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ATA 31 INDICATING/RECORDING SYSTEMS

31–32 CENTRALIZED FAULT DISPLAY INTERFACE (CFDIU)

CFDS PRESENTATION

CFDIU

The CFDIU (**C**entralized **F**ault **D**isplay **I**nterface **U**nit) receives failure messages from the aircraft systems.

It memorizes and manages them. Information is available in various reports.

The CFDIU consists of two distinct channels:

- a **NORMAL CHANNEL** which ensures all the functions.
- a **BACKUP CHANNEL** (optionally) which permits restricted operation when the normal channel is faulty.

BITE

The BITE (**B**uilt **I**n **T**est **E**quipment) is a function incorporated in the computers which detects, localizes and memorizes failures.

All systems including a BITE are connected to the CFDIU.

ECAM

The ECAM monitors the aircraft systems. The warning information is delivered to the Centralized Fault Display System.

FWC (**F**light **W**arning **C**omputer).

Only the primary and the independent failure information is sent to the CFDS.

MCDU

The MCDU (**M**ultipurpose **C**ontrol and **D**isplay **U**nit) is a display unit and a keyboard used by the CFDS to display and interrogate BITE‘s and to initiate system tests.

The 2nd MCDU is also connected to the CFDS.

You can only use the CFDS on one MCDU at a time.

PRINTER

The PRINTER is used for printing information automatically or on request.

ACARS

The ACARS (**A**ircraft **C**ommunication **A**ddressing and **R**eporting **S**ystem) is used to exchange data between the aircraft and a ground station via a radio VHF link.

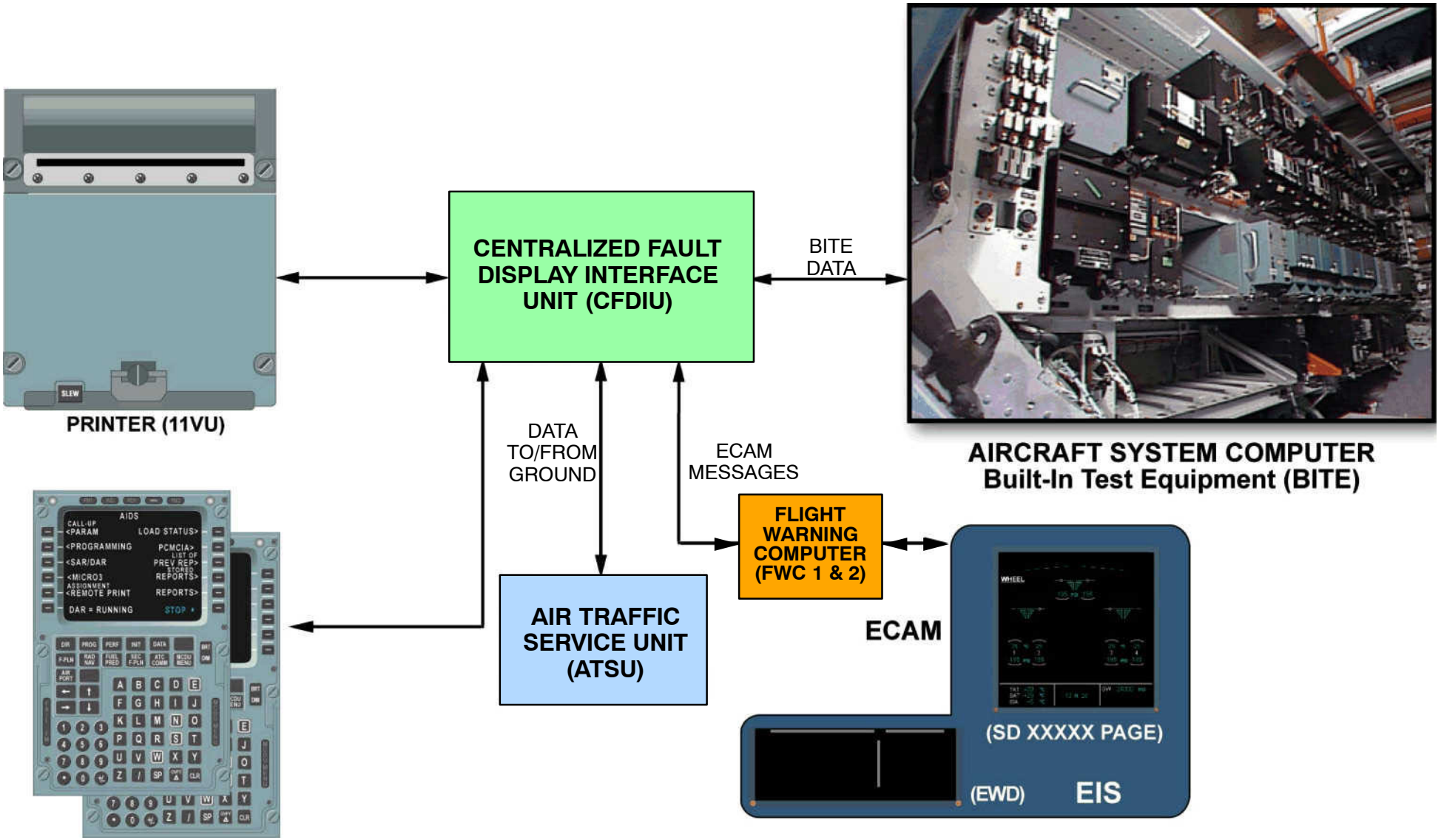


Figure 1 CFDS Overview

SYSTEM BITE PHILOSOPHY

BITE

Most aircraft system computers are equipped with a BITE (**B**uilt–**I**n **T**est **E**quipment). The BITE, which is an electronic device (hard + soft), monitors permanently the system operation. When a failure is detected, it is stored in the BITE memory and is transmitted to the CFDIU (**C**entralized **F**ault **D**isplay **I**nterface **U**nit). Memorization of the 64 previous legs report is done by most of the BITEs.

MEMORIZATION

Memorization of failures is different when the aircraft is on ground or in flight. The full BITE functions and memorization operate in flight.

On ground, the memorization is done only in the BITEs. The BITEs are provided with flight and ground memory zones.

CFDIU

The CFDIU centralizes all information concerning aircraft system failures. Reading or printing of all the failure information is done in the cockpit.

The CFDS (**C**entralized **F**ault **D**isplay **S**ystem = CFDIU + BITEs) functions are accessed through the MCDUs.

CFDS MODES

Two CFDS modes are available: NORMAL and MENU modes. The MENU MODE is available only on ground.

NORMAL MODE

In this mode, the CFDIU scans all the connected system outputs and memorizes the failure messages in order to generate the CURRENT (LAST) LEG REPORT and the CURRENT (LAST) LEG ECAM REPORT. In flight the CFDS always operates in the normal mode.

MENU MODE

In this mode on ground, the CFDIU dialogues with one computer at a time in order to read the contents of its BITE memory and to initiate various tests.

This mode can not be selected in flight.

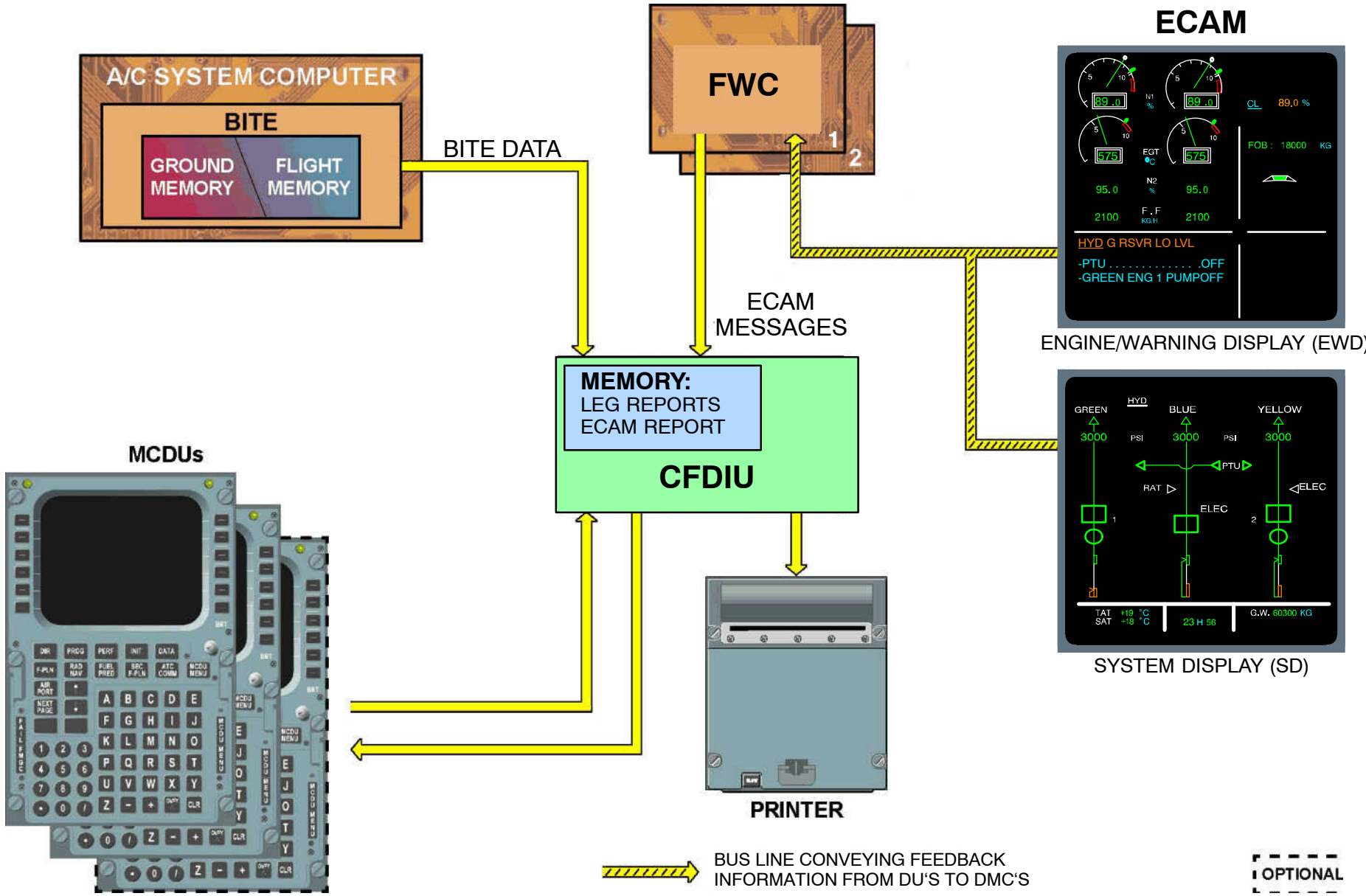


Figure 2 BITE Philosophy

SYSTEM BITE PHILOSOPHY CONTINUED

REPORTS

LAST/CURRENT LEG REPORT

A CURRENT LEG REPORT is elaborated during the flight. After the flight, its title becomes LAST LEG REPORT.

The purpose of this item is to present the failure messages, concerning all systems, occurred during the last/current flight.

Each message contains:

- The test of the failure,
- the ATA reference and the flight phase
- and time at which the failure occurred.

A function correlates the ”SOURCE” failure message with the ”resulting” failure messages.

SOURCE: Name of system affected by a failure.

IDENTIFIER: Name of system affected by an external failure, which is correlated with the ”SOURCE” failure.

The CFDIU capacity for failure messages memorization is up to 40 lines.

LAST/CURRENT LEG ECAM REPORT

A CURRENT LEG ECAM REPORT is elaborated during the flight. After the flight, its title becomes LAST LEG ECAM REPORT.

The purpose of this item is to present the warning messages displayed on the upper ECAM display unit during the last/current flight.

These are **primary or independent** warnings.

Each message contains:

- The ECAM warning,
- the ATA reference and the flight phase
- and time at which the warning was triggered.

When several identical and consecutive warnings are transmitted, the CFDIU memorizes the first occurrence only and carries on counting with a **maximum of 8**. The occurrence counter is displayed between brackets at the end of the message. The CFDIU capacity for warning messages memorization is up to 40 lines.

POST FLIGHT REPORT

The PFR (**P**ost **F**light **R**eport) is the sum of the LAST LEG REPORT and of the LAST LEG ECAM REPORT. The PFR can only be printed on ground. The list of ECAM WARNING MESSAGES and FAULT MESSAGES with the associated time, flight phase and ATA reference allow the maintenance crew to make a correlation for easier trouble–shooting.

Beginning of PFR recording:

- if flight number inserted prior to first engine start:
  - first engine start + 3 minutes.
- if not:
  - aircraft speed > 80 knots.

End of PFR recording:

- Aircraft speed < 80 knots + 30 seconds.

