



# TECHSAVIATION *Training Center*

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# Display Crew Alerting System

## Display Crew Alerting System

### Features

The Display Crew Alerting System (DCAS) provides the crew with visual, audio, and tactile indications necessary for the operation of the airplane.

The DCAS is made up of the Primary Display System (PDS) and the Crew Alerting System (CAS).

The PDS has five Head-Down Displays (HDD) and two Head-Up Displays (HUD).

The two inboard displays and the lower center display are designated as Multi-Function Displays (MFD).

The PDS shows this information:

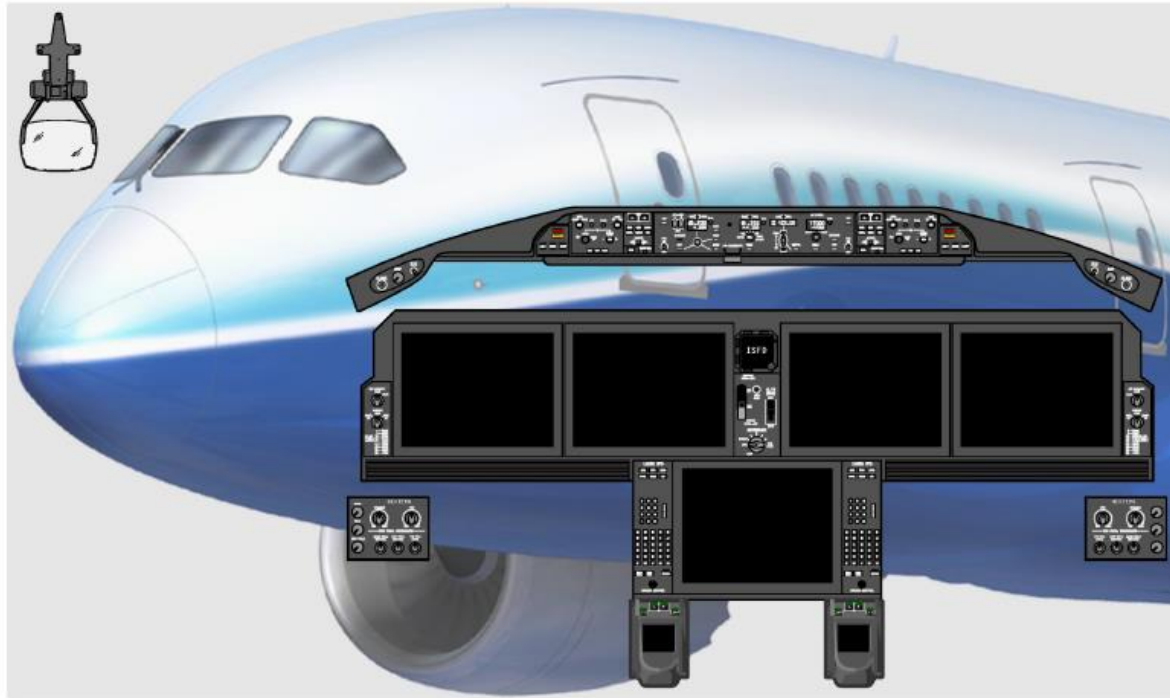
- Air data
- Inertial reference data
- Navigation data
- Engine data
- Airplane system data
- Communication data
- Checklist data.

### Crew Alerting System

The crew alerting system alerts the flight crew to non-normal conditions.

It provides visual, audio, and tactile alerts for:

- Stall warning
- Crew alerting
- Configuration warnings
- Altitude alert.

