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## GENERAL

The purpose of the Central Maintenance System (CMS) is to ease the maintenance task by directly indicating in the cockpit the fault messages and allowing some specific tests.

Two levels of maintenance are possible :

at the line stop : equipment removal

at the main base : trouble shooting

## COMPONENTS

The CMS includes :

- the BITEs (Built In Test Equipment) of all electronic systems
- two fully redundant Central Maintenance Computers (CMCs)
- three MCDUs (Multipurpose Control Display Units) used also for FMGS, ACMS (Aircraft Condition Monitoring System) and ACARS (if installed) which dialogue with the CMC for display of information or initiation of tests.
- one printer (A4 format)

Normally only CMC 1 is used while CMC 2 is in stand-by. CMC 2 will automatically takes over if CMC 1 fails.

A push-button on the overhead panel allows to force the transfer to CMC 2 by setting the CMC 1 in off position.

## MODES OF OPERATION

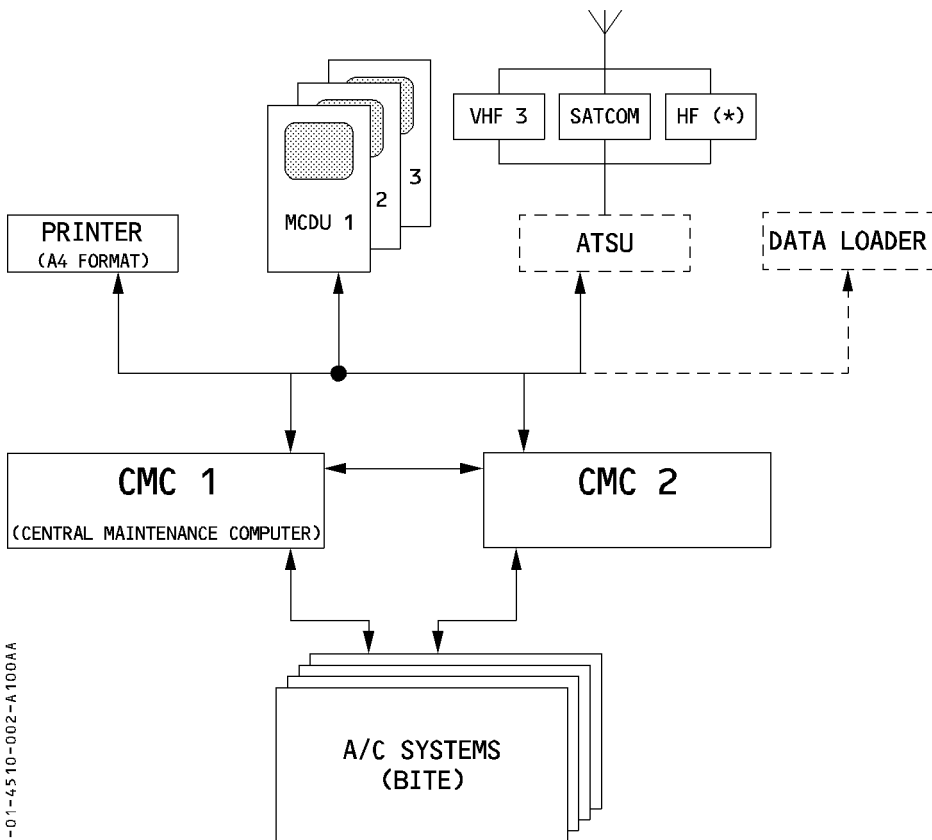
The CMS operates in two main modes :

- the NORMAL mode or REPORTING mode in flight
- the INTERACTIVE mode or MENU mode on ground

In NORMAL mode, the CMS records and displays the failure messages permanently transmitted by each system BITE.

In INTERACTIVE mode, the CMS allows the connection of any BITE system with the MCDU in order to display the maintenance data stored and formatted by the system BITE itself or to initiate a TEST.

**ARCHITECTURE**



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\* NOT YET INSTALLED FOR ATSU COMMUNICATIONS

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### FAILURE CLASSIFICATION

There are three classes of failure :

Class 1: Failures indicated to the flight crew by means of a flight deck effect (e.g. ECAM or instrument flags).

R

Class 2: Failures which can be left uncorrected until the next scheduled maintenance check (with a maximum delay of 600 FH).

Class 3: Failures not indicated to the flight crew, with no fixed time quoted for correction.

R

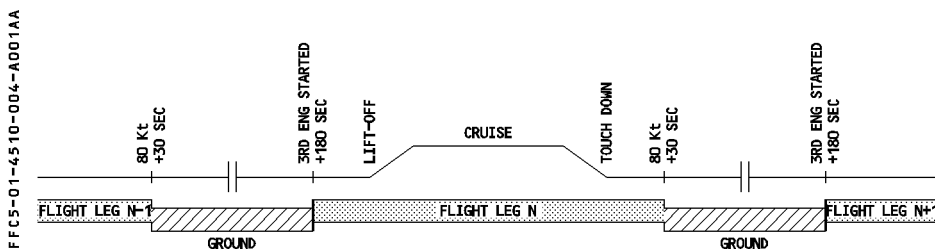
Failure Classes	Class 1	Class 2	Class 3
Operational consequences	YES	NO	NO
Indication to the flight crew	YES Automatically displayed in real time : - Warning or caution messages on Engine Warning Display - Flags on Primary Flight Display or Navigation Display, or System Display, - Local warning	YES STATUS flashing at the end of the flight : - Maintenance Status messages on SD	NO
Dispatch consequences	Refer to MEL may be: "GO" "GO IF" "NO GO"	MEL not applicable. "GO" without conditions. Corrections can be deferred for 600 flight hours.	MEL not applicable. No fixed time quoted for corrections. However, correction is recommended to improve dispatch reliability.
Indication to the maintenance team	YES Automatically print out at the end of each flight : Failure messages on the CMC Post Flight Report		YES On request, when needed, Failure messages on CMC Class 3 Report.