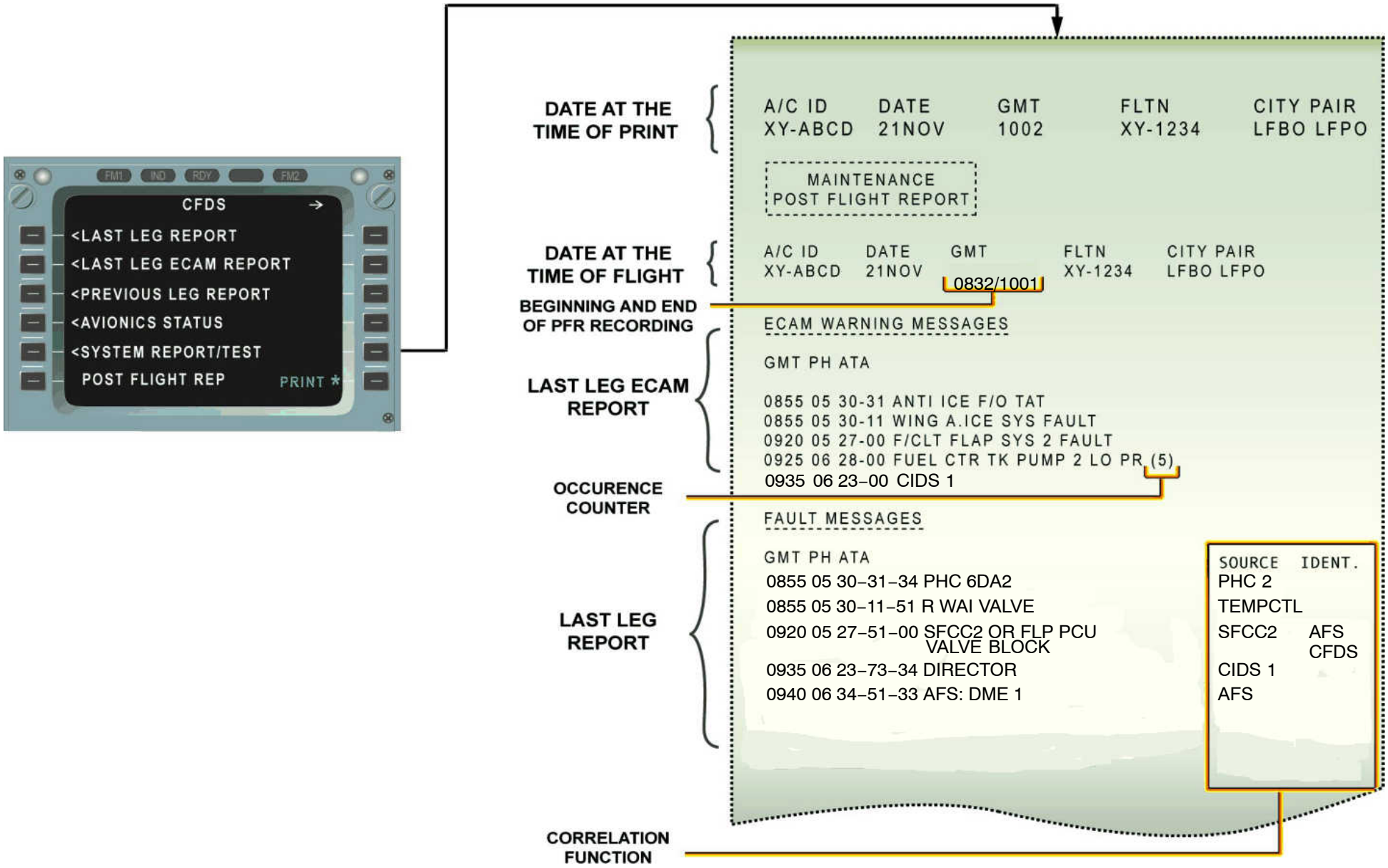


Figure 3 Reports Presentation

SYSTEM BITE PHILOSOPHY

Internal/External Failures

Each BITE (**B**uilt–**I**n **T**est **E**quipment) can make the difference between an internal and an external failure.

Let us suppose that an angle of attack sensor failure has been detected and that systems A, B and C are affected by this failure.

The AIR DATA system will transmit an INTERNAL FAILURE (= SOURCE on the POST FLIGHT REPORT).

Systems A, B and C will transmit EXTERNAL FAILURE (= IDENTIFIERS on the POST FLIGHT REPORT).

Memorization

Memorization of failures is different when the aircraft is on ground or in flight.

The full BITE functions and memorization operate in flight.

On ground, the memorization is done only in the BITEs.

The BITEs are provided with flight and ground memory zones.

Failure Gravity

The failures are classified according to their importance.

Class 1 failures are the most serious ones and require an immediate maintenance action subject to the minimum equipment list.

Class 2 failures may have consequences if a second failure occurs.

A maintenance action is necessary at the next adequate opportunity.

Class 3 failures can be left uncorrected until the next scheduled maintenance check.

CFDS MODES PRESENTATION

Two CFDS modes are available. NORMAL MODE is always active except on ground when MENU MODE is selected.

- **NORMAL MODE**

  In this mode, the CFDIU scans all the connected system outputs and memorizes the failure messages in order to generate the current (last) leg report and the current (last) leg ECAM report. In flight the CFDS always operates in normal mode.

- **MENU MODE**

  In this mode, the CFDIU dialogues with one computer at a time in order to read the contents of its BITE memory and initiate various tests (SYSTEM REPORT/TEST).
  This mode can not be selected in flight.

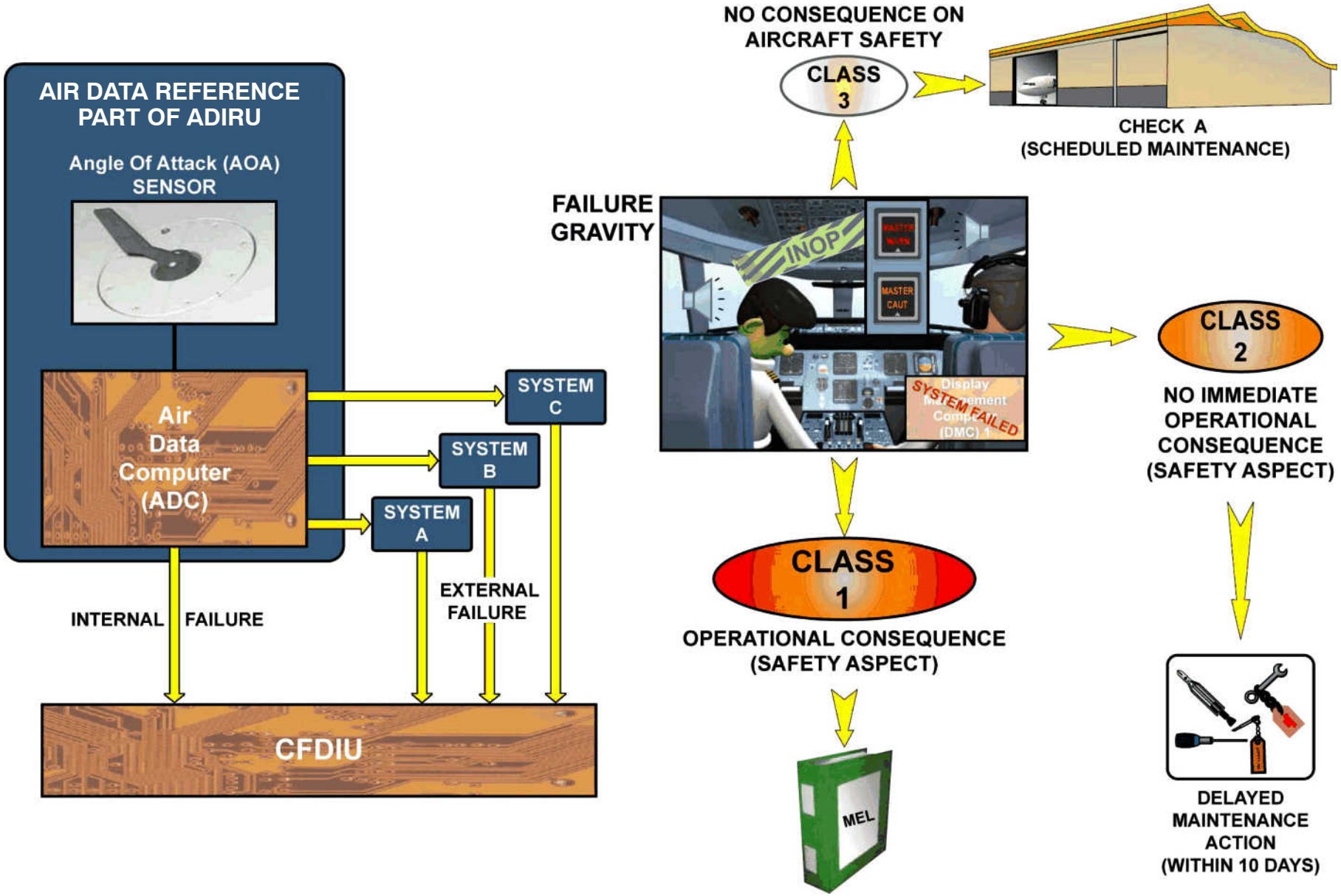


Figure 4 Internal/External Failures & Failure Gravity

SYSTEM BITE TYPES INTERFACE

Type 1 Systems

Most Systems are type 1 systems. These systems can memorize failures occurred in the **last 64 flight legs**.

Type 1 systems are connected to the CFDIU (**C**entralized **F**ault **D**isplay **I**nterface **U**nit) via an ARINC 429 input bus and an ARINC 429 output bus.

- **SINGLE COMPUTER**

  The first configuration in TYPE 1 is a single computer.

  Example: VHF 1 Transceiver

- **MULTI COMPUTER**

  The second configuration in TYPE 1 includes several computers in the same aircraft system.

  One computer concentrates the maintenance data of the other computers.

  Example: FMGC (**F**light **M**anagement and **G**uidance **C**omputers) and FAC (**F**light **A**ugmentation **C**omputer) with

  FMGC1 as A

  FMGC2 as B

  FAC as C

- **DUPLICATED SYSTEM**

  A duplicated system includes two different subsystems in the same computer.

  Example: ADIRU (**A**ir **D**ata and **I**nertial **R**eference **U**nit) with

  ADR as subsystem 1

  IR as subsystem 2

Type 2 Systems

Type 2 Systems memorize only failures from t**he last flight leg**.

The discrete signal is provided to initiate the test of the system.

Example: AEVC (**A**vionics **E**quipment **V**entilation **C**omputer)

Type 3 Systems

Type 3 Systems are simple systems linked to the CFDS by only two discrete signals.

Type 3 systems **can not memorize failure messages**.

The discrete input permits to initiate the test or reset.

The discrete output indicates if the system is OK or not.

Example: TRU (**T**ransformer **R**ectifier **U**nit)

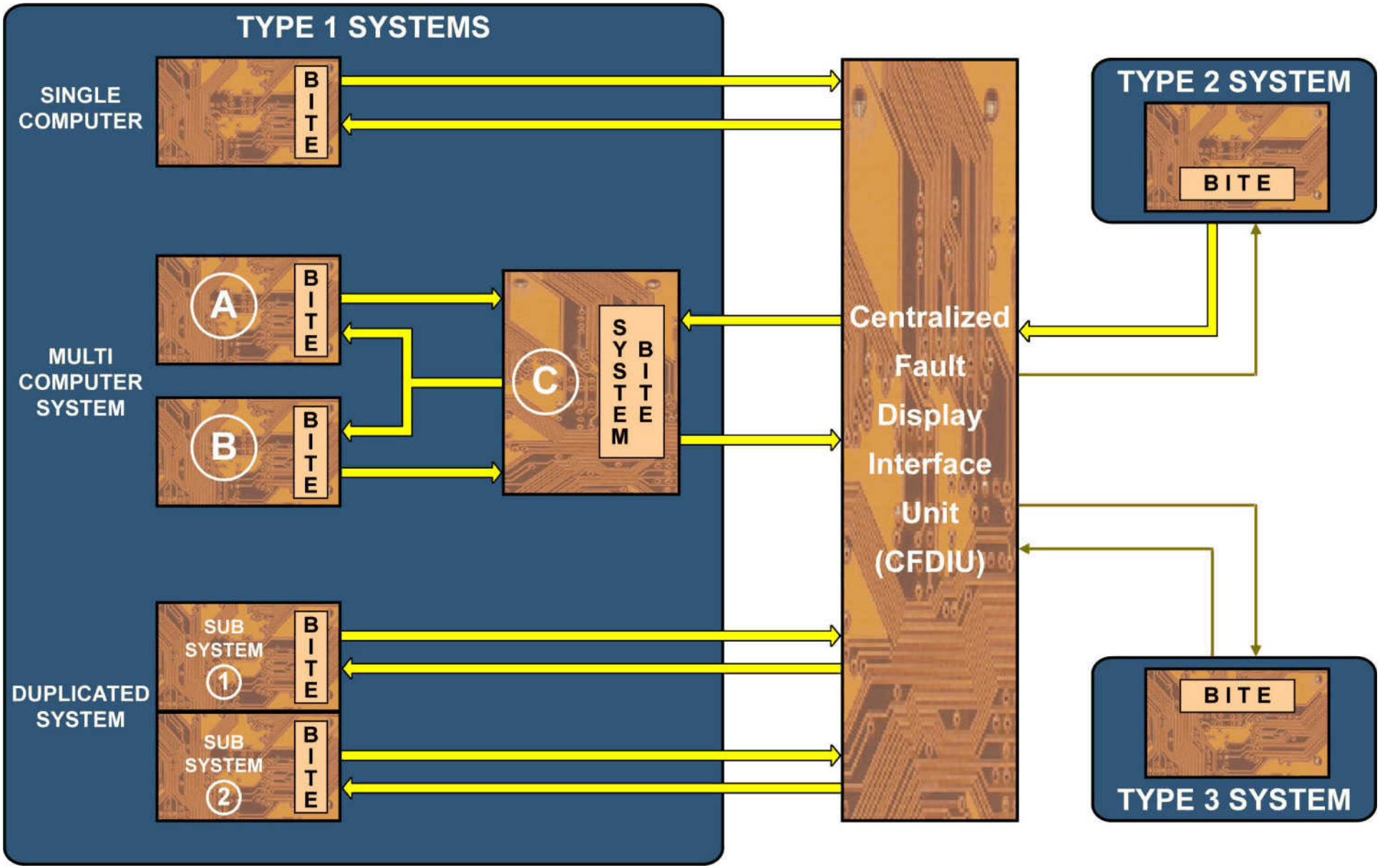


Figure 5 System Types

CLASS 1 FAILURE PRESENTATION

Class 1 failures have an operational consequence on the flight.

You can display the class 1 failures on the MCDU (**M**ultipurpose **C**ontrol and **D**isplay **U**nit):

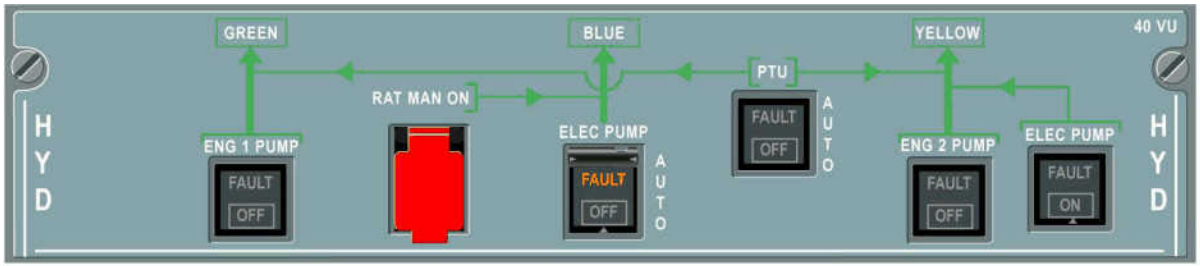
- In the LAST (or CURRENT) LEG REPORT
- In the LAST (or CURRENT) LEG ECAM REPORT.

These faults are also indicated to the crew in flight:

- by the ECAM system (upper and/or lower DU (**D**isplay **U**nit)).
- by local warning in the cockpit.

Refer to the MMEL (**M**aster **M**inimum **E**quipment **L**ist):

- ”GO“,
- ”GO IF”,
- ”NO GO”.