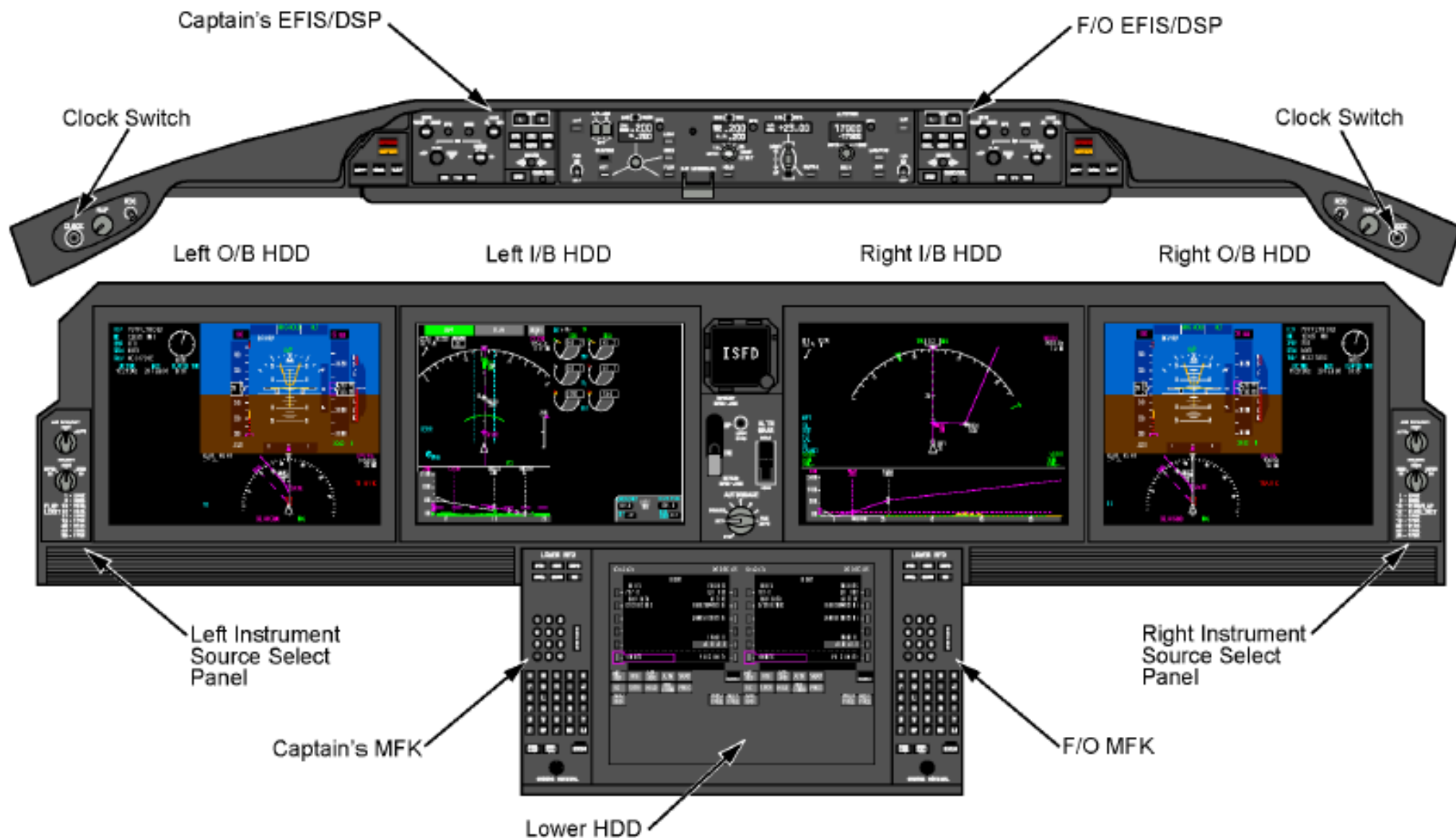


## Main Instrument Panels

The main instrument panels have these components:

- Five Head-Down Displays (HDD)
- Two Electronic Flight Instrument System/Display Select Panels (EFIS/DSP)
- Two Instrument Source Select Panels (ISSP)
- Two Multifunction Keypads (MFK)
- Two clock switches.

The normal power-up displays are shown in the graphic above.



## Primary Flight Display

The two outboard head-down displays normally show the Primary Flight Display (PFD) and the Auxiliary (AUX) displays.

The PFD is shown in the top of the display with a mini map display in the lower section.