Note : Most Class 1 failures have an operational consequence on the current flight.  
Some Class 1 failures, such as MINOR FAULT, have no operational consequence on the current flight, but must be corrected in accordance with the MEL preamble, or the time specified in the associated dispatch condition of the MEL.

**CMS FUNCTIONS**

The main functions of the CMS are :

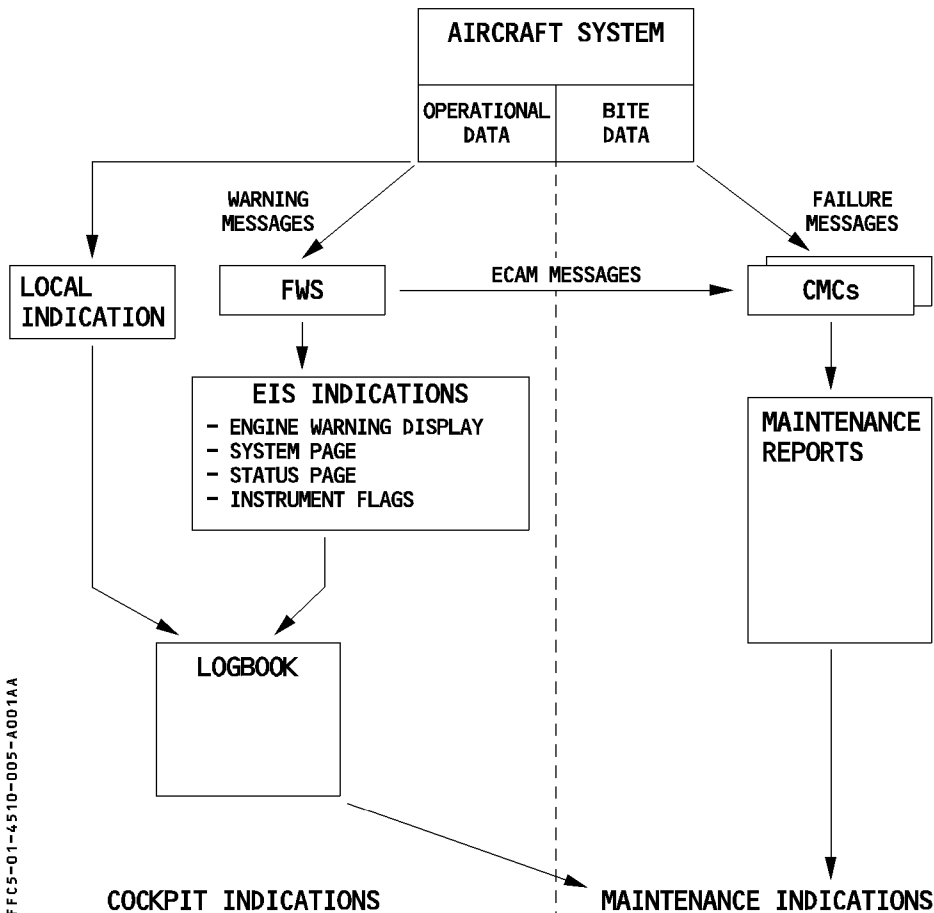
- acquisition and storing of messages transmitted by the connected system BITEs or by the Flight Warning Computer (Warning / Caution titles).
- elaboration of the maintenance phases.



- elaboration of the maintenance reports.
  - POST OR CURRENT FLIGHT REPORT  
Presents all ECAM warning/caution and failure messages (class 1 and 2 failures) recorded during the last flight leg or current flight leg.  
Available in flight and on ground.
  - PREVIOUS FLIGHT REPORT  
Presents all ECAM and failure messages recorded during the 63 previous flight legs (post flight reports).  
Available on ground only.
  - AVIONICS STATUS  
Presents in real time the systems affected by a failure.  
Available in flight and on ground.
  - CLASS 3 REPORT  
Presents the class 3 failure messages detected during the last flight leg.  
Available on ground only.
  - SYSTEM REPORT/TEST  
Allows interactive dialogue between any system and the MCDU.  
Available on ground only.