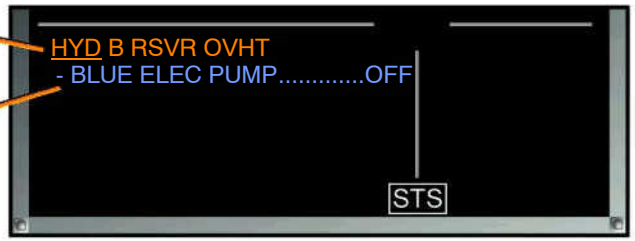


LOCAL WARNING ON SYSTEM CONTROL PANEL (HYDRAULIC)

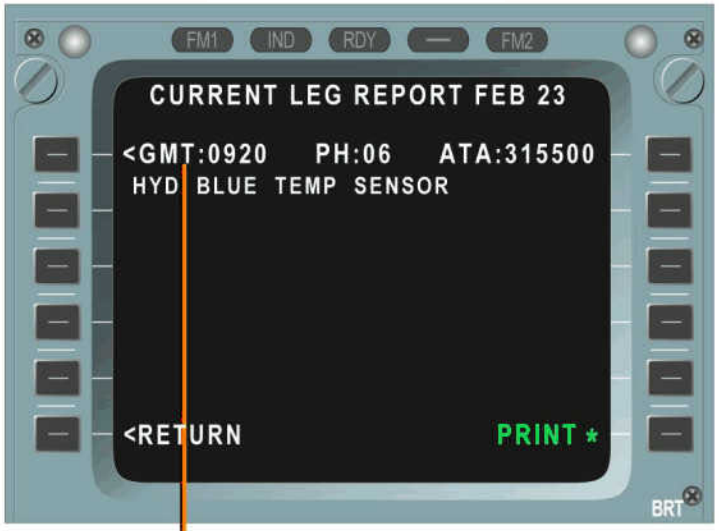
CLASS 1

NATURE OF THE FAILURE

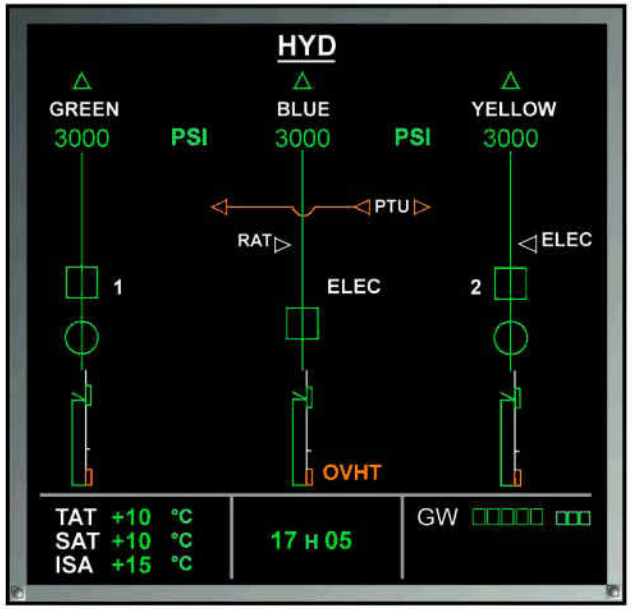
ACTION TO BE PERFORMED



MCDU IN FLIGHT



(131 VU)



TIME OF CFDS FAULT RECEPTION

AUTOMATIC DISPLAY OF THE AIRCRAFT SYSTEM PAGE RELATED TO THE FAILURE

Figure 6 Class 1 Failure Indication and Annunciation

CLASS 2 FAILURE PRESENTATION

Class 2 failures have no immediate operational consequence and can be displayed on request on the ECAM STATUS page after Engine shut down.

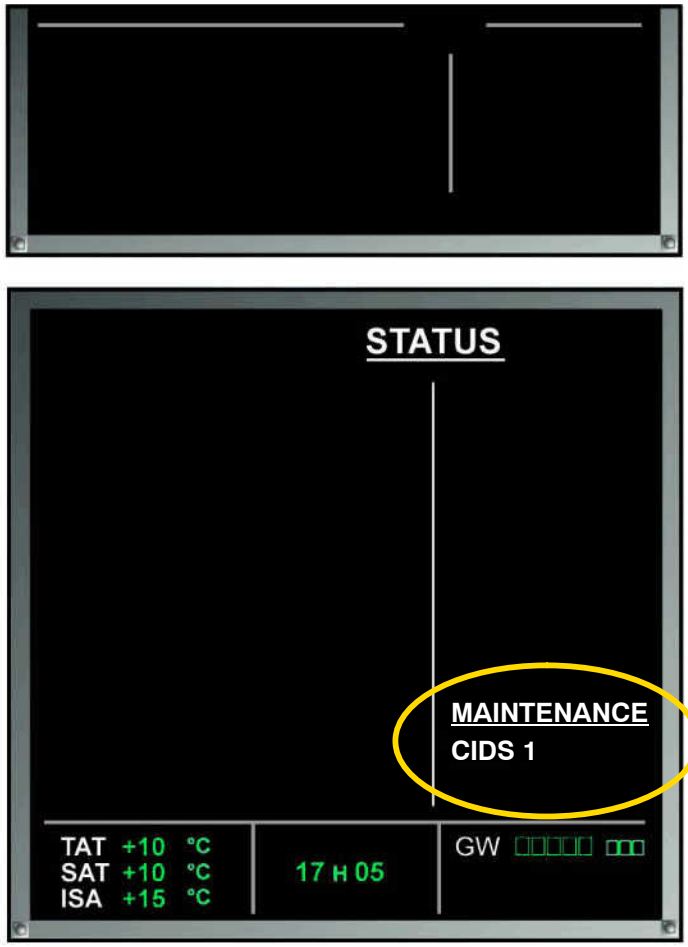
You can display the class 2 failures on the MCDU (**M**ultipurpose **C**ontrol and **D**isplay **U**nit):

- In the LAST (or CURRENT) LEG REPORT
- In the LAST (or CURRENT) LEG ECAM REPORT.

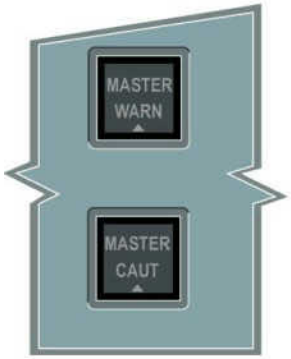
Refer to the MMEL: ”GO” without condition.

Example: CIDS Director 1 Fault (**C**abin **I**ntercommunication **D**ata **S**ystem).

CLASS 2



MANUAL SELECTION OF THE "ECAM STATUS" PAGE



(131 VU)

MCDU IN FLIGHT

Indication after Engine Shut down

Figure 7 Class 2 Failure Presentation

CLASS 3 FAILURE PRESENTATION

Class 3 failures have no operational consequence.

All aircraft systems remain available.

You can display the name of the systems affected by at least a class 3 failure in the AVIONICS STATUS.

The Class 3 failures can be left uncorrected until the next scheduled maintenance check. (At least before 400 hours or a A check).

Do not refer to the MMEL.

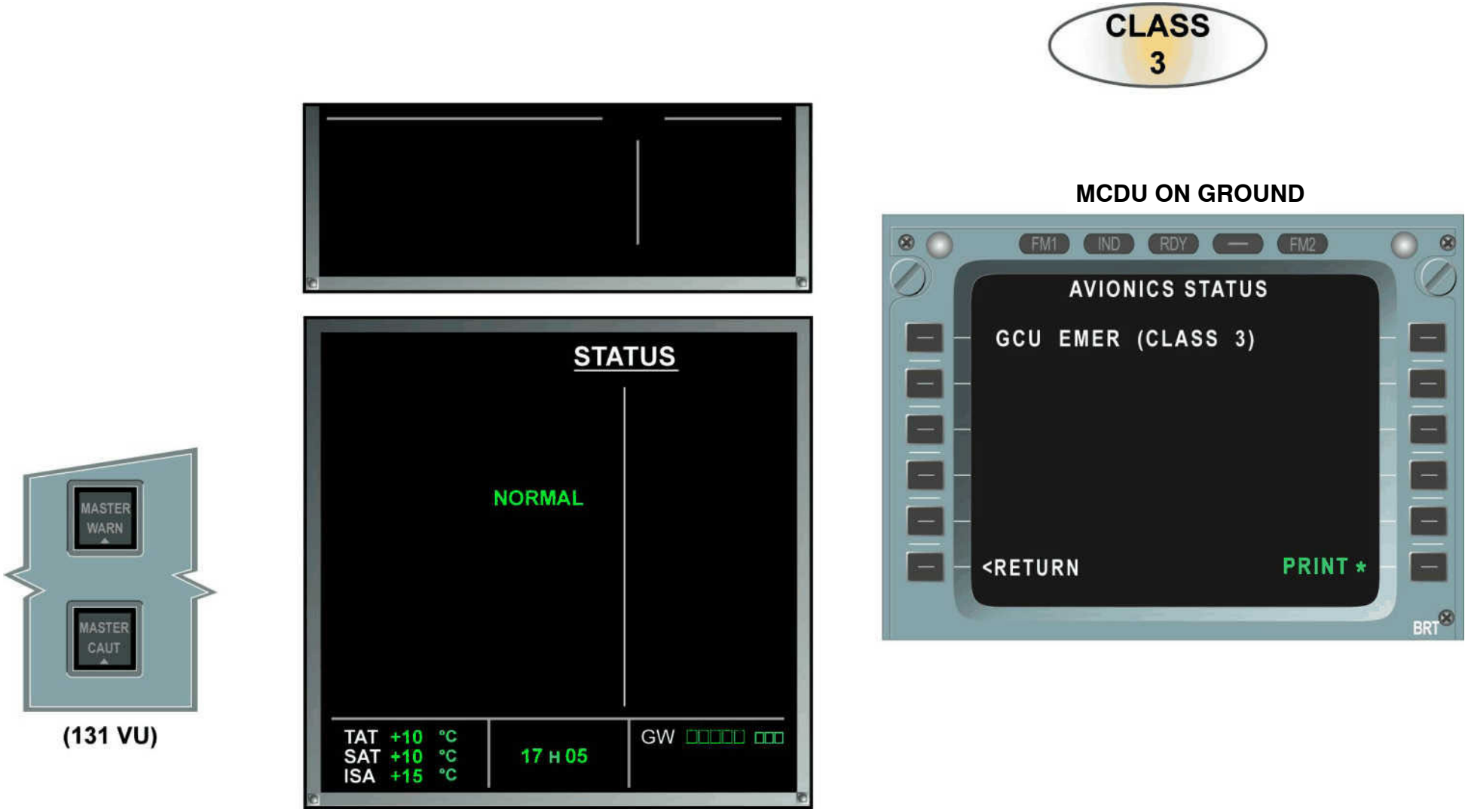


Figure 8 Class 3 Failure Presentation

SYNTHESIS SYSTEM DESCRIPTION AND FAILURE CLASSES OVERVIEW

GENERAL

AVIONICS STATUS displays on ground the title of the systems currently affected by any failure class.

Class 1 and 2 failures are displayed in the LAST LEG REPORT and in the LAST LEG ECAM REPORT.

Only Class 1 & 2 Faults are shown on the PFR.

CFDS SYSTEM TYPES

- **Type 1 BITE**
  - Access with ARINC Input and ARINC Output buses.
  - Menu–mode access from MCDU.
- **Type 2 BITE**
  - Access with Discrete Input and ARINC Output bus.
  - Pseudo menu–mode access from MCDU.
- **Type 3 (No System-BITE available)**
  - System–access with Discrete Input and Output wires.
  - Only Test/Reset functions available.

SYSTEM FAILURE CLASSES

- **Class 1**

  With operational consequences on actual flight.
  - Indicated to the crew as: warnings, cautions, local lights, and sounds, ECAM–messages, instrument flags.
  - Must be entered into the Log–book.
  - Require immediate maintenance action.
- **Class 2**

  With no operational consequences on actual flight.
  - Indicated to the crew as:
    - In–flight:

      depending on FWC software, on the STATUS page only.
    - After engine shutdown:

      by pulsing STS reminder.
  - Must be entered into the Log–book.
  - Compatible to content of MMEL (Master Minimum Equipment List)
  - Normally a “GO“-Item without condition (C-Item).
  - Exceptional cases require immediate maintenance action under certain condition.
- **Class 3**
  - Not indicated to the crew. CFDS access on ground only.
  - Can wait until next A–check (every 400 hours).

ECAM WARNING LEVELS

- **Level 3 Red Warnings**
  - RED WARNINGS with Master Warning Light, Continuous Repetitive Chime or specific sound and ECAM message.
  - Immediate crew action:
    - Aircraft in dangerous configuration
    - Limits exceeded
    - Flight safety directly involved.
- **Level 2 Amber Cautions**
  - AMBER WARNINGS with Master Caution Light, Single Chime and ECAM–message.
  - Immediate crew attention:
    - Aircraft in abnormal situation
    - Flight safety not directly involved
- **Level 1 Amber Messages**
  - No Master Caution Light.
  - No aural warning.
  - ECAM–message only.
- **Advisory**

  Advisory–reminder in Engine/Warning Display (EWD), pulsing parameter in System Display (SD) Should be monitored from the crew.

	CLASS 1 FAILURE	CLASS 2 FAILURE	CLASS 3 FAILURE
Operational consequence on the current flight	YES	NO	NO
Indicated to the pilots	YES Warnings/flags System pages	YES On the STATUS page	NO
Dispatch consequences	REFER TO MEL May be: "GO","GO IF" or "NO GO"	FUNCTIONS LOST INDICATED IN MEL "GO" without condition	NO REFERENCE IN MEL
Maintenance information	Have to be reported by the pilots in the log book. Are indicated at the end of each flight leg. MEL entry is required. 		Available on request. No fixed time for correction.

Figure 9 Failure Classification Synthesis

MULTIPURPOSE CONTROL AND DISPLAY UNIT DESCRIPTION

MCDU GENERAL

There are several different versions of MCDUs installed in the A320 family. The older ones are equipped with CRTs (**C**athode **R**ay **T**ubes) the new generation have LCDs (**L**iquid **C**rystal **D**isplays).

1. The brightness knobs enable the brightness of the display to be adjusted.

2. By pressing the MCDU menu key, the MCDU menu page is displayed, and any one of the systems connected to the MCDU can be selected. The green colour indicates the system already in dialogue with the MCDU. The other systems are displayed in white.