The PFD shows this data:

- Attitude
- Airspeed
- Barometric altitude
- Vertical speed
- Radio altitude
- Flight mode annunciations
- Autopilot status
- Traffic Alert and Collision Avoidance System (TCAS) resolution advisories
- Lateral and vertical deviation
- Time Critical Warnings (TCW).

The mini map shows a Navigation Display (ND) with a 20-nm range.

This data shows on the mini map:

- Heading and compass rose
- Selected heading
- Active flight plan
- TCAS alerts
- Speed.

The AUX displays show this data:

- Flight number
- Tuned communication frequency
- ATC transponder code
- SELCAL identifier
- Airplane tail number
- Time and date.



NOTE: Captain's side shown, F/O's similar.



## EICAS Display

The Engine Indication and Crew Alerting System (EICAS) is normally displayed on an inboard Multi-Function Display (MFD).

EICAS shows engine and other system parameters and crew alerting messages.

The crew alert messages show in one of these categories:

- Warnings
- Cautions
- Advisories
- Communications
- Memos.

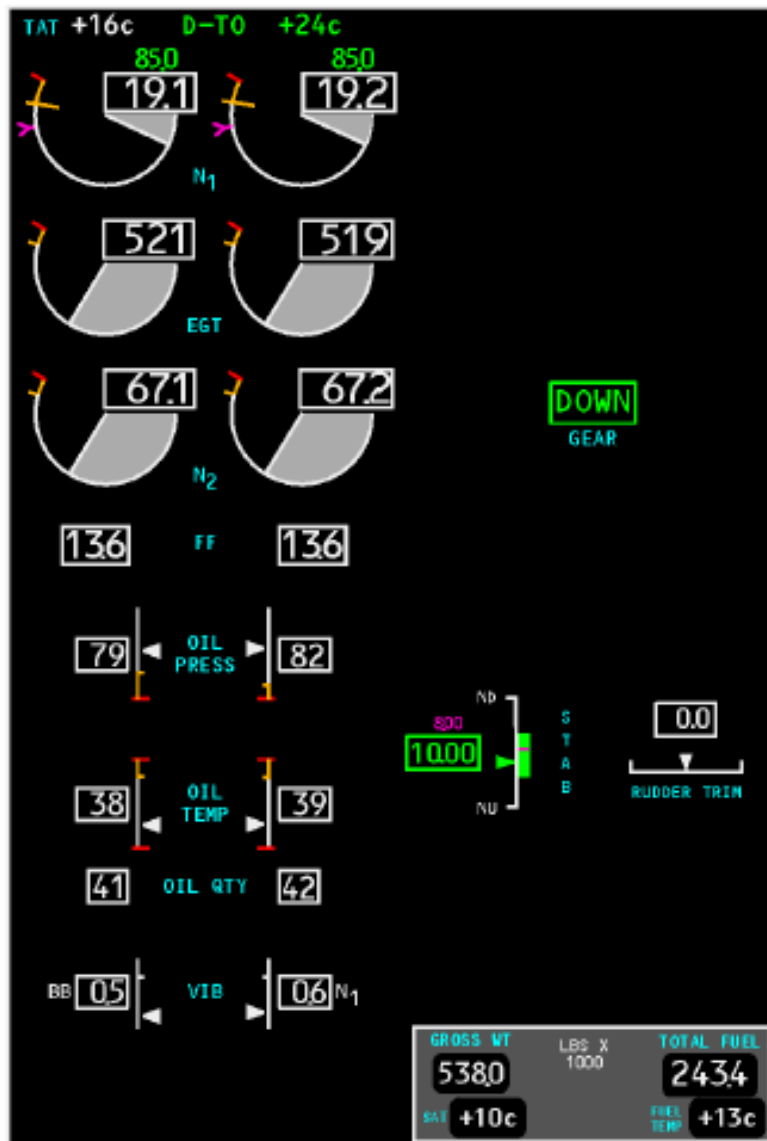
Warnings are red and are shown at the top of the message field. Warnings require immediate crew action. They have an aural that can be a bell, siren, or voice.