**COCKPIT / CMS INTERFACE**

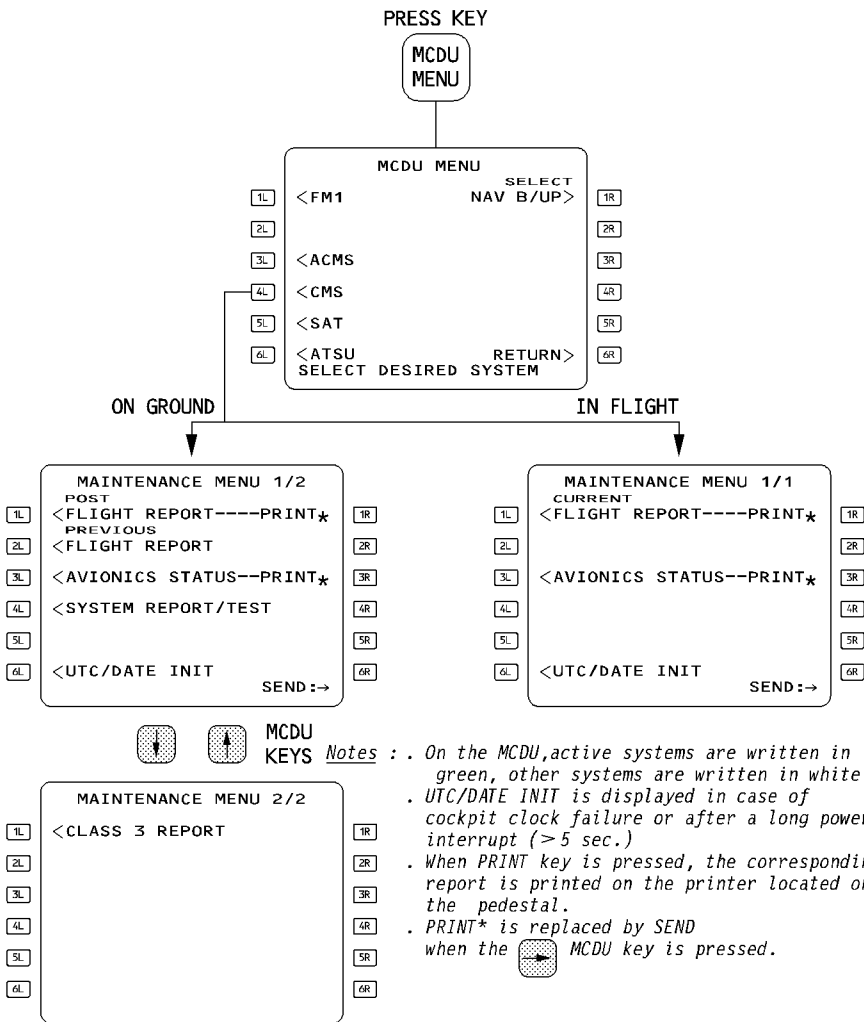


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**MAINTENANCE MENU**

The CMS uses menus displayed on the MCDU. The operator chooses the functions or reports via these menus.

Pressing the "MCDU MENU" key and then selecting CMS gives access to the MAINTENANCE MENU page. These pages are different in flight and on ground.

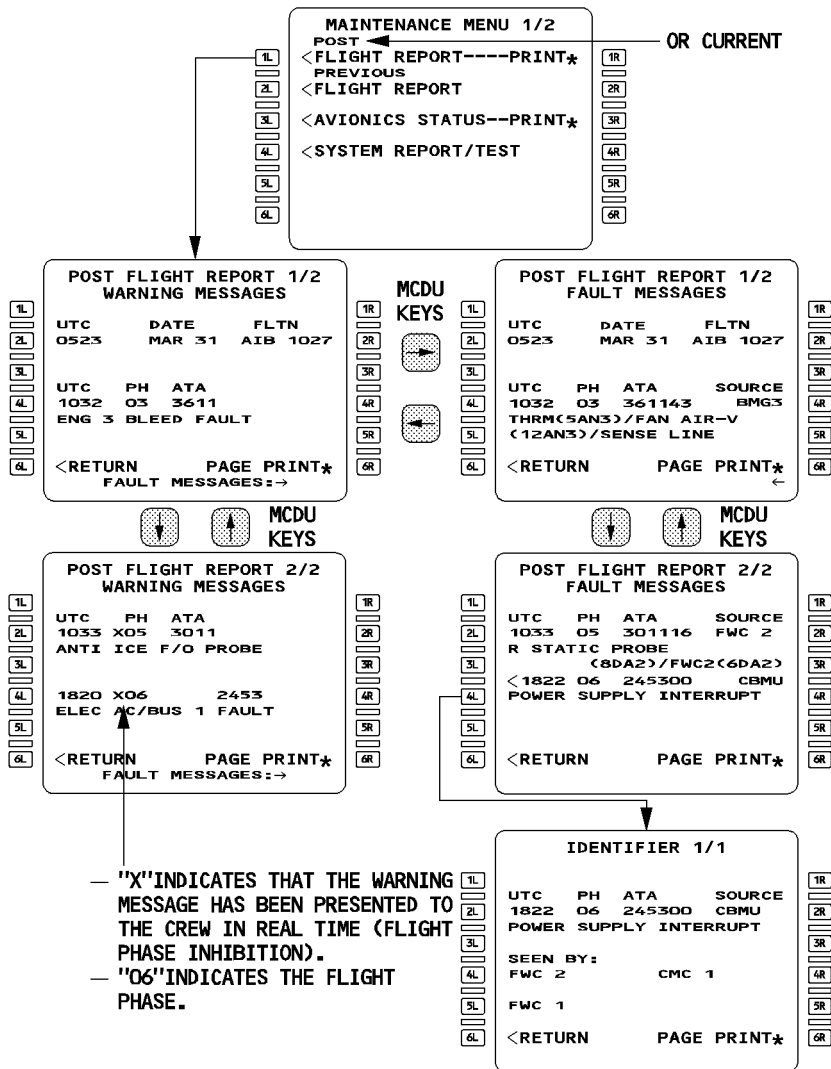


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**POST OR CURRENT FLIGHT REPORT**


POST FLIGHT REPORT on ground or CURRENT FLIGHT REPORT in flight, presents all class 1 and 2 failures and all system failure messages received by the CMS during the last flight leg or current leg.



— "X"INDICATES THAT THE WARNING MESSAGE HAS BEEN PRESENTED TO THE CREW IN REAL TIME (FLIGHT PHASE INHIBITION).  
 — "06"INDICATES THE FLIGHT PHASE.