3. A multiple page display is indicated by an arrow in the right upper corner of the screen. In this case the key with the right arrow (or “NEXT PAGE“ depending on MCDU version) must be used to give access to the various pages of the display.

4. Some systems like the Flight Management System or Aircraft Integrated Data System contain too many data for a single page.
   In this instances, vertical scroll keys can be used to scroll display, up or down.
   The scroll keys can be used as long as these arrows are displayed.

NOTE: The vertical scroll keys are not used for any CFDS menu.

5. Twelve line select keys, six on the left and six on the right, give access to a page or a function.
   The line select keys permit access to a page or a function when these symbols appear (>, <, *).
   They are identified as 1L to 6L on the left, and 1R to 6R on the right.

6. The MCDU menu annunciator illuminates white when a system connected to the MCDU request the display.

6. The CRT contains 14 lines, each having 24 characters.
   The top line is used as title line and the bottom one, is the scratchpad.
   Two character size can be used, as well as various colours: white, cyan, green, amber.
   Various symbols <, >, *, →, ↑, ↓ can be displayed to indicate special functions.

NOTE: The MCDU is part of the Auto Flight System (AFS).
For more details refer to ATA 22–82.

MCDU LCD VERSION

MCDU CRT VERSION

Figure 10 MCDU LCD & CRT Version

CFDS REPORTS TROUBLESHOOTING

GENERAL

On ground, all the functions are available.

In flight, only CURRENT LEG REPORT and CURRENT LEG ECAM REPORT are available.

Note that the CFDS menu comprises two pages on ground.

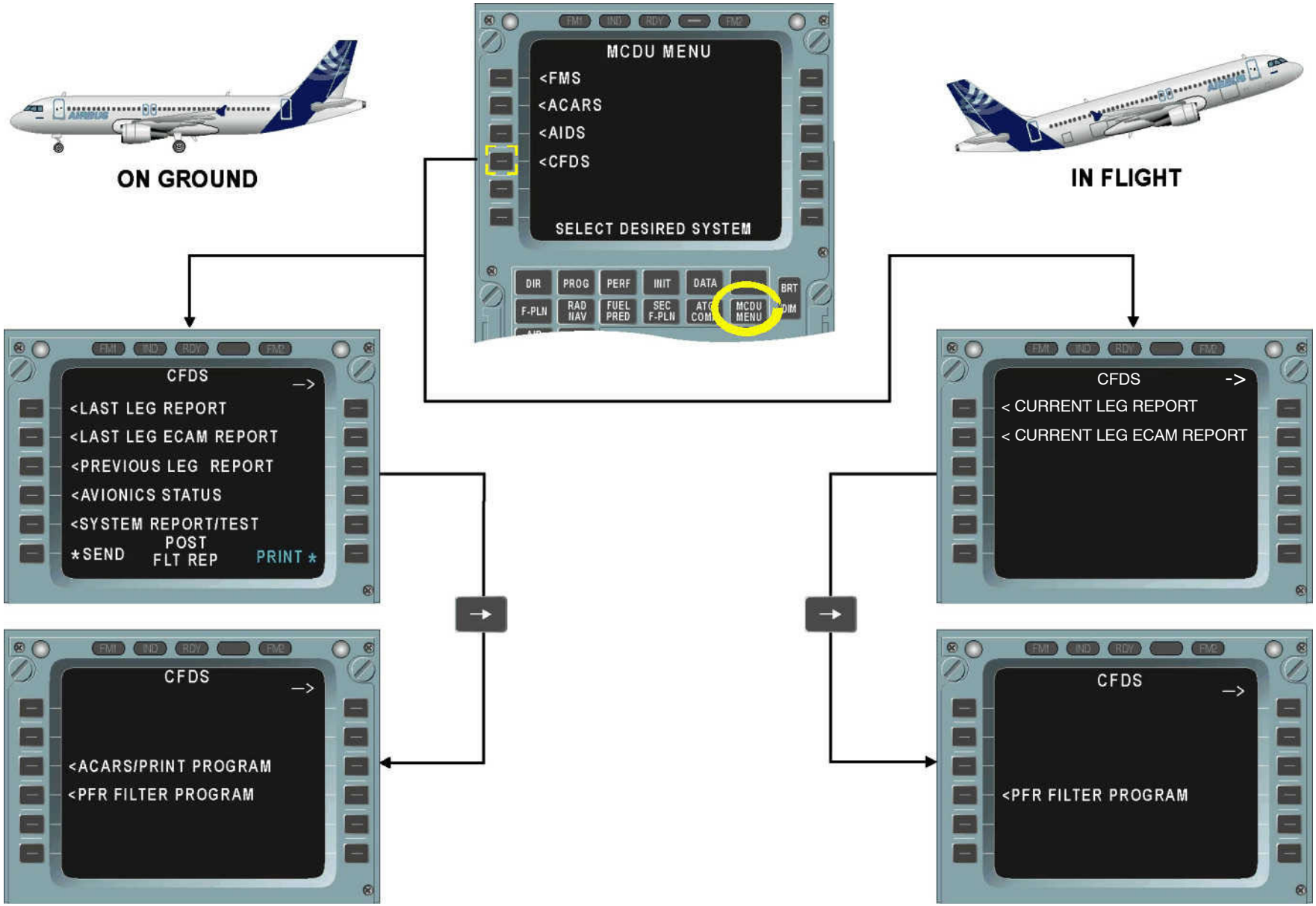


Figure 11 CFDS Menus on Ground and in Flight

LAST LEG REPORT

The LAST LEG REPORT displays failure information delivered by the BITE‘s of the aircraft systems.

It can store up to 20 failures occurred during the last leg.

When a key is pressed where a prompt is displayed beside the “GMT“ indication a page is displayed showing the “SOURCE/IDENTIFIERS“.

The Last Leg Report displays the internal failures (class 1 and 2) only.

- On the ground, the title of this item is ”LAST LEG REPORT”.
- In the flight, it is ”CURRENT LEG REPORT”.

When the report is displayed on several pages, an arrow appears on the top right–hand corner. The NEXT PAGE or arrow key permits to see the following pages.

If you select the NEXT PAGE or arrow key on the last page, you come back to the first page.

When you select the PRINT line key, the complete LAST LEG REPORT is printed, even if it contains several pages.

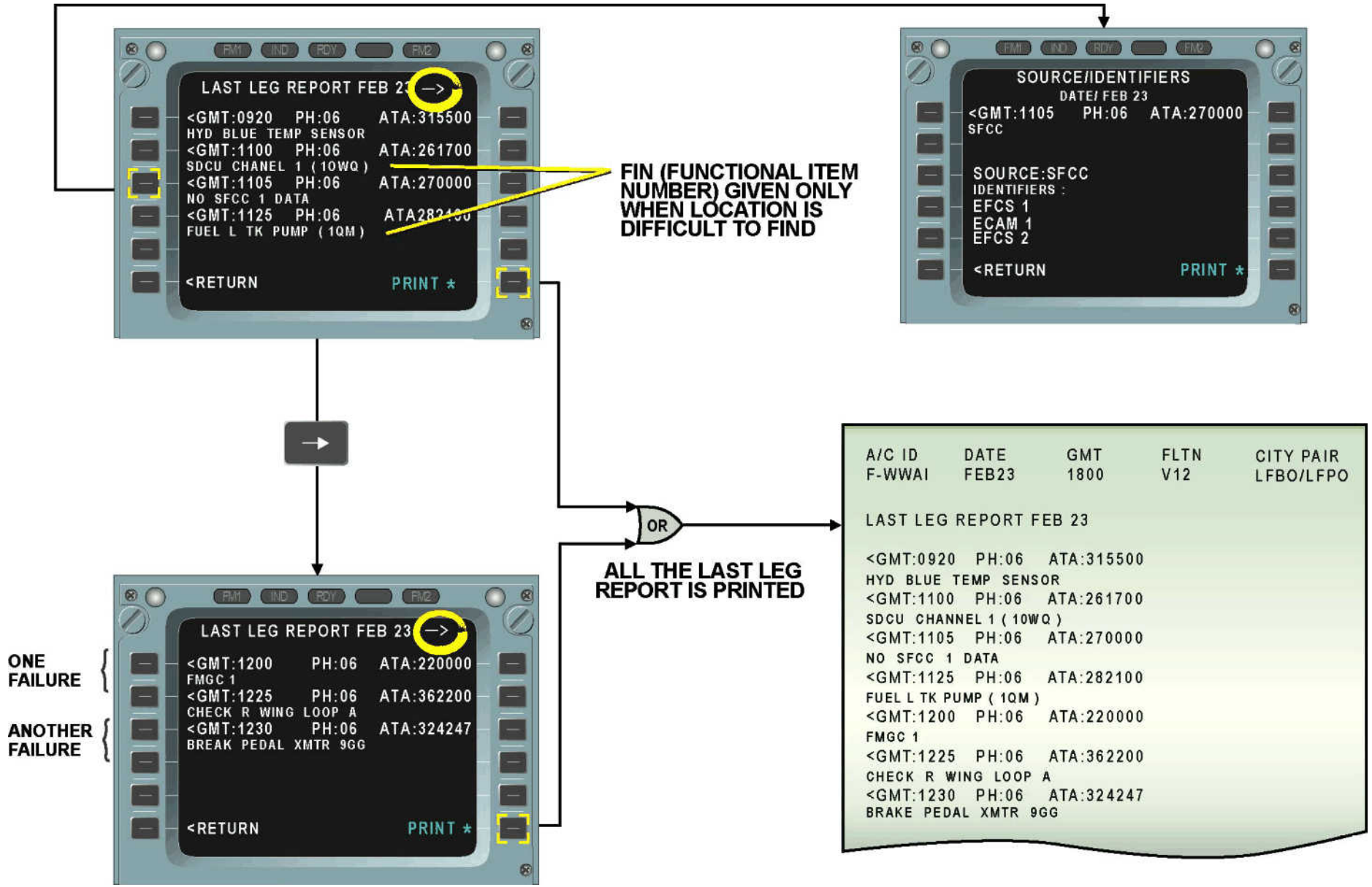


Figure 12 Last Leg Report

LAST LEG ECAM REPORT

The LAST LEG ECAM REPORT displays the list of ECAM warning messages sent to the CFDIU by the flight warning computers.

It can store up to 20 warnings occurred during the last leg.

On ground, the title of this item is ”LAST LEG ECAM REPORT”,

in flight it is ”CURRENT LEG ECAM REPORT”.

DOCUMENTARY DATA appears on the print report:

- the A/C identification
- the city pair
- the flight number
- date and GMT (UTC).

All the reports are printed.

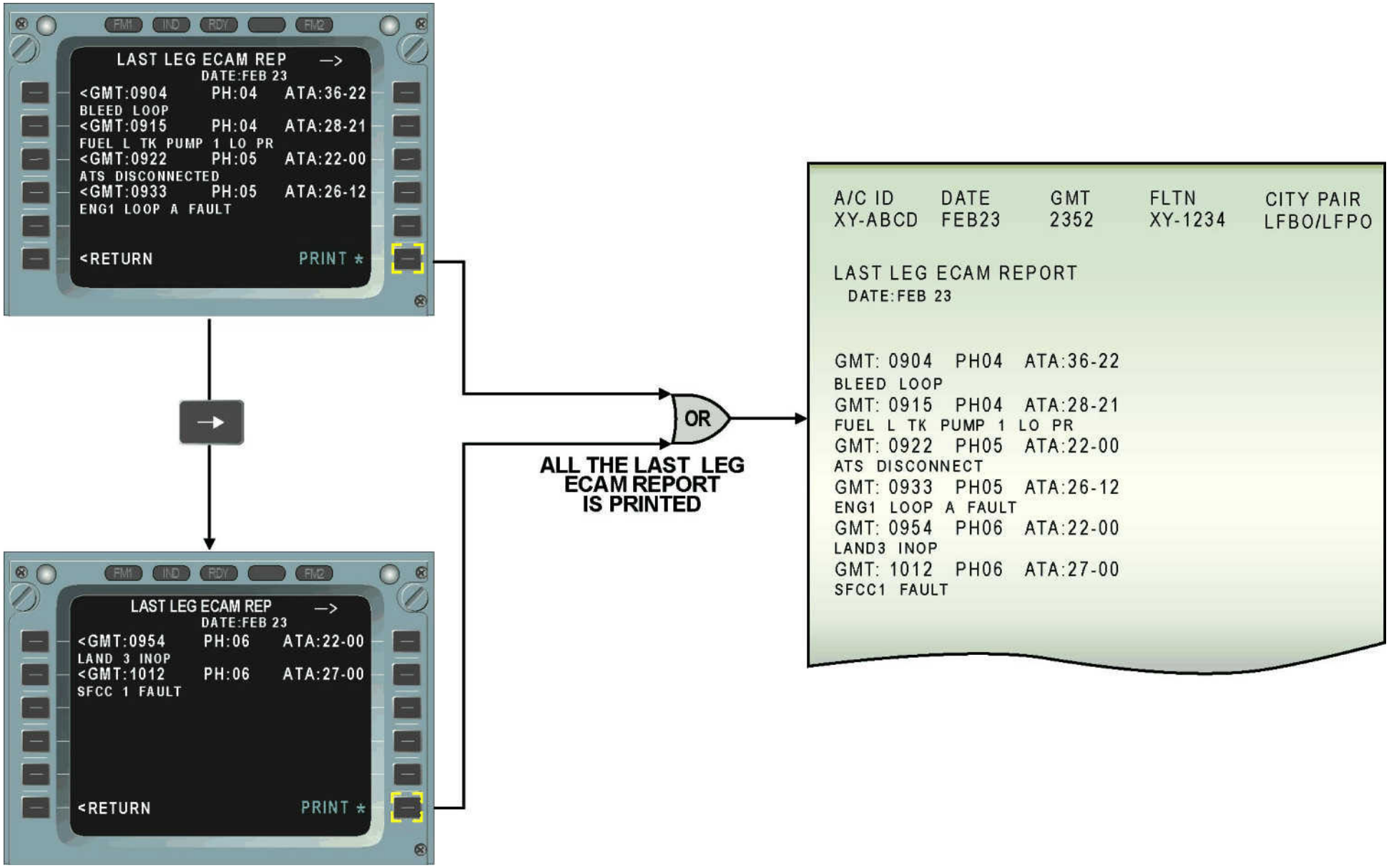


Figure 13 Last Leg ECAM Report

PREVIOUS LEGS REPORT

At each new flight leg, the content of the LAST LEG REPORT is transferred into the PREVIOUS LEGS REPORT.

This report can store up to 200 failures over the last 63 flight legs.