Cautions are amber and are shown below the warning messages. Cautions require immediate crew awareness. The caution aural is a beeper sound.

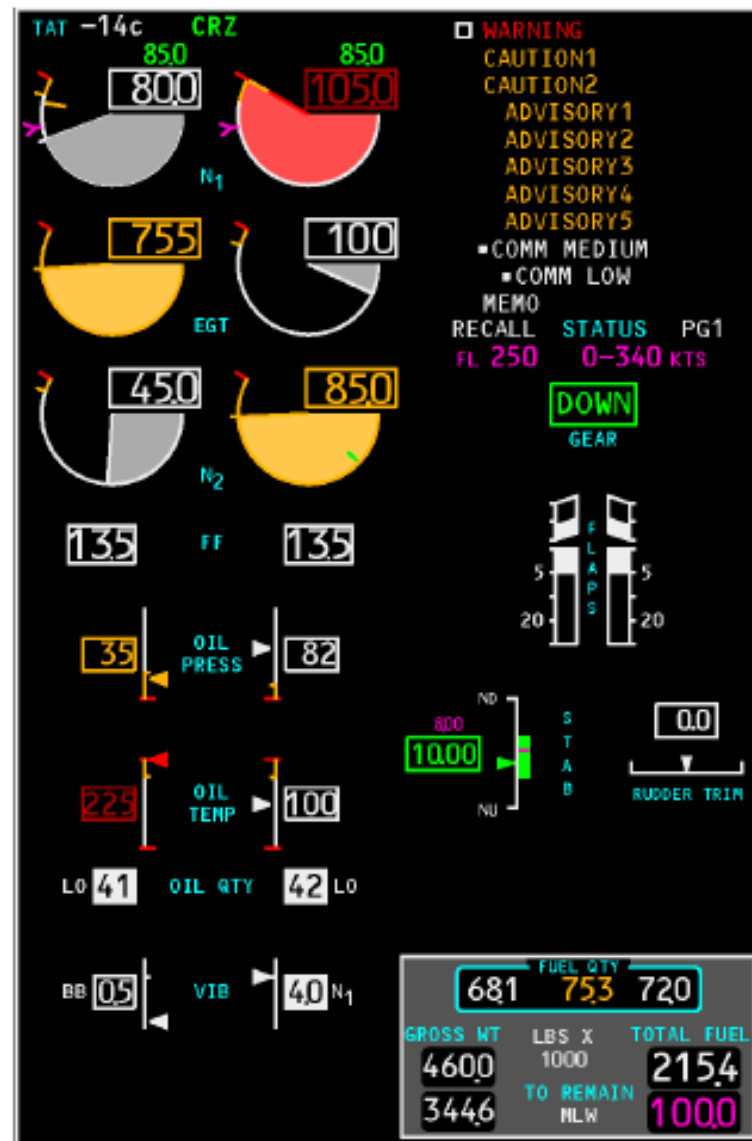
Advisories are amber and are shown indented to the right below the caution messages. Advisories require crew awareness. There are no aural associated with advisory messages.

Communications messages are white and show below advisory messages. They require crew awareness. The aural for communication messages are high/low chimes.

Memo messages are also white and show below the communications messages. They are reminders for the crew. There are no aural associated with advisory messages.