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The POST or CURRENT FLIGHT REPORT is automatically printed after engines shut down or manually by selecting the PRINT key.

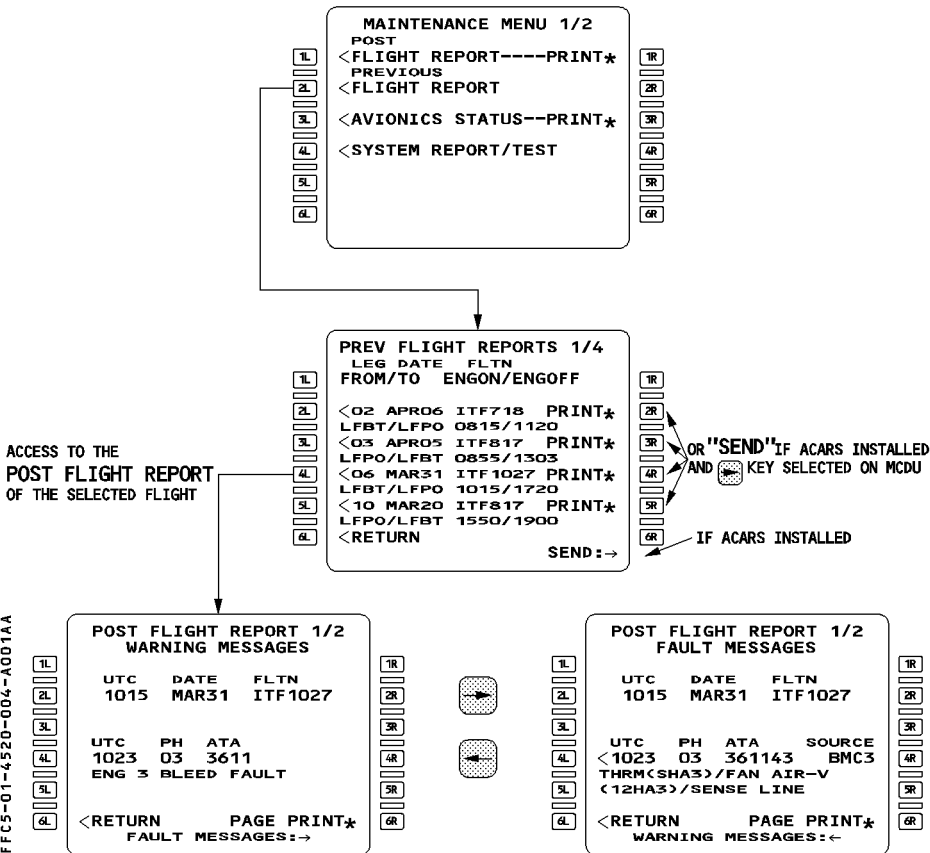
- R It is also automatically send to ACARS or ATSU (if installed) after engines shut down or manually by selecting SEND.

**POST FLIGHT REPORT print out**

MAINTENANCE (CURRENT or) POST FLIGHT REPORT			LEG-00
AIRCRAFT IDENTIFICATION : F-GGEA		ENGINE ON/ENGINE OFF : 1015/1720	PRINTING DATE : APR02
DATE : MAR31		FROM/TO : LFBO/LFBT	UTC : 1406
FLIGHT NUMBER : AIB 1027			
COCKPIT EFFECTS		FAULTS	
ATA 36-11 MESSAGE DISPLAYED : ENG 3 BLEED FAULT	UTC: 1032 FLIGHT PHASE : TAKEOFF ROLL	ATA 36-11-42 SOURCE : BMC3 MESSAGE : THRM (5HA3)/FAN AIR-V (12HA3)/SENSE LINE	INTERMITTENT  CLASS 1 IDENTIFIERS : CP1C CPC2
ATA 30-11 MESSAGE DISPLAYED : ANTI-ICE F/O PROBE	UTC: 1033 FLIGHT PHASE : CLIMB	ATA 36-11-16 SOURCE : PHC2 MESSAGE : R STATIC PROBE (8DA2)/ PHC2 (6DA2)	HARD  CLASS 1 IDENTIFIERS : ADIRU1 ADIRU2 ADIRU3
ATA 24-53 MESSAGE DISPLAYED : ELEC AC 1.1 BUS FAULT	UTC : 1822 FLIGHT PHASE : CRUISE	ATA 24-53-00 SOURCE : SDAC MESSAGES : POWER SUPPLY INTERRUPT	HARD  CLASS 1 IDENTIFIERS : CBMU
END OF REPORT (or CONTINUED, if more than 1 page)			

**PREVIOUS FLIGHT REPORT**

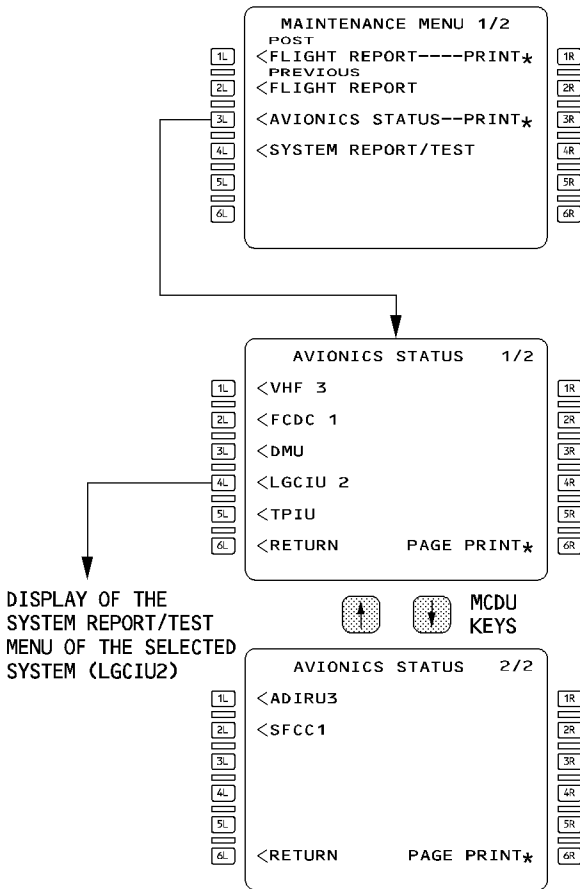
This report allows to have access to the POST FLIGHT REPORTS of the 63 previous flight legs.