Each failure message contains the same data as the LAST LEG REPORT:

i.e.: NO FAC 1 DATA
FEB 23 13 12
22–00–00

It also contains a flight leg counter relative to the previous flight.

–XX is the number of flight legs before the last flight leg:

i.e.: 01 (previous leg).

The PREVIOUS LEGS REPORT is displayed only on ground.

(INTM) means that the failure has occurred intermittently.

When you make a print of the PREVIOUS LEGS REPORT, only the displayed page is printed.

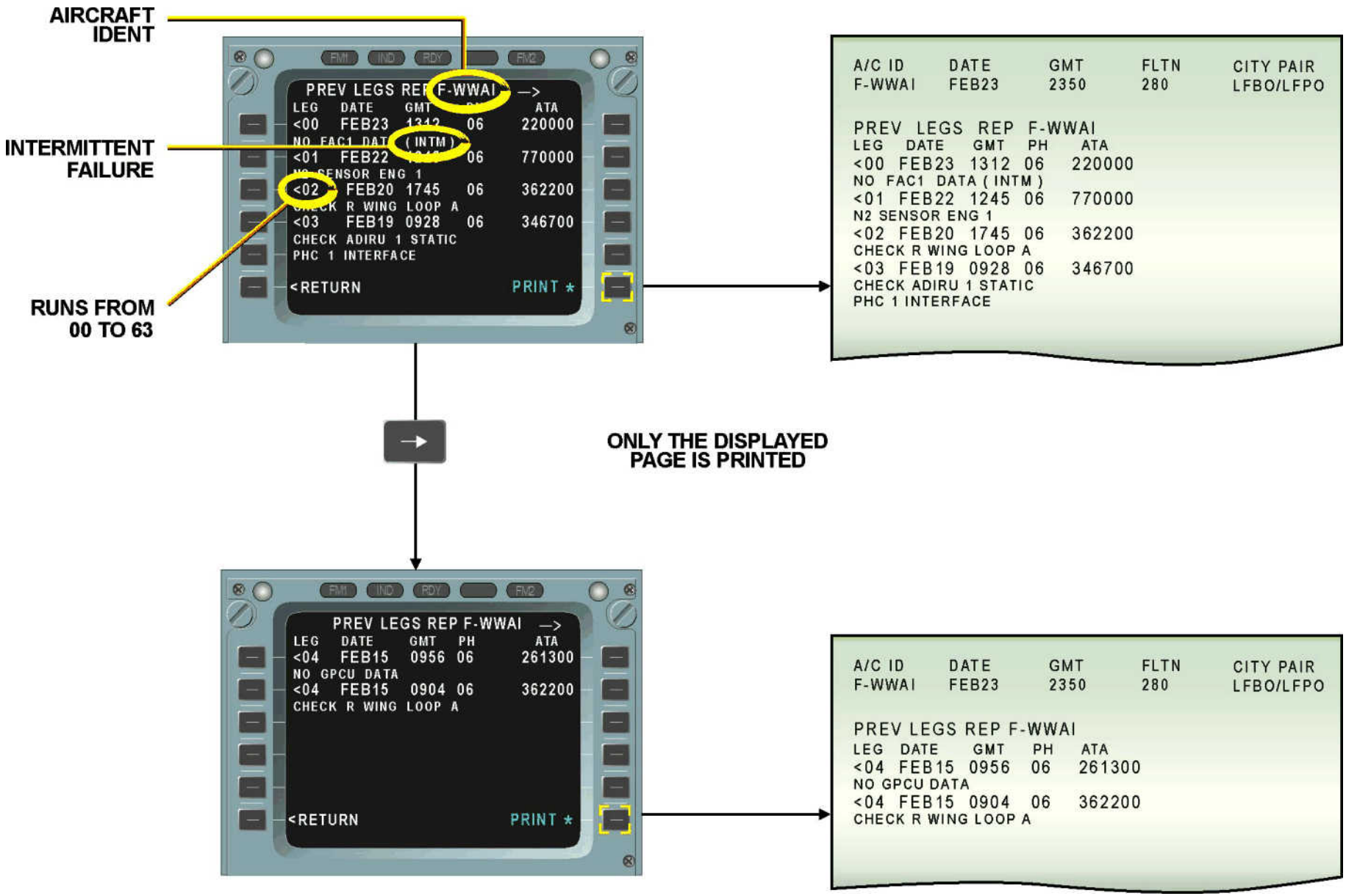


Figure 14 Previous Legs Report

CFDS REPORTS (AV STS) TROUBLESHOOTING

AVIONICS STATUS

The AVIONICS STATUS presents the list of systems which are **currently affected by a failure**.

This function is only available on ground.

The information presented is permanently updated.

The message contains the name of the systems presently affected by a failure, i.e. VHF 3, or a NO X DATA message when the related system X bus is not active, i.e. NO ILS 2 DATA.

The AVIONICS STATUS also indicates the class 3 failures.

(Class 3) means that the system is affected by at least one class 3 failure.

Note that there could also be class 1 or 2 failures.

When you make a print, all the AVIONICS STATUS report is printed even if it contains several pages.

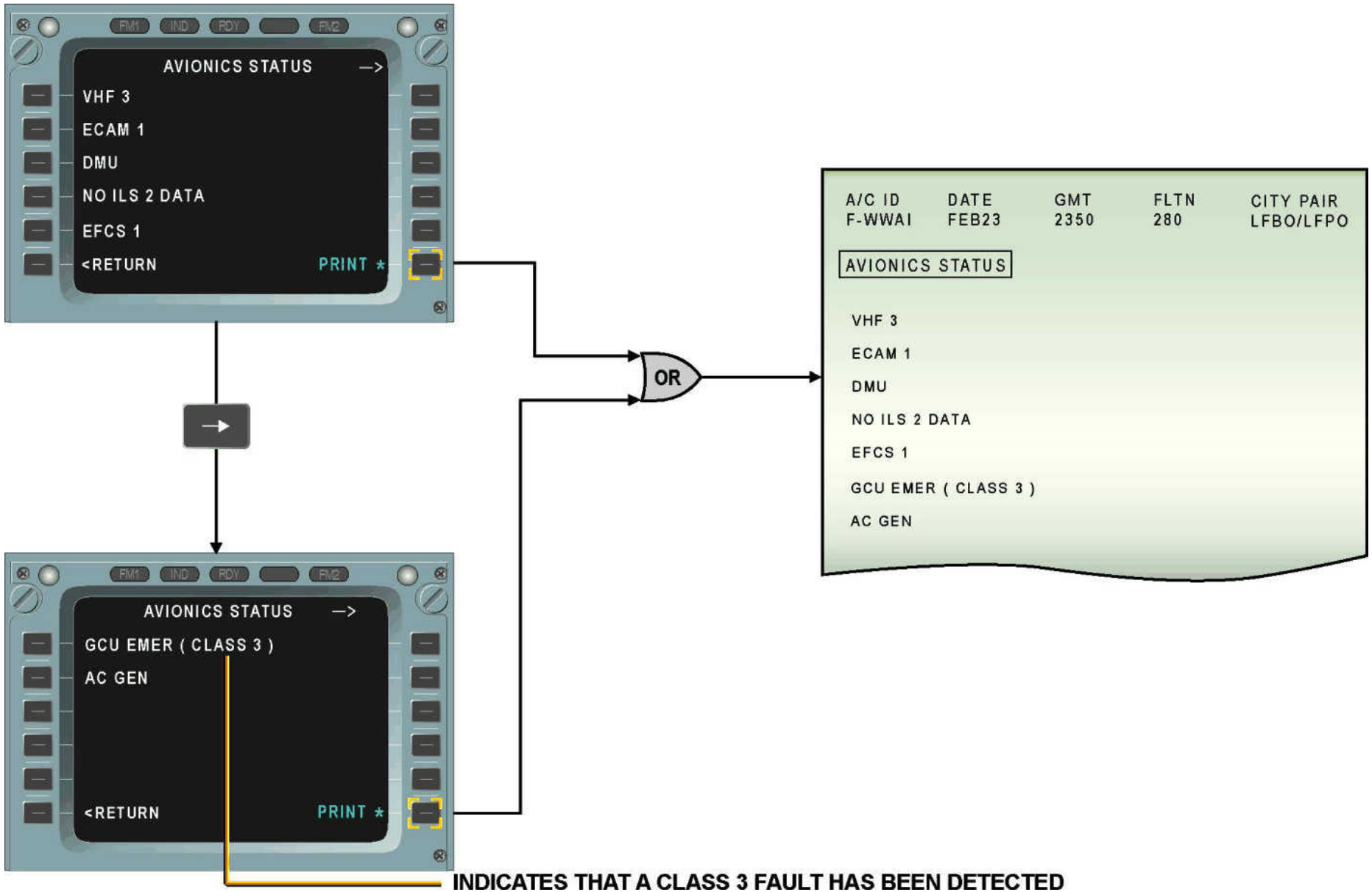


Figure 15 Avionics Status

CFDS REPORTS (SYS REP/TEST) PRESENTATION

SYSTEM REPORT/TEST

General

The SYSTEM REPORT/TEST function is available on the ground only.

It enables a dialogue between the CFDS and one system computer.

The SYSTEM REPORT/TEST menu presents the list of all the systems connected to the Centralized Fault Display Interface Unit, in ATA chapter order.

An example for each system type is available:

- in L/G for type 1 systems
- in AIR COND for type 2 systems
- in ELEC for type 3 systems

SYSTEM REPORT/TEST–BSCU A (Type 1 system)

Type 1 systems are the most common systems.

The menu they present depends on the system itself. In the MENU mode, the menu is transmitted by the system itself. You talk directly with the system.

The menu includes three basic functions:

- the LAST LEG REPORT
- the PREVIOUS LEGS REPORT
- the LRU IDENTIFICATION

and optional functions, depending on the system, for example:

- TROUBLE SHOOTING DATA
- CLASS 3 FAULTS
- TEST
- GROUND SCANNING and many more.

LAST LEG REPORT

This function presents the internal and external failure messages concerning this system that appeared during the last flight. These failure messages contain the name of the failed Line Replaceable Unit (LRU) associated with the time at which the failure occurred and the ATA reference.

PREVIOUS LEGS REPORT

This function presents the internal and external failure messages concerning this system that appeared during the previous 64 flights.

The failure messages contain the name of the failed LRU associated with the time and date at which the failure occurred, the flight number (–00 to –63) and the ATA reference.

LRU IDENTIFICATION

This function presents the Part Number (PN) of the system LRUs. On certain systems also the partnumber of the software will be indicated.

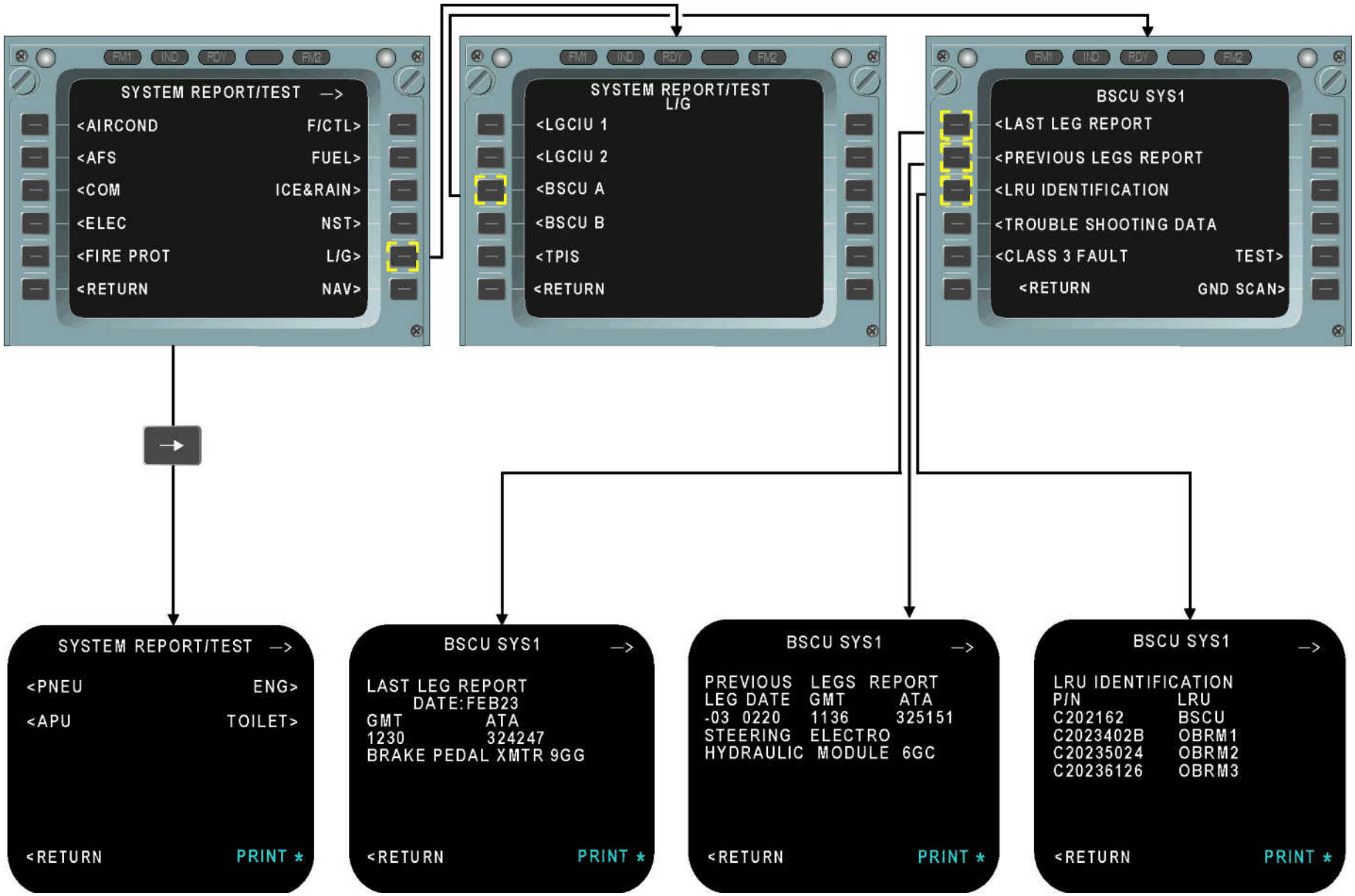


Figure 16 System Report/Test

CFDS REPORTS (MENU TYPES) PRESENTATION

TROUBLE SHOOTING DATA

SYSTEM REPORT/TEST–BSCU SYS1 (Type 1 system)

This item presents complementary information concerning the failures for trouble shooting at level 3 (engineering maintenance). These messages contain data constituting a snapshot of the system environment at the moment of the failure or contain parameters internal to the computer (Aircraft configuration, valve positions,...).

