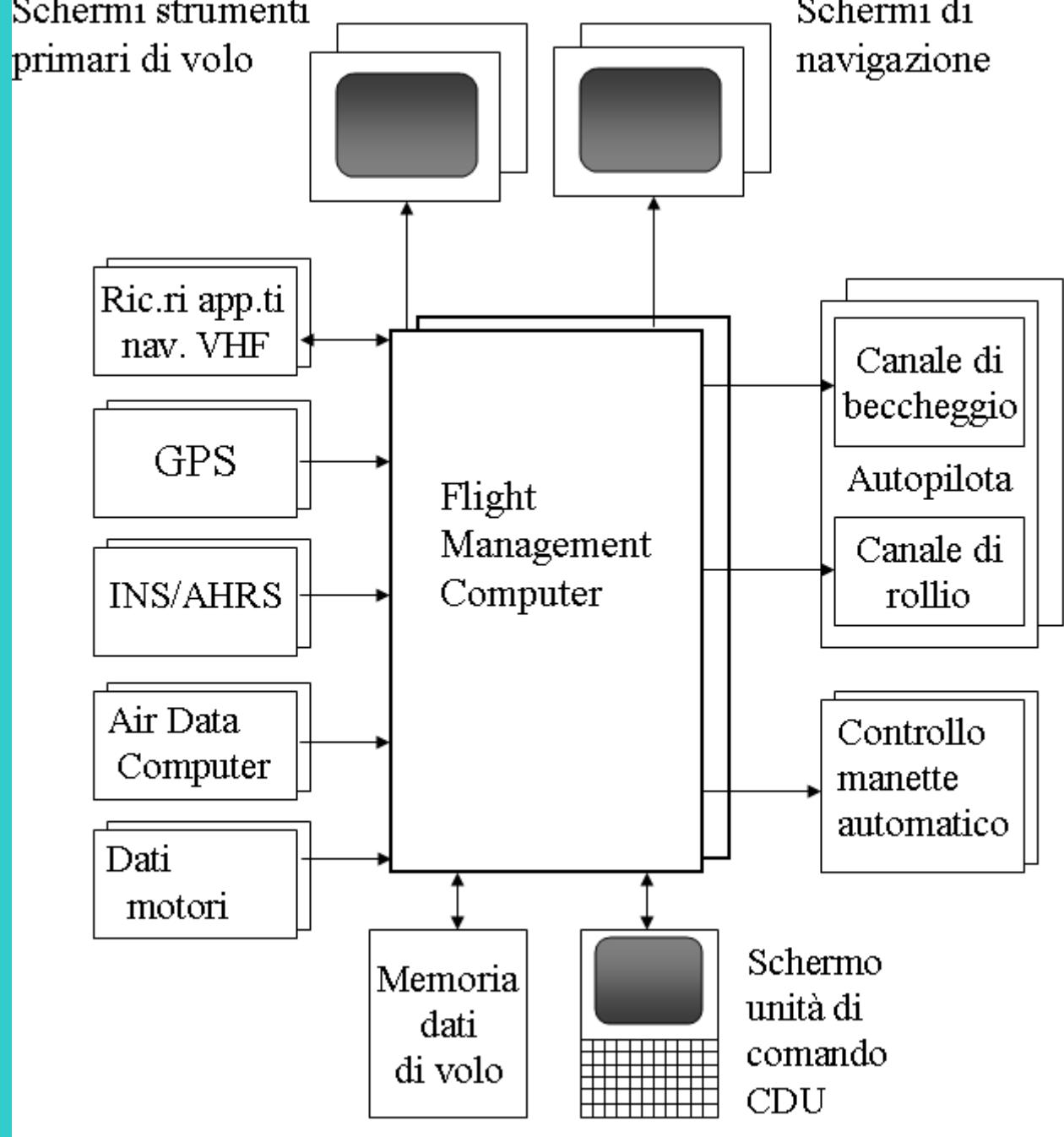


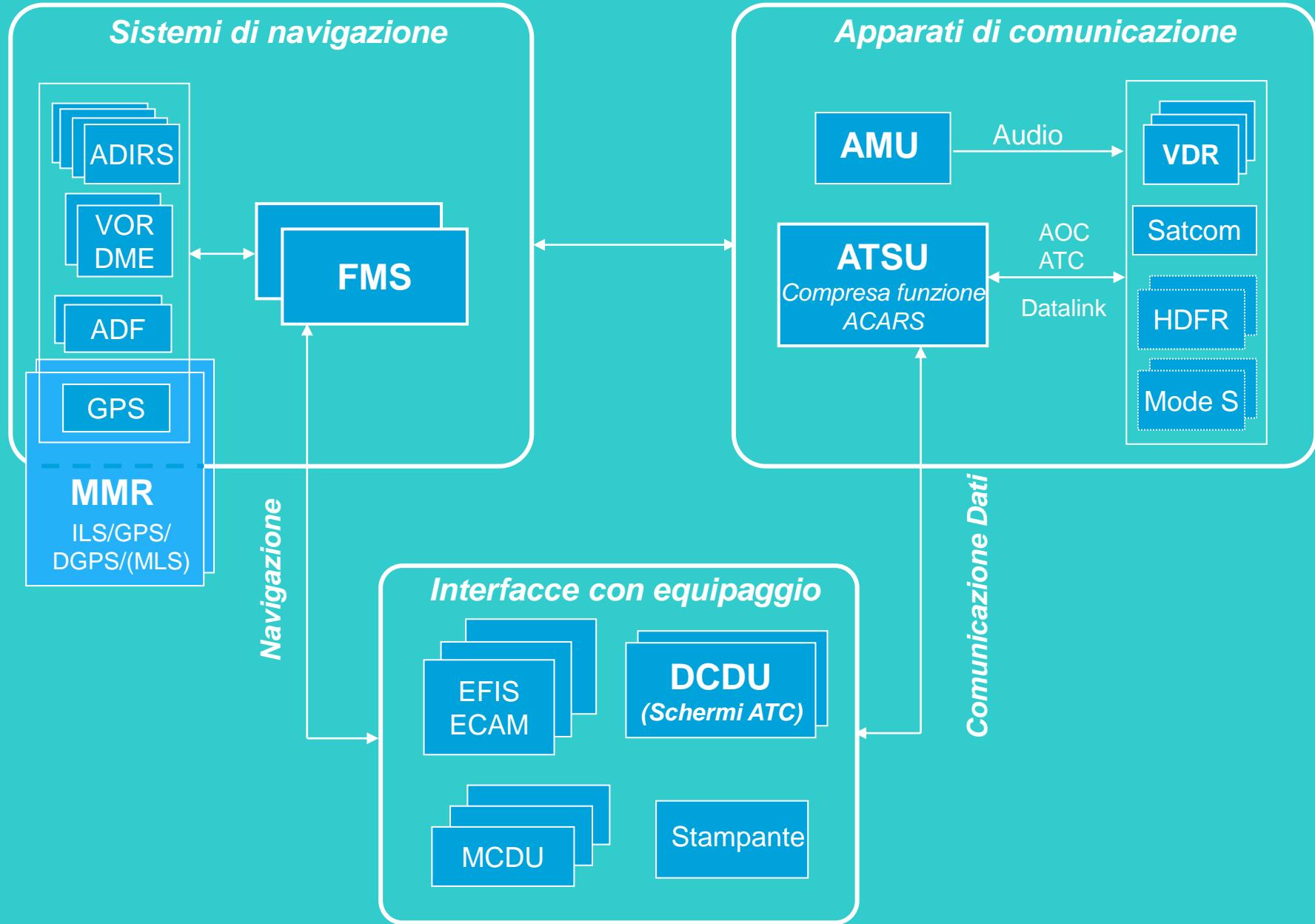
Airbus A380

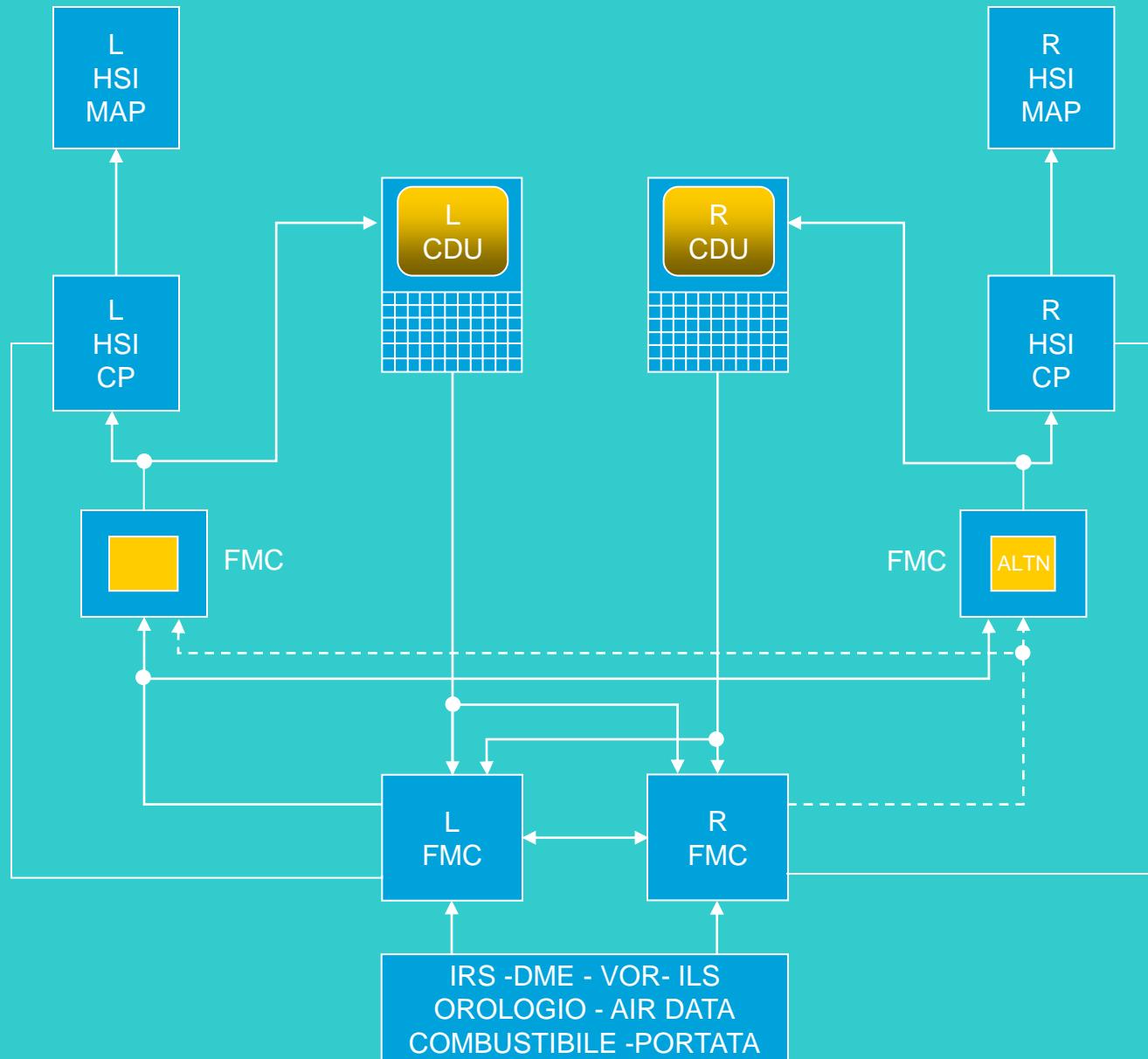


Schermi strumenti
primari di volo

Schermi di
navigazione







Funzioni del Flight Management System

AI FMS competono quindi le funzioni relative alla:

- Navigazione automatica anche in 4D
- Presentazione delle informazioni
- Gestione dei sistemi di bordo
- Gestione efficiente del combustibile