On ground, the operator can print either a flight report or a screen copy. The format is identical to the POST FLIGHT REPORT's one. If ACARS or ATSU is installed, the operator can send a flight report by selecting the corresponding SEND key.

**AVIONICS STATUS**

- R This screen displays the list of systems affected by a Class 1 or 2 failure.
- R The Operator can press the button next to a system to directly call up that system page without going through the SYSTEM REPORT/TEST menu.
- R
- R



DISPLAY OF THE SYSTEM REPORT/TEST MENU OF THE SELECTED SYSTEM (LGCUI2)

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In flight, or on ground, the operator can either print the complete AVIONICS STATUS report, or only a copy of the screen.

**AVIONICS STATUS print out**

## MAINTENANCE AVIONICS STATUS

AIRCRAFT IDENTIFICATION : F-GGEA

PRINTING

DATE : APR10

UTC : 1830

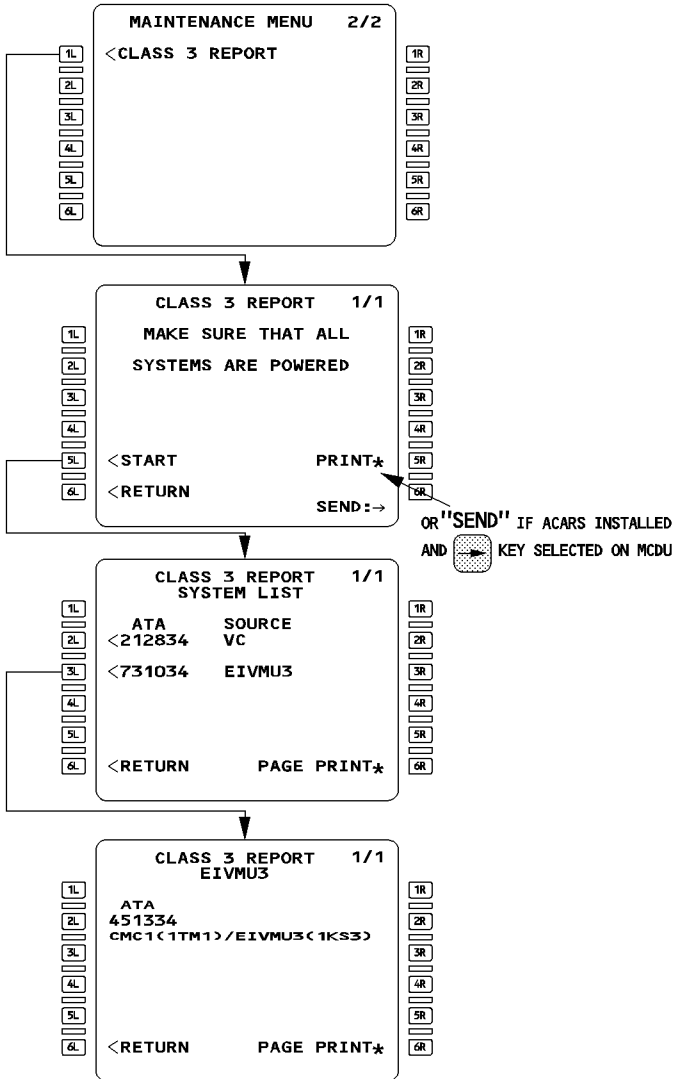
VHF3  
TPIUFCDC1  
ADIRU3DMU  
SFCC1

LGCIU2

END OF REPORT (or CONTINUED, if more than 1 page)

**CLASS 3 REPORT**

This report is created upon operator request only on ground. It presents all class 3 failure detected during the last flight leg, classified by ATA reference number.



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On ground, the operator can print either the complete report or only a screen copy. If ACARS or ATSU is installed, he can send the complete CLASS 3 REPORT.