This information is presented on MCDU in hexadecimal language. When required, the TSM (**T**rouble **S**hooting **M**anual) gives the interpretation of the message.

CLASS 3 faults

This item presents class 3 failure messages concerning this system that appeared during previous flights. These failure messages contain the name of the equipment affected by a class 3 fault associated with the time, the date, the flight number and the ATA reference.

TEST

This item initiates system tests and shows the test results on the MCDU. The CFDIU transmits the code of the line key (TEST) to the system. The system BITE executes its test and may display a wait message to the CFDIU when the test lasts for a long time. At the end of the test, the BITE transmits the test results to the CFDIU for display.

GROUND SCANNING

This item presents the internal and external failures concerning this system and which are present when the request is made (on ground only).

This report is established by forcing the operation of the BITE in system normal mode (same BITE operation as in flight).

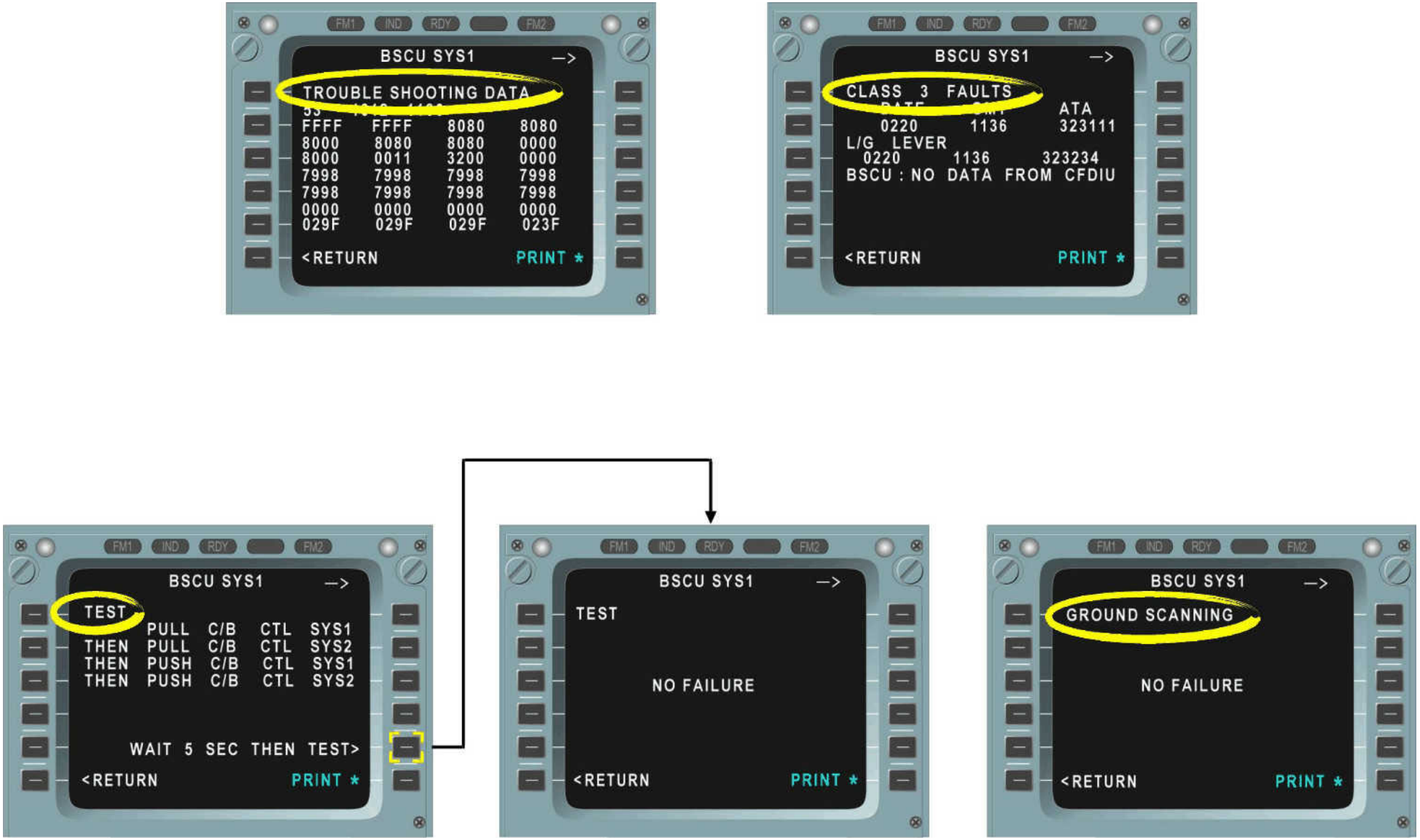


Figure 17 System Report/Test - BSCU SYS1 (Type 1 System)

SYSTEM REPORT/TEST–AEVC (TYPE 2 SYSTEM)

Type 2 systems present a menu with one basic function, the LAST LEG REPORT and optional functions depending on the system.

Unlike Type 1 systems, Type 2 systems do not have a Menu Mode.

These functions are presented on the MCDU **by the CFDIU**:

- You are in PSEUDO–MENU mode. You do not talk directly to the system.
- The system permanently transmits its data on the system bus, and the CFDIU reads them, except for the test.

The menu includes one basic function:

- the LAST LEG REPORT,

and optional functions depending on the system, for example here

- TEST,
- CLASS 3 FAULTS.

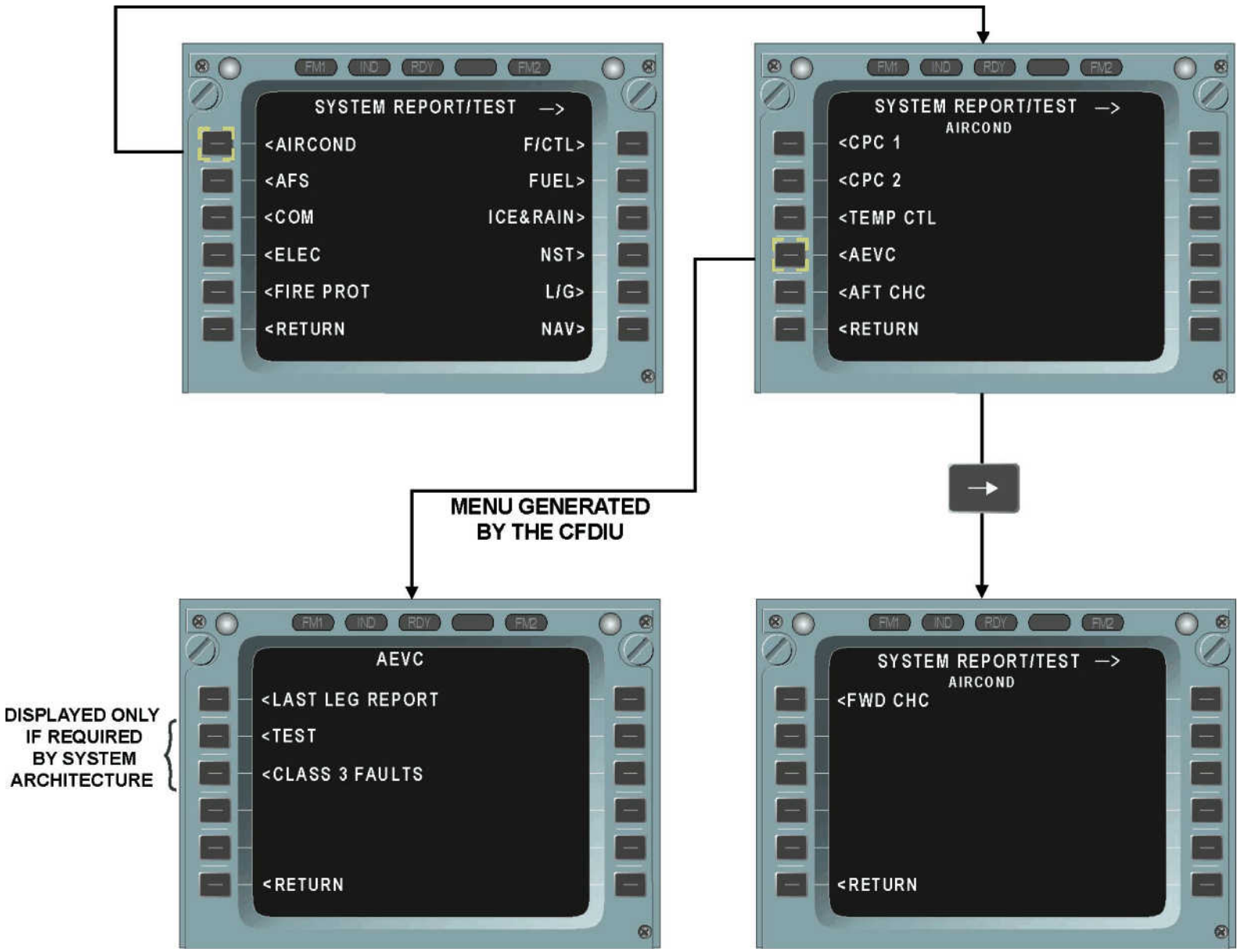


Figure 18 System Report/Test–AEVC (Type 2 System)

SYSTEM REPORT/TEST–GCU EMER (TYPE 3 SYSTEM)

Type 3 systems present only one function on their menu. Type 3 systems have no MENU mode.

The available functions are shown by the CFDIU.

The only possible functions are TEST or RESET. When you make a test or a reset, the CFDIU initiates the test or the reset, receives the result and shows it on the MCDU.

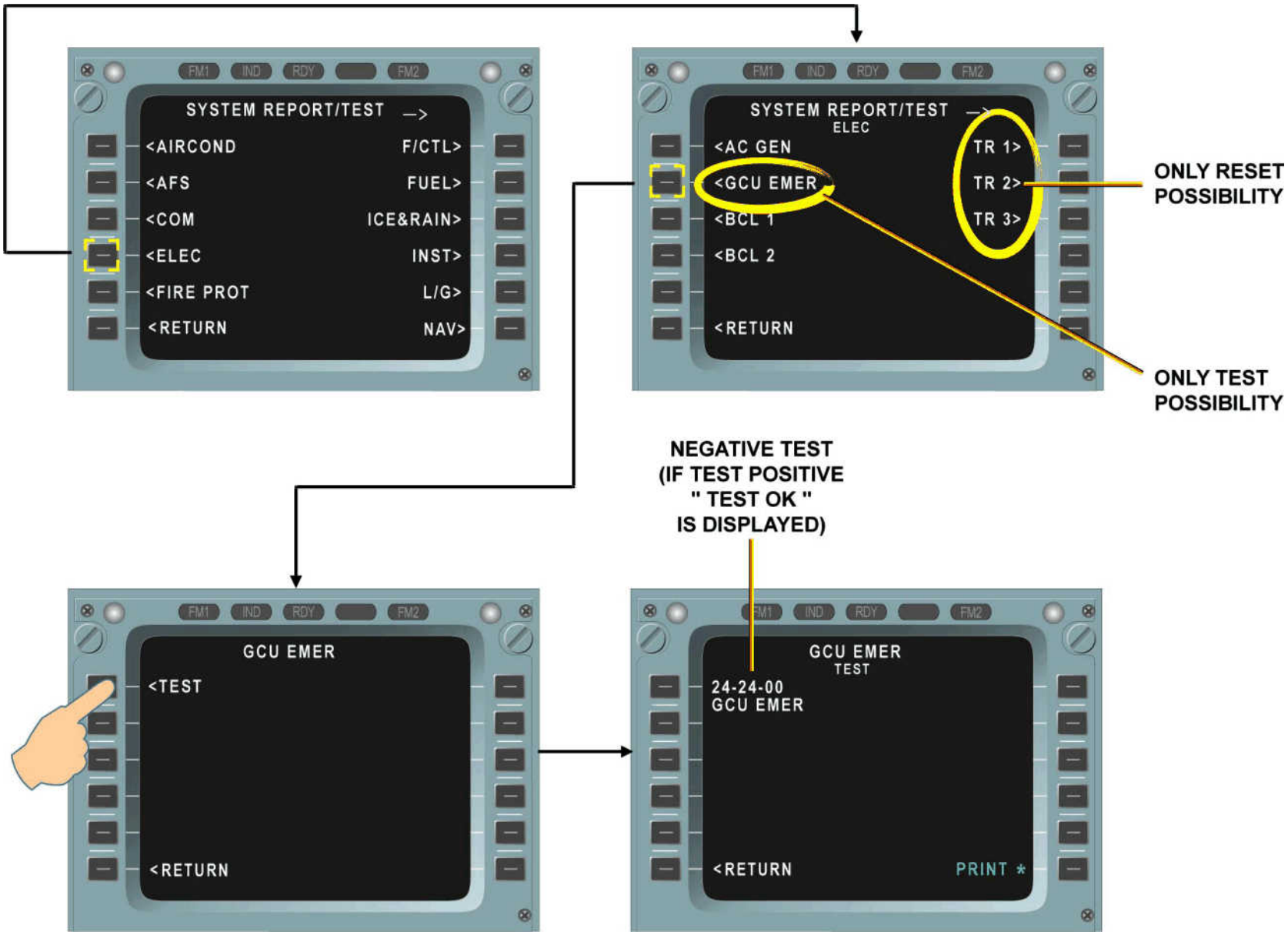


Figure 19 System Report/Test–GCU EMER (Type 3 System)

CFDS REPORTS (PFR) INTRODUCTION

PFR (POST FLIGHT REPORT)

The POST FLIGHT REPORT is the sum of the LAST LEG REPORT and of the LAST LEG ECAM REPORT.

It is only available on the printer.

- “ECAM WARNING MESSAGES“ or “ECAM WARNING/MAINT. STATUS MESSAGES MESSAGES“ display the LAST LEG ECAM REPORT.
- FAILURE MESSAGES display the LAST LEG REPORT.
- DB/N indicates if and which a PFR filter database is active.

You can send this report to the ACARS.