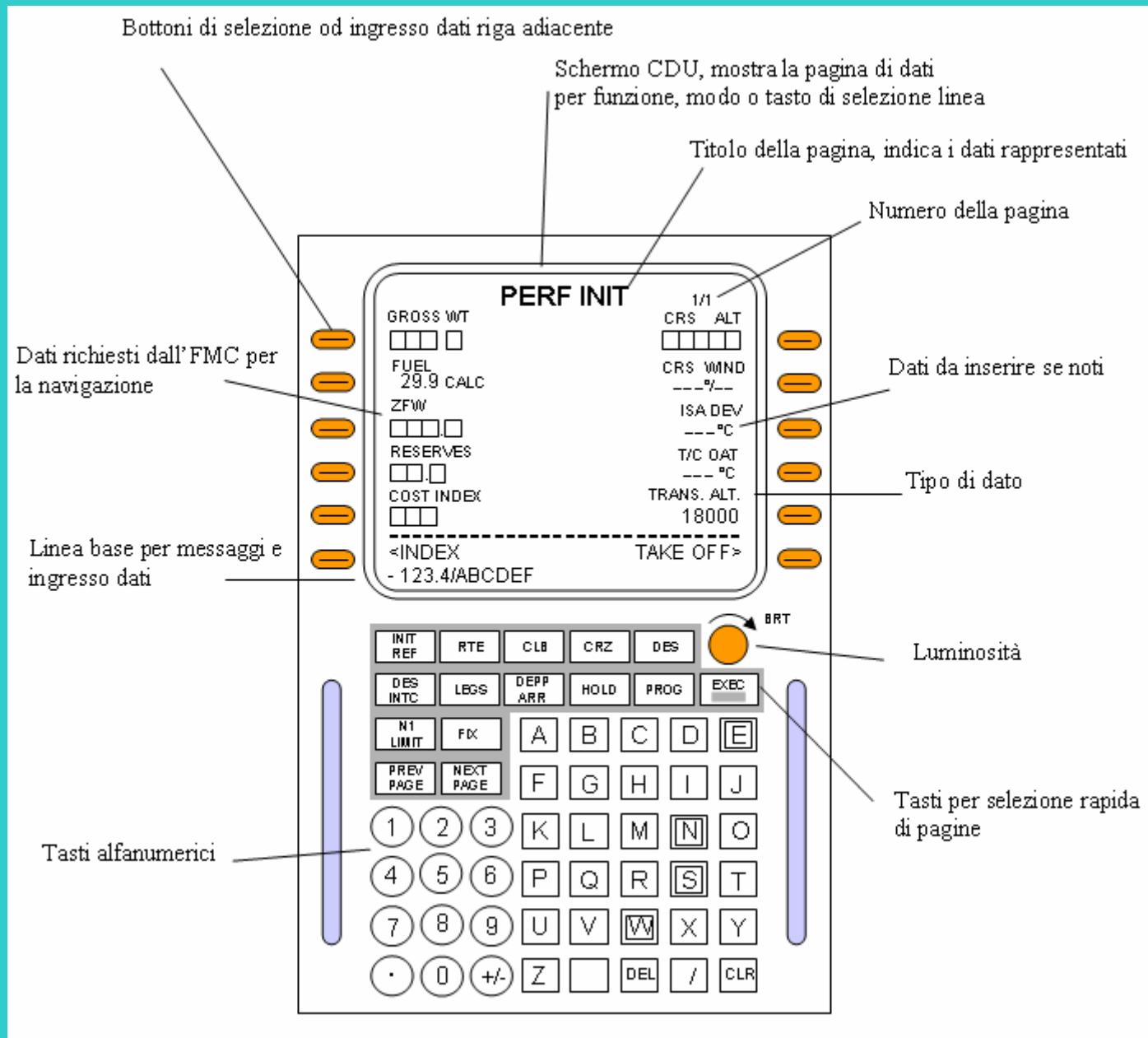
per ottenere una:

- Riduzione dei costi operativi
- Salvaguardia della sicurezza

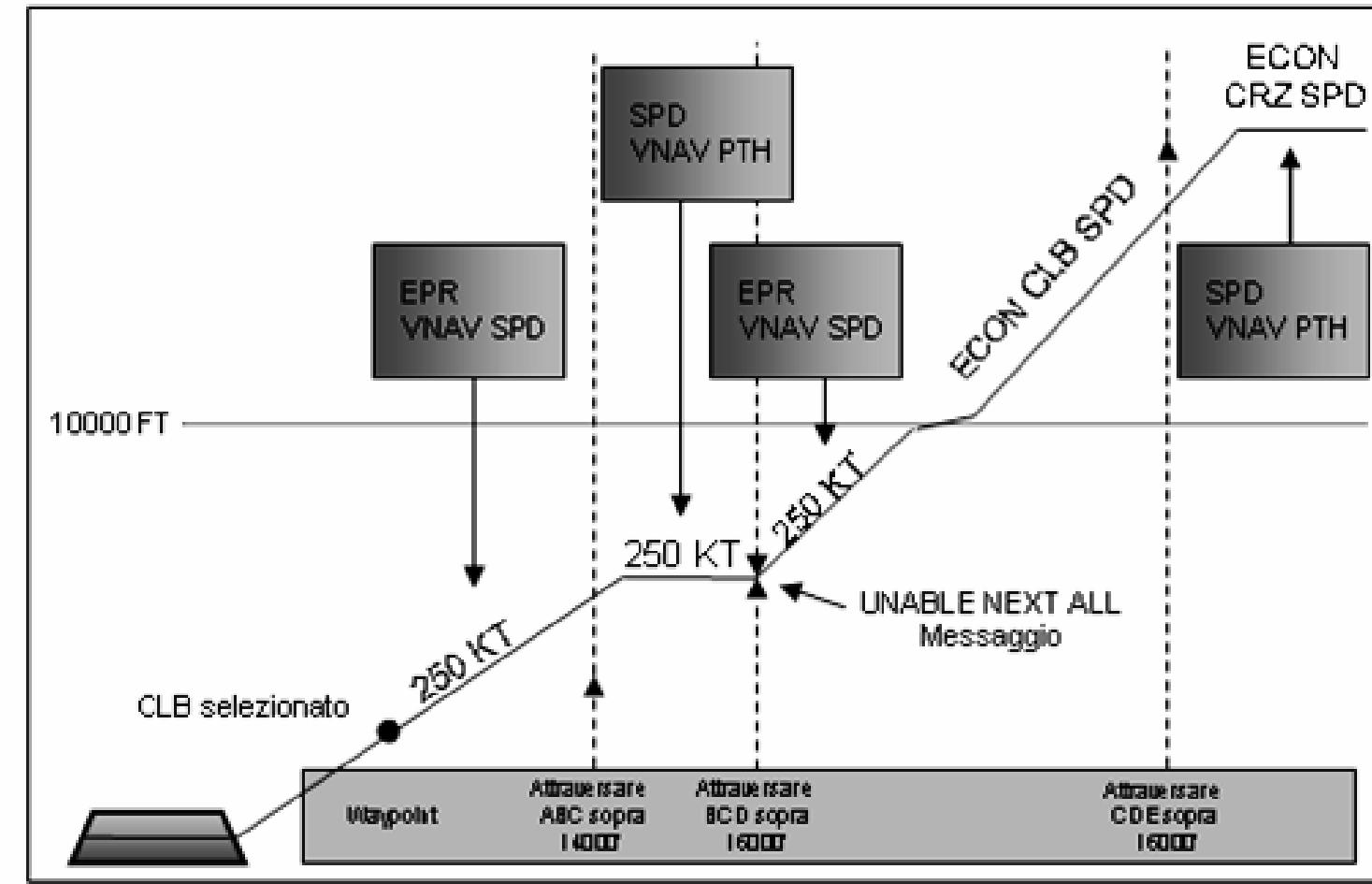
CDU Control Display Unit



CDU Control Display Unit







VNAV = VERTICAL NAVIGATION
EPR = ENGINE PRESSURE RATIO