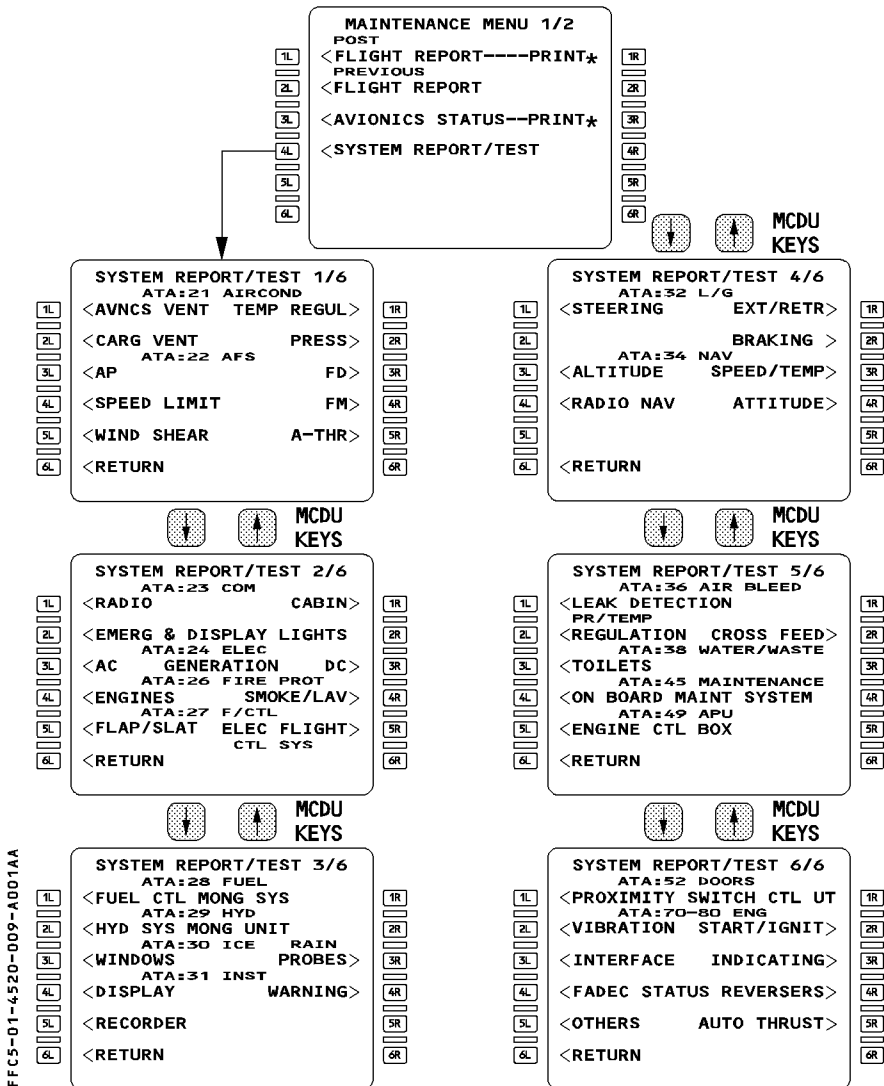
### CLASS 3 REPORT print out

MAINTENANCE CLASS 3 REPORT			
AIRCRAFT IDENTIFICATION : F-GGEA		PRINTING	DATE : APR10 UTC : 1830
SOURCE			
ATA	NAME	ATA MESSAGE :	ATA MESSAGE :
212834	VC	212830 OUTFLOW VALVE 10HL1 451334 CMC1(1TM1)/EIVMU3(1KS3)	213020 TEMP SENSOR 23HK
731034	EIVMU2	451334 CMC1(1TM1)/EIVMU3(1KS3)	
END OF REPORT (or CONTINUED, if more than 1 page)			

**SYSTEM REPORT / TEST**

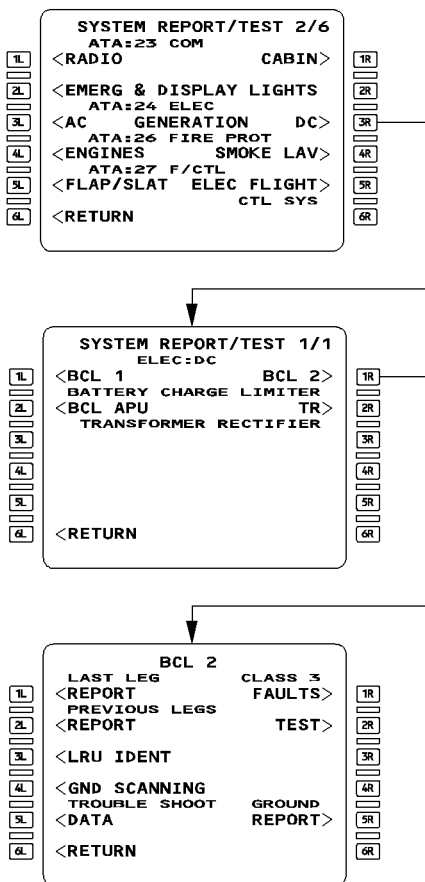
It allows access to all electronic systems. After the system selection, the CMC enters into the interactive dialogue with this system.

All systems are classified by ATA chapter on six MCDU pages.



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Example : access to BCL 2



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In this example, the operator has accessed to the menu of the selected systems :