Normal Display



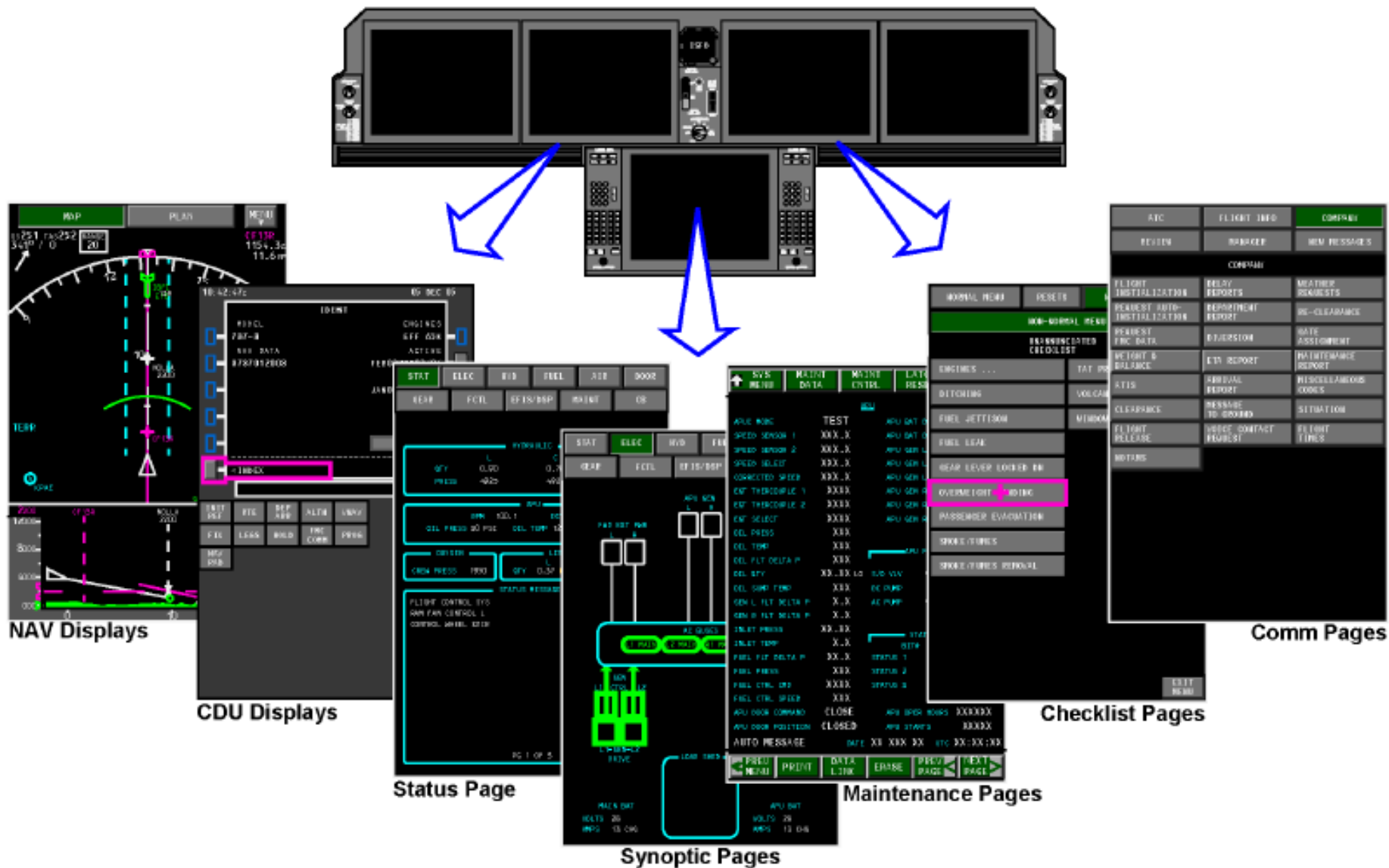
Non-normal Display

## Multi-Function Displays

The Multi-Function Displays (MFD) show auxiliary information that can be used by both the flight crew and maintenance personnel.

These are the types of displays:

- Navigation displays
- Status pages
- Control Display Unit (CDU) displays
- Synoptic pages
- Maintenance pages
- Checklist pages
- Communication pages

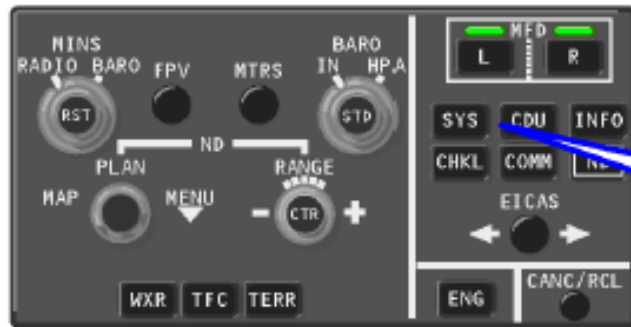


## Status Page

The status page shows information that assists maintenance personnel to determine the dispatch status of the airplane.