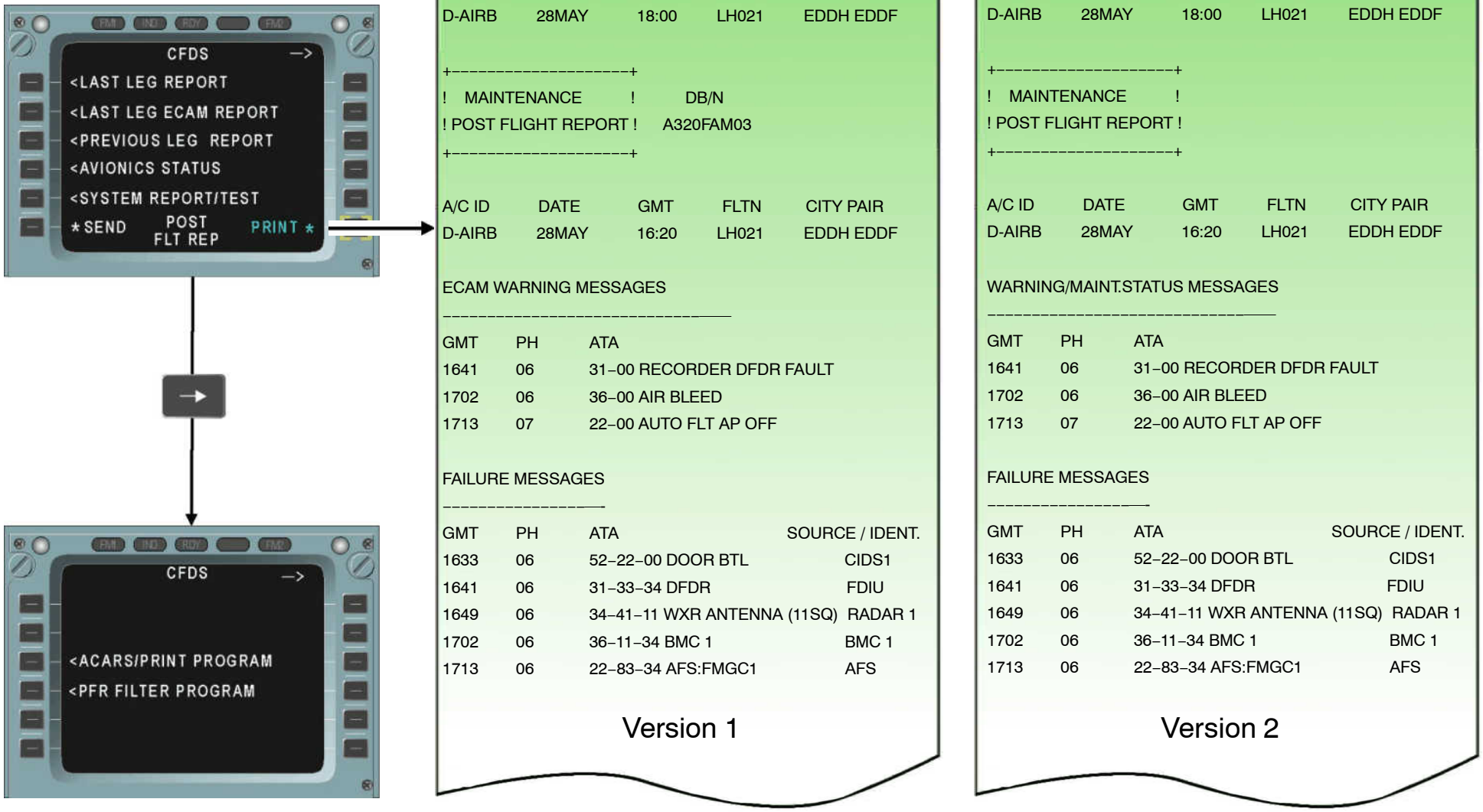


Figure 20 Post Flight Report

GMT/DATE INITIALIZATION OPERATION

The GMT/DATE INITialization function is available only in case of clock failure plus CFDIU power interrupt.

The Centralized Fault Display System permits to reinitialize the time and the date on the multipurpose control and display unit.

GMT (UTC) and date are entered using the scratchpad.

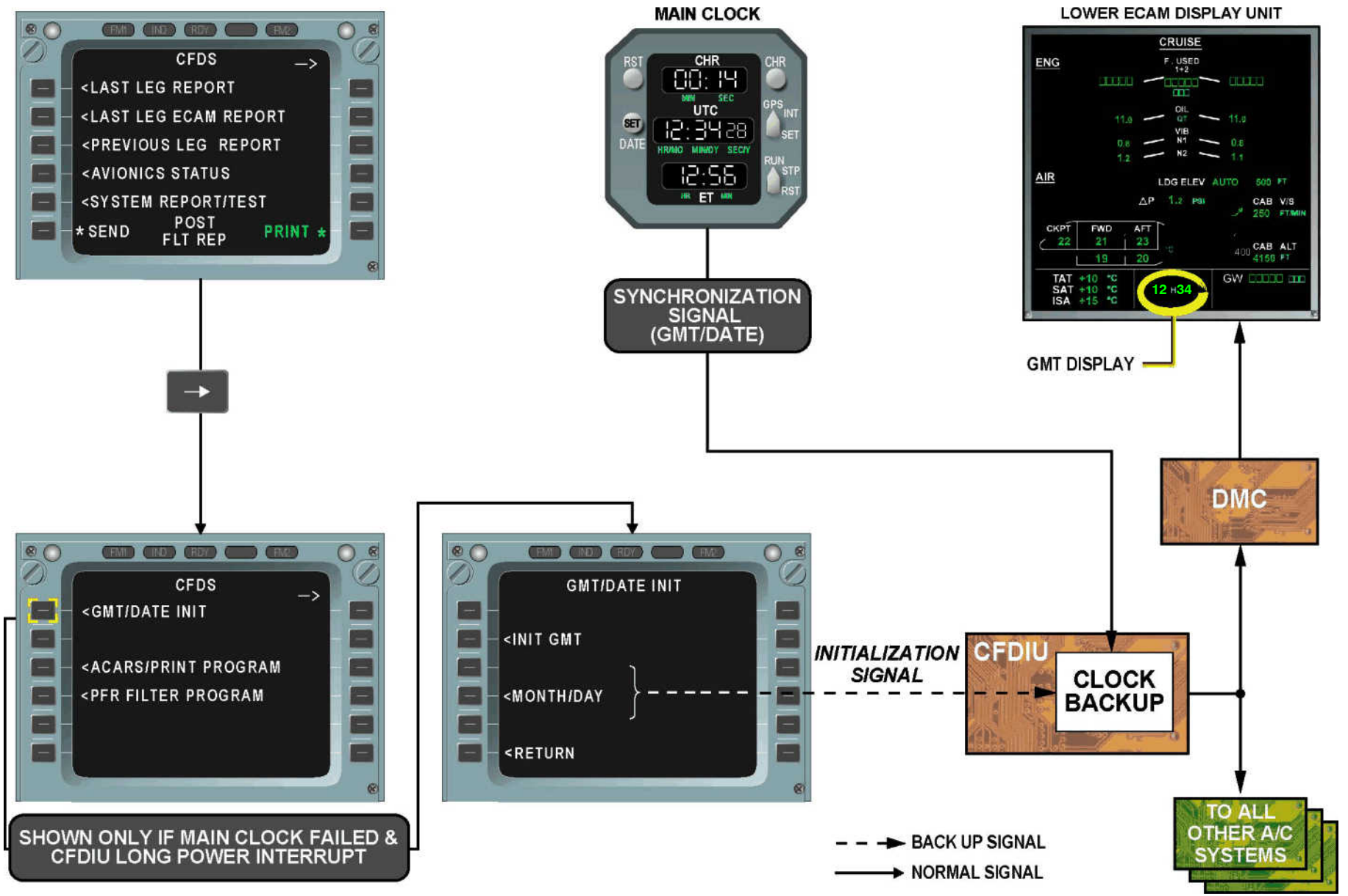


Figure 21 GMT/Date Initialization

ACARS/ PRINT PROGRAM OPERATION

An ACARS/PRINT PROGRAM function is available.

It enables programming of the CFDS reports transmission to the ACARS and to the printer.

The functions written in green are delivered by the ACARS or the CFDIU.

They cannot be modified by the flight crew.

The functions written in blue can be changed manually.

If you select one of these functions, you will switch the YES message to NO and vice versa.

The **REAL TIME FAILURES** provide, in real time, all the internal failure messages delivered by the systems or created by the CFDIU (CURRENT LEG REPORT DATA).

When the associated SEND is on YES, this data is automatically transmitted to the ACARS, in real time.

The **REAL TIME WARNINGS** function provides, in real time, warning messages, sent by the Flight Warning Computers (CURRENT LEG ECAM REPORT DATA).

When the associated SEND is on YES, the report is automatically transmitted in real time, to the ACARS.

The **POST FLIGHT REPORT** is the sum of the LAST LEG REPORT and of the LAST LEG ECAM REPORT.

When the associated SEND is on YES, the POST FLIGHT REPORT will be automatically transmitted to the ACARS at the end of the flight (transition from flight phase 9 to 10).

The PRINT function associated to

- the POST FLIGHT REPORT
- the REAL TIME FAILURES
- the REAL TIME WARNINGS

permits an automatic print of the report.

The POST FLIGHT REPORT will be printed automatically at transition from flight phase 9 to 10 (Second engine shutdown).

Upon power on, the last selected programmed functions are still present.

At the initialization, the manual programming functions present the last configuration in vigor.

The **AVIONICS DATA** function enables to send and/or print system pages available in the SYSTEM REPORT/TEST menu.

The printing or/and sending is not automatic; you must select the print line key displayed in the system page.

NOTE: In the system pages, the PRINT message cannot be modified.

But when you print and send the system pages, the ”PRINT ALSO SEND” message appears in the scratchpad. The ALL reports which are printed manually are also send automatically via ACARS.

Functions delivered by the ACARS:

When the CFDIU has not received any programming from the ACARS, the YES or NO message is replaced by a blank.

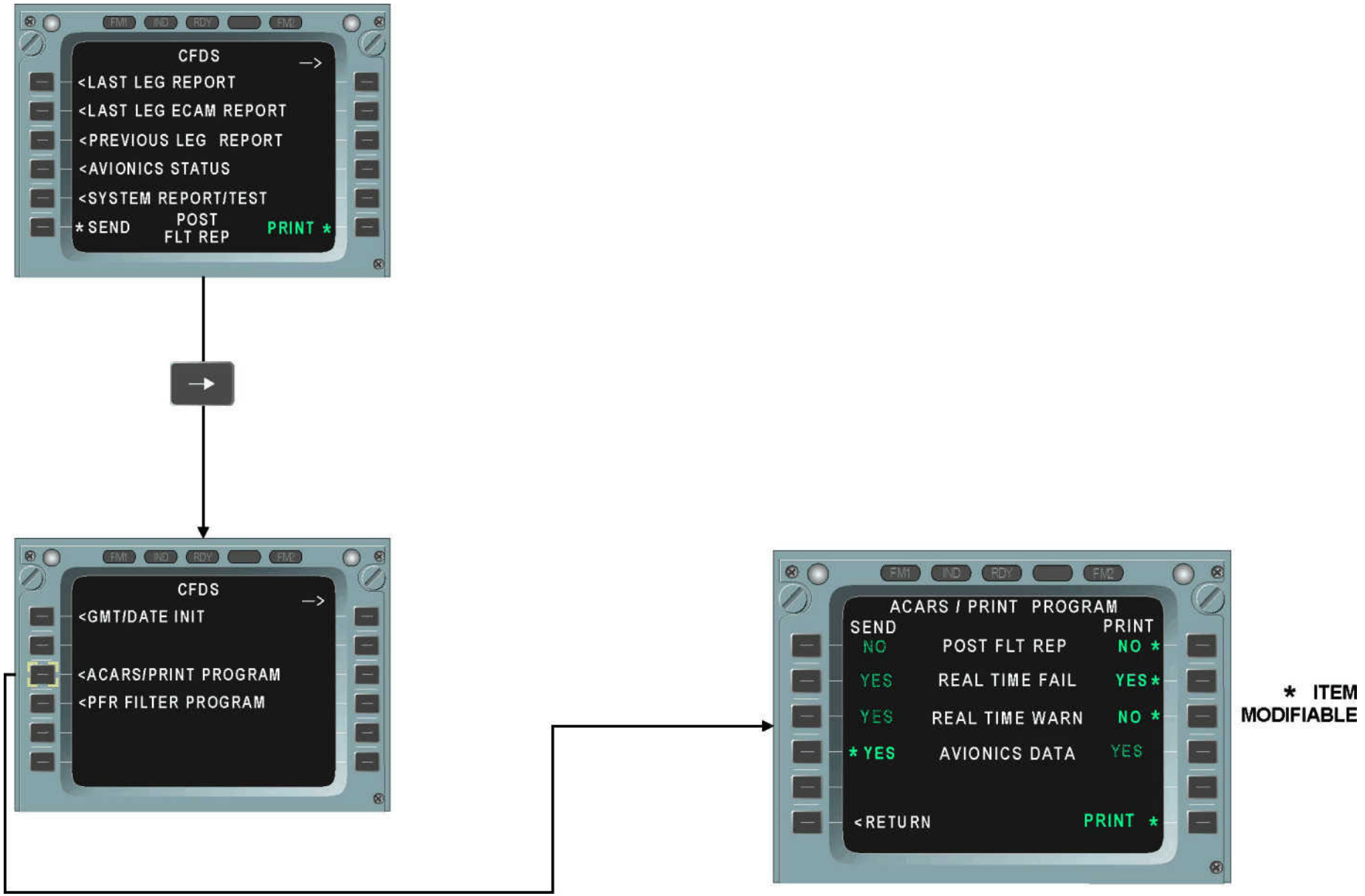


Figure 22 ACARS/Print Program

CFDS PFR FILTER PROGRAM-MAINTENANCE PRACTICES

PFR FILTER PROGRAM

The purpose of this function is to improve the operational use of the PFR, CURRENT/LAST LEG ECAM REPORT and LAST LEG REPORT, by filtering all the spurious or unjustified failures/messages. It concerns the PFR printed at the end of the flight as well as the real–time failure and warning information transmitted by the ATSU.

FILTER ACTIVATED

The filter database is activated after correct uploading. It can be deactivated then activated again through the second page of the main maintenance menu by pushing line key 4L then 2L. This database is adapted from SIL (**S**ervice **I**nformation **L**etter) 0028 under diskette form. It must be periodically updated.

PRINT FILTER CONTENT

Action on line key 3R starts the printing of the maintenance filter database.

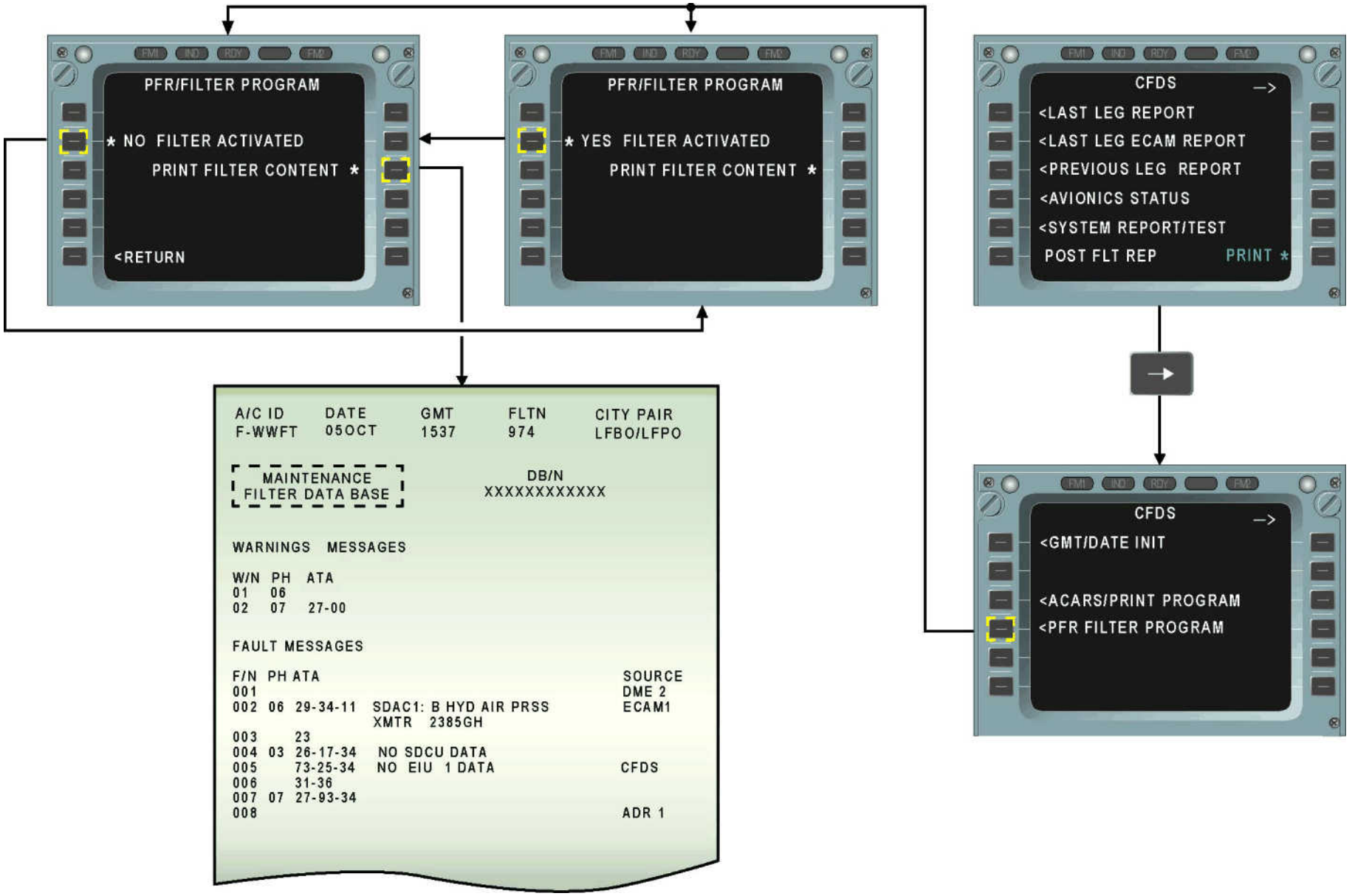


Figure 23 PFR Filter Program – Filter Activated & Print Filter Content

PFR FILTERING FUNCTION MAINTENANCE PRACTICES

PURPOSE

The purpose of the filtering function is to reduce the number of spurious maintenance messages. So the filtered PFR (**P**ost **F**light **R**eport) contains only the messages needing a maintenance action.

FILTER DATA BASE CUSTOMIZATION AND LOADING

Using the feedback data from the airlines or the data from laboratory or flight tests, Airbus establishes, keeps up to date and transmits to the airlines a document called SIL (**S**ervice **I**nformation **L**etter) 00–028. SIL 00–028 consists of a ”spurious maintenance messages data base”.

This is an envelope data base, including the spurious messages concerning every possible PN (**P**art **N**umber) from every vendor. The airline is responsible for customizing this envelope data base to its fleet configuration using a compatible personal computer and dedicated software.

The customized maintenance filter data base is first stored on a floppy disk, and then uploaded into the CFDIU (**C**entralized **F**ault **D**isplay **I**nterface **U**nit) by means of the data loader.

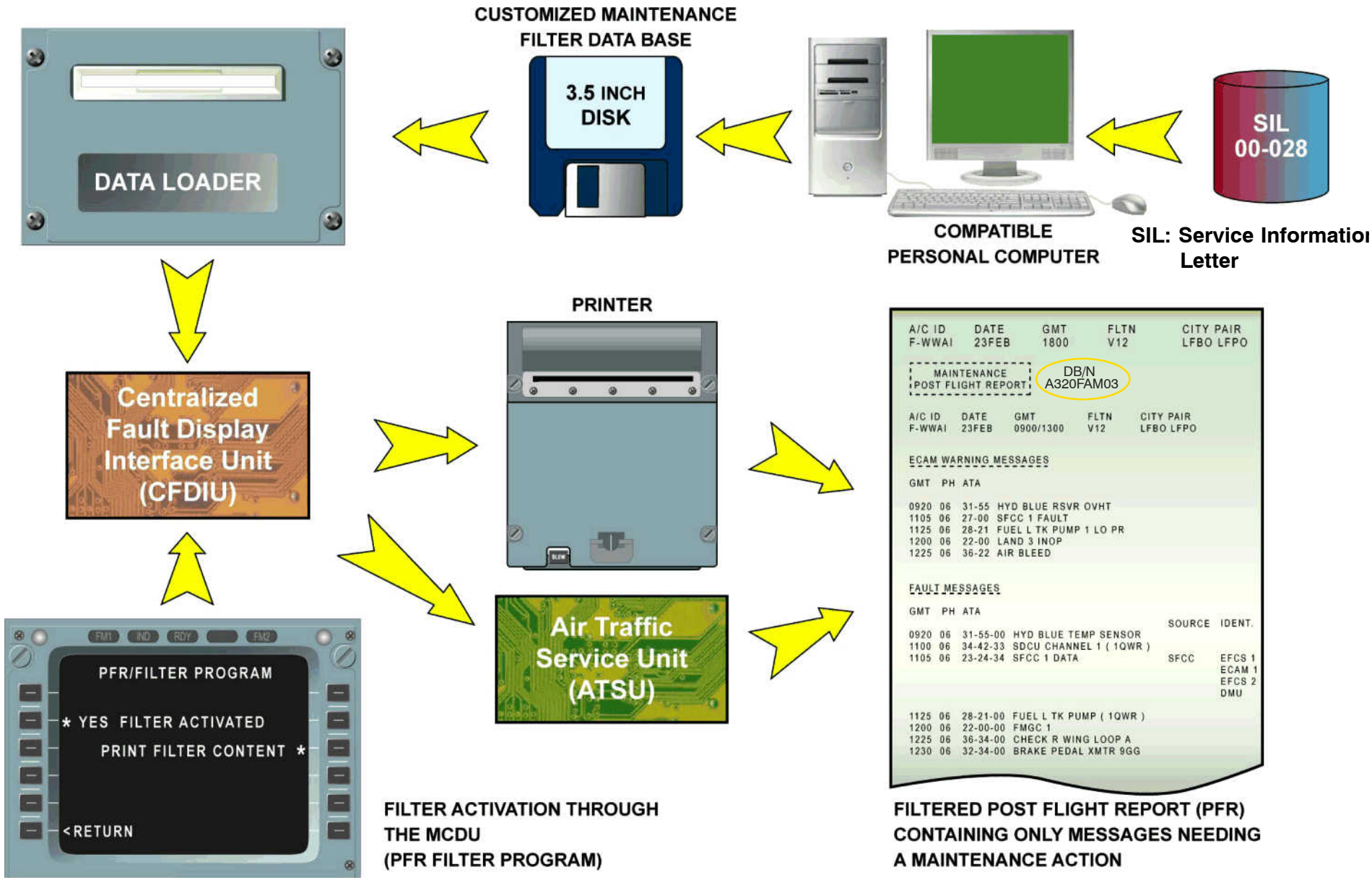


Figure 24 Purpose & Filter Data Base Customization and Loading

PFR FUNCTION (INDICATION) OPERATION

FILTER DATA BASE IDENTIFICATION

Each filter is identified by a 15–character data base number. The data base number is written on the filtered PFR and can be displayed on the MCDU.

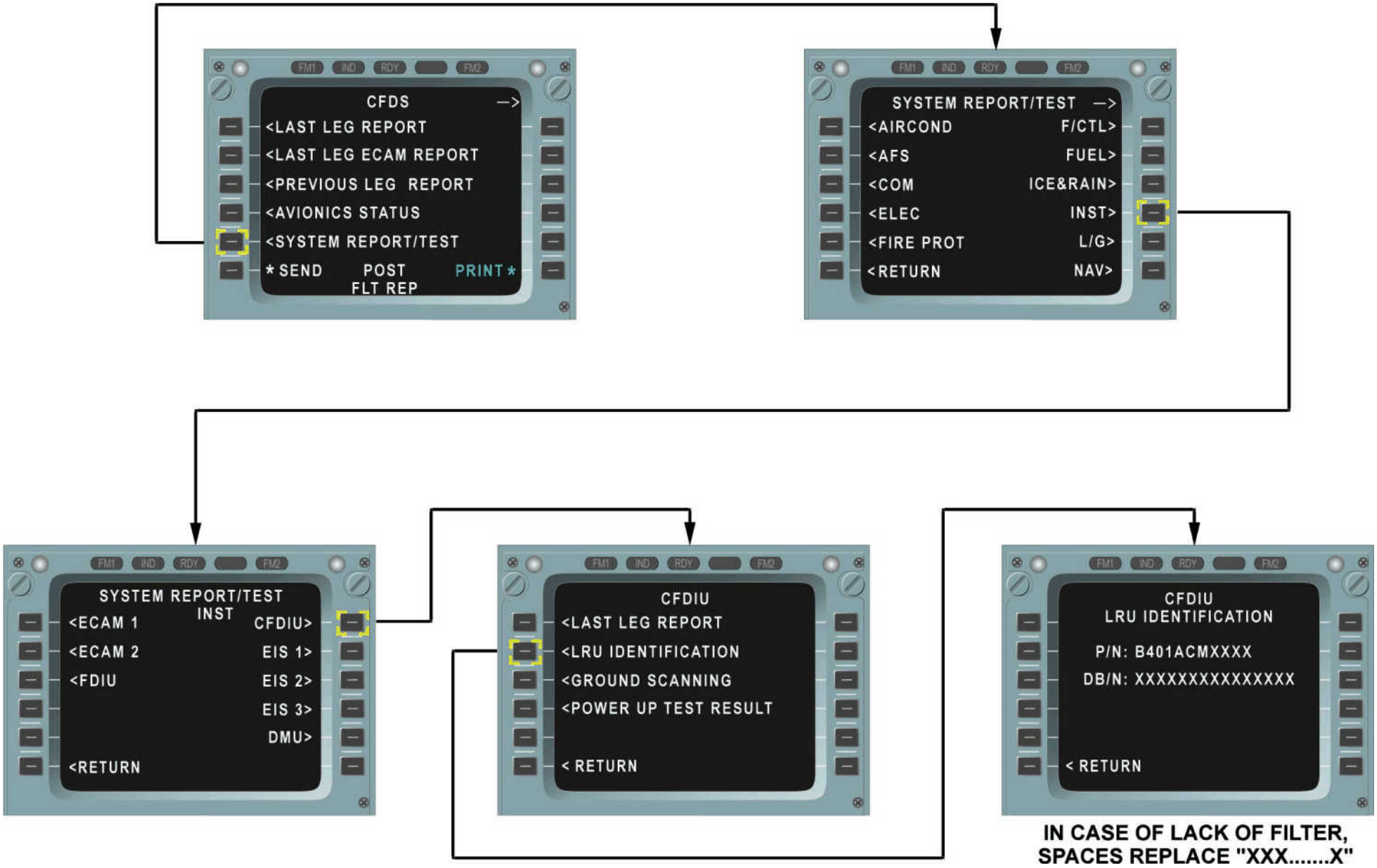


Figure 25 Filter Data Base Identification

POST FLIGHT REPORT FILTERING FUNCTION (EXAMPLE)

EXAMPLES

These examples show a PFR not filtered, the maintenance filter data base and the PFR filtered.

MAINTENATCE FILTER DATA BASE

```
A/C ID      DATE      GMT      FLTN      CITY PAIR
D-AISU      28MAY     18:00    LH021     EDDH EDDF

+--------------------+
!     MAINTENANCE    !          DB/N
!  FILTER DATA BASE  !     DLH10 A320FAM
+--------------------+

WARNING MESSAGES
--------------------------------
W/N      PH       ATA
001      03       21–26 AIR PACK 1 2 FAULT
002      04       21–26 AIR PACK 1 2 FAULT
003      02       22–00 AUTO FLT AP OFF
004      03       22–00 AUTO FLT AP OFF
005      04       22–00 AUTO FLT AP OFF
006      08       22–00 AUTO FLT A/THR OFF
007      08       22–00 AUTO FLT AP OFF
008      09       22–00 AUTO FLT A/THR OFF
009      09       22–00 AUTO FLT AP OFF
010               27–00 F/CTL SPD BRK DISAGREE
011               32–00 BRAKES HOT

FAILURE MESSAGES
----------------
F/N      PH       ATA                              SOURCE
001               22–82–12 MCDU3(3CA3)/ATSU(1TX1)
002      02       23–73–00 DIR1 (101RH) /          CIDS 1
                           OBRM
003
```

NOT FILTERED PFR

```
A/C ID      DATE      GMT      FLTN      CITY PAIR
D-AISU      28MAY     18:00    LH021     EDDH EDDF

+--------------------+
!     MAINTENANCE    !
! POST FLIGHT REPORT !
+--------------------+

A/C ID      DATE      GMT      FLTN      CITY PAIR
D-AISU      28MAY     15:15/16:20 LH021  EDDH EDDF

WARNING/MAINT. STATUS MESSAGES