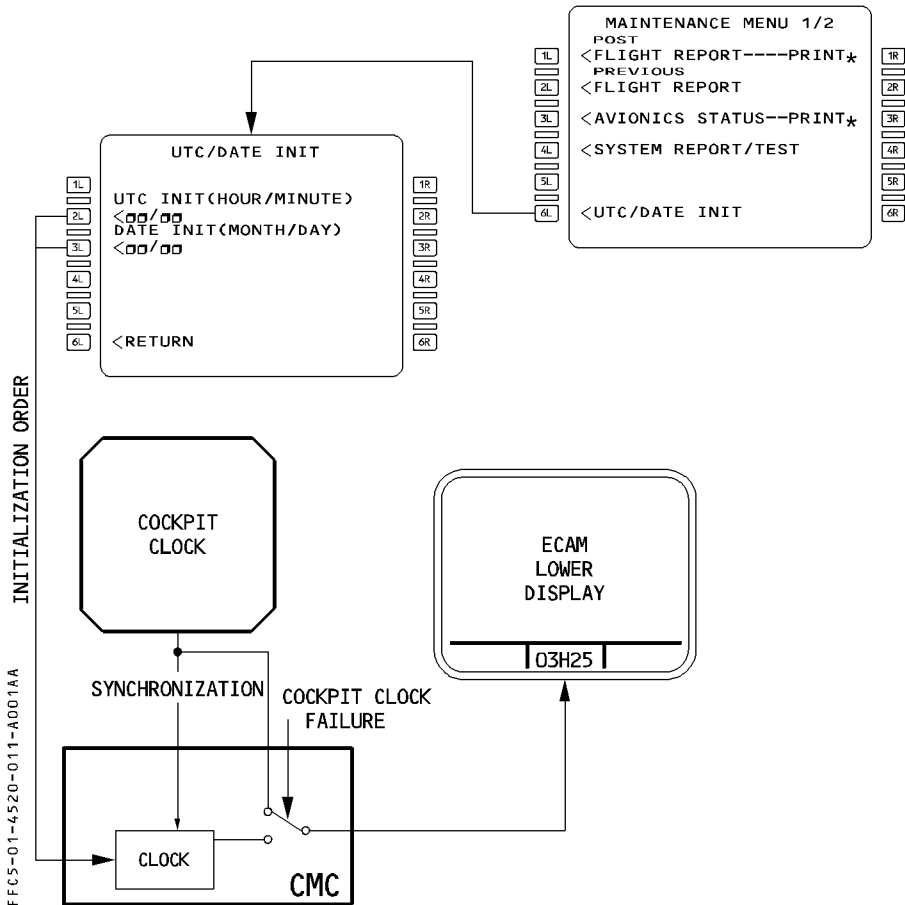
- LAST or PREVIOUS LEG REPORT : presents the list of LRU affected by a failure
- LRU IDENT : contains the P / N of all LRUs of the system.
- GND SCANNING : runs the flight monitoring on ground and presents the faulty LRU
- TROUBLE SHOOT DATA : provides system internal data concerning each failure.
- CLASS 3 FAULT : presents class 3 failures detected by the system during the last flight leg.
- TEST : runs the power up test and system test (if any) and display the result.
- GROUND REPORT : presents the list of LRU affected by a failure with the aircraft on ground.



**UTC / DATE INIT**

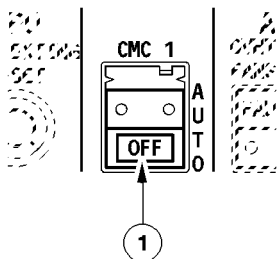
The CMC transmits to the aircraft systems, and the lower ECAM displays the GMT coming from the main clock (except in Phases 1 and 2, if the WBS system is installed). In case of cockpit clock failure, the internal clock of the CMC (synchronized on the cockpit clock) takes over. If, in addition, there is a long power interrupt (greater than 5 seconds), crew action is required to initialize the GMT and DATE via the MCDU.

R



**CMC RECONFIGURATION**

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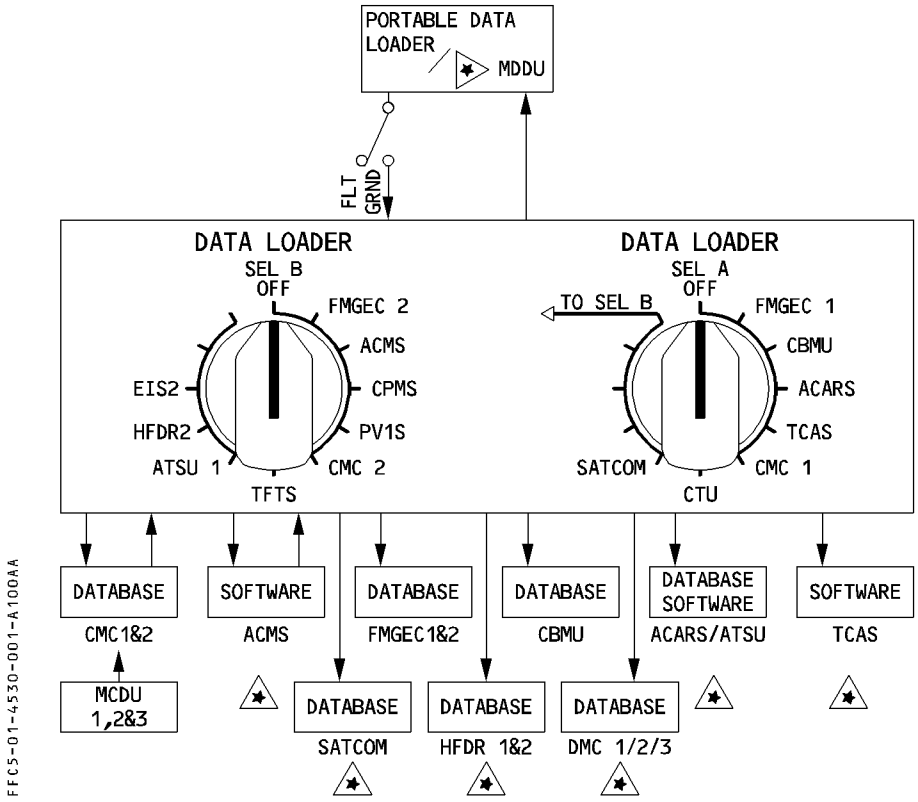
① CMC 1 pb sw

- AUTO** : CMC 1 is active while CMC 2 is in stand-by.  
 CMC 2 automatically takes over if CMC 1 fails.
- OFF** : CMC 1 selected off.  
 CMC 2 is active.