The display can show a maximum of 13 status messages on one page.

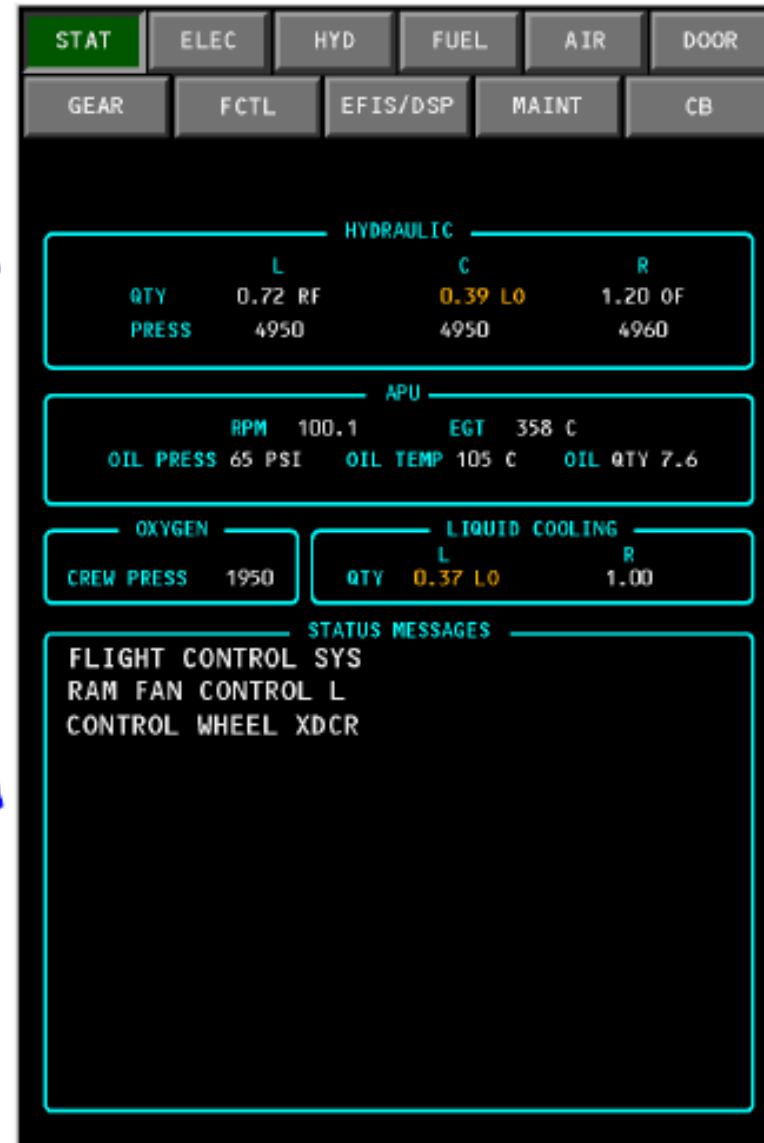
- The status page shows:
- Hydraulic system information
- APU information
- Crew oxygen information
- Liquid cooling system information
- Status messages.



EFIS/DSP



MFK



## Synoptic Pages

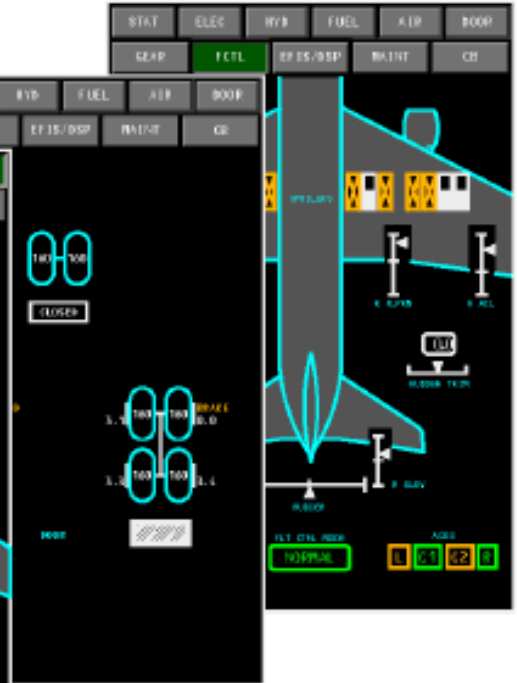
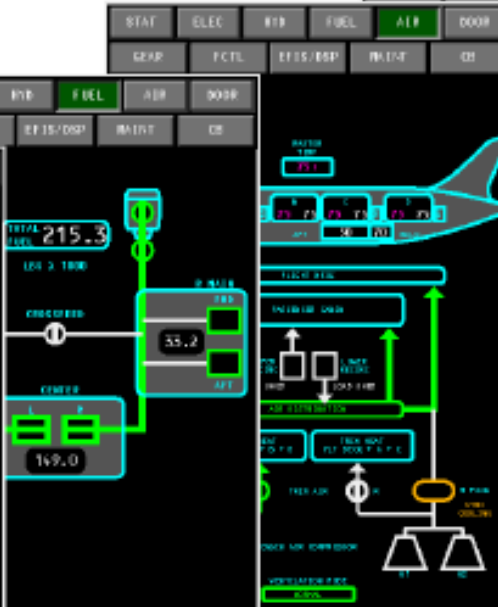
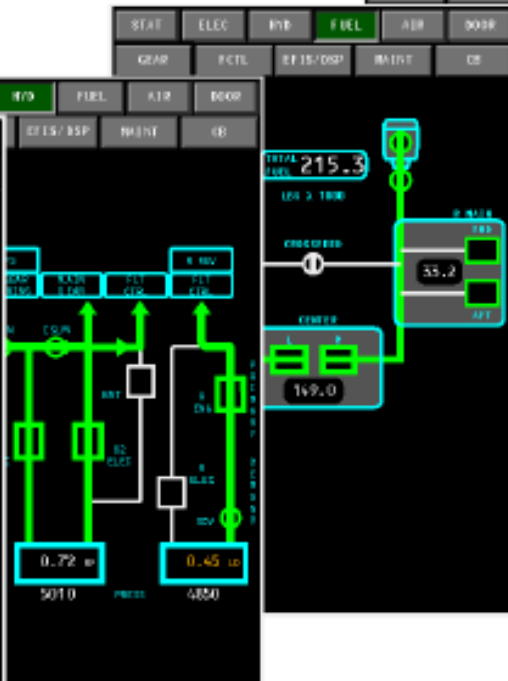
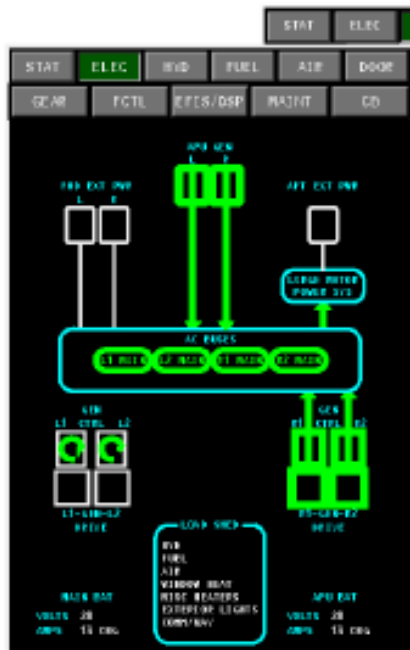
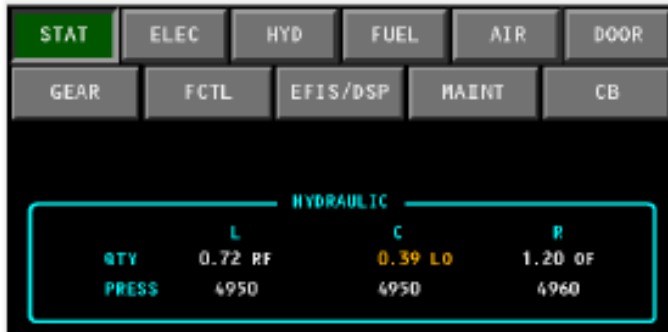
The synoptic pages provide a graphic representation of certain airplane systems. They are dynamic displays of real-time system data.

These are the synoptic displays:

- Electrical (ELEC)
- Hydraulic (HYD)
- Environmental control systems (AIR)
- Doors (DOOR)
- Landing gear (GEAR)
- Flight controls (FCTL).

Colors on the pages show conditions and states. These are the colors:

- Red – warning, limit, or exceedance
- Amber – caution, limit, exceedance, or failure
- Magenta – commands or targets
- Cyan – armed state
- Green – on or flow
- Gray – actual airplane condition





## Circuit Breaker Indication and Control Pages

The Circuit Breaker Indication and Control (CBIC) pages provide control and indication for the Electronic Circuit Breakers (ECB).

They also provide indication for most of the Thermal Circuit Breakers (TCB) on the airplane.

CBIC uses different icons to show the state of the CBs. These are the indications:

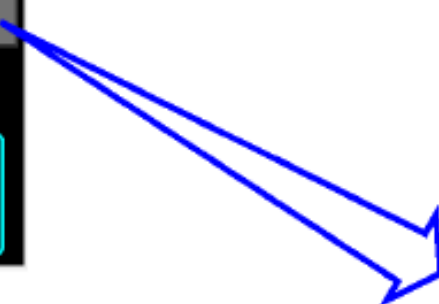
- Closed (green)
- Open (white)
- Locked – DO NOT CLOSE
- Locked – INOP
- Tripped (amber)
- Unknown (amber).

The CTRL selection allows the crew to change the state of the ECB.

The DATA page shows:

- Equipment number
- Position
- Status
- Lock details
- Rating
- System command
- Voltage out
- Load current
- Output status.

STAT	ELEC	HYD	FUEL	AIR	DOOR
GEAR	FCTL	EFIS/DSP	MAINT	CB	
HYDRAULIC					
	L	C	R		
QTY	0.72 RF	0.39 LO	1.20 OF		
PRESS	4950	4950	4960		



<b>SYS MENU</b>	FLIGHT DECK CB	OPEN / TRIP CB	CB BY STATE	CB SEARCH
CB BY ATA	CB BY LOCATION	RECENT USED CB	CB CUSTOM LIST	
<b>UPDATE LIST</b>		OPEN/ TRIP CB		
CE2127811	FAN-MISC CLG MC		DATA	CTRL
CE2127811	SPLY FAN-F/D EQPT CLG MC		DATA	CTRL
CE2127811	LOW FLOW DET-FWD EQPT CLG 1+ 3		DATA	CTRL 1
CE2127811	SPLY FAN-FWD EQPT CLG L MC		DATA	CTRL
CE2127811	VENT FAN-FWD EQPT CLG MC		DATA	CTRL
CE2127811	VENT FAN-FWD EQPT CLG R MC		DATA	CTRL
CE2127811	SMOKE OVRD VLV-F/D EQPT CLG 1 DP		DATA	CTRL 2
CE2127811	SMOKE OVRD VLV-F/D EQPT CLG 1 CL		DATA	CTRL
CE2127811	SMOKE OVRD VLV-F/D EQPT CLG 2 DP		DATA	CTRL
CE2127811	SMOKE OVRD VLV-F/D EQPT CLG 2 CL		DATA	CTRL 3
CE2127811	SMOKE DET-FWD EQPT CLG 1		DATA	CTRL
CE2127811	DYBO VLV-FWD EQPT CLG DP		DATA	CTRL
CE2127811	DYBO VLV-FWD EQPT CLG CL		DATA	CTRL 4
CE2127811	DYBO VLV-FWD EQPT CLG DP		DATA	CTRL
CE2127811	DYBO VLV-FWD EQPT CLG CL		DATA	CTRL