**DESCRIPTION**

With the data loading system, it is possible to either upload databases and operational software, or to download system reports from various onboard computers. Data transfer is performed on 3.5 inch diskettes, via a portable data loader or (◀) the aircraft's fixed Multipurpose Disk Drive Unit (MDDU). The Data Loader selector, on the overhead panel, enables the applicable aircraft system to be selected.

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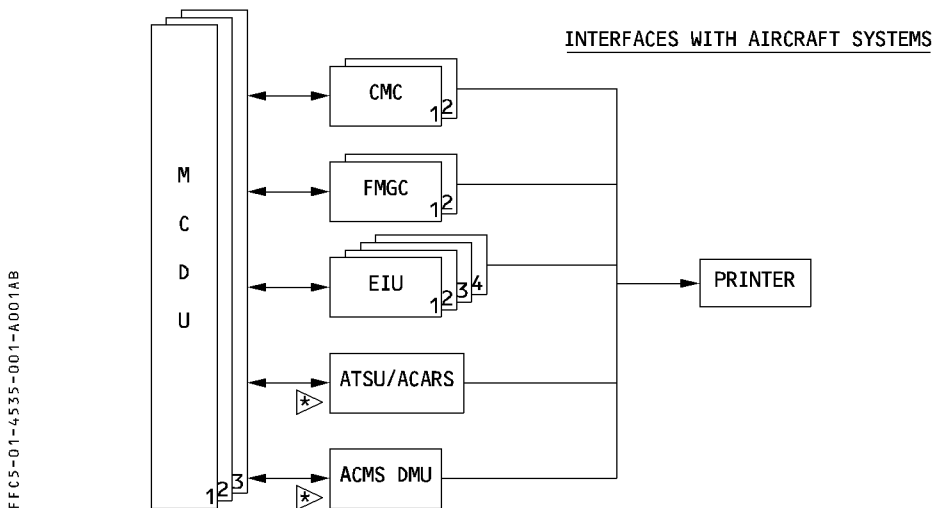


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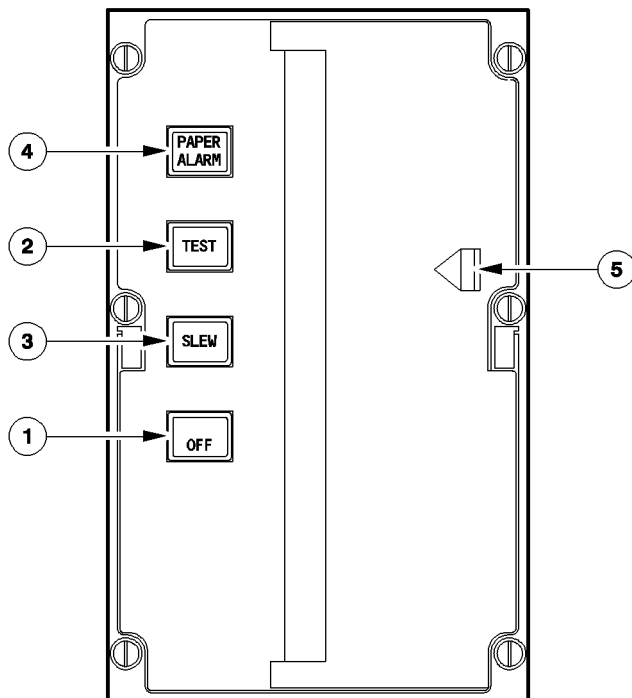
**DESCRIPTION**

The printer is the output unit for data printing which can be generated either manually from the MCDUs or automatically depending on the system.

The data printings are described in the CMC FUNCTIONS description 1.45.20 or in the according system descriptions.



The printer is installed at the rear of the pedestal on the F/O side.

**CONTROLS AND INDICATORS**

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**① OFF pb sw**

**OFF** : OFF light (amber) comes on steady, printer is off.

**On** : OFF light extinguishes, then after approximately 30 seconds it illuminates for 10 seconds while power up test is performed. Then the printer is in normal operation provided :

- no indication light on front panel is illuminated
- the access door is closed
- there is paper in front of the print head.

*Note* : When a printer internal fault is detected the pushbutton illumination will come on steady.

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## ② TEST pb

When depressed a printing of a test pattern is performed, provided the printer is not in communication with a connected system. During test the OFF light is flashing.

## ③ SLEW pb sw

The SLEW pb sw is used to exit paper from the printer.

## ④ PAPER ALARM pb sw

The pb sw is illuminated when there is approximately less than 25 ft of paper available in the printer.

For testing the PAPER ALARM light the pushbutton is depressed. The illumination goes off approximately 2 seconds after releasing the pushbutton.

*Note : If SLEW and PAPER ALARM pb sw are depressed at the same time.*

- *during the printout of a message, the printout is aborted. PAPER ALARM pb illuminates.*
- *while there is no printout, access door is open and paper roll outside the printer, the paper is moved rearward. This function can be used in case of a paper jam inside the printer.*

## ⑤ PRINTER DOOR latch

The printer door latch locks the printer door. The access door is spring loaded and stays open when released. On the inner side of the door, a label gives paper loading instructions.



<b>BUS EQUIPMENT LIST</b>
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	NORM			EMER ELEC		
	AC	DC	DC BAT	AC ESS	DC ESS	HOT
CMC 1				GND		
CMC 1 SWITCHING		DC 1				
CMC 2	AC 2-4					
CMC 2 SWITCHING		DC2				
DATA LOADER	AC 1-2					
PRINTER	AC 1-1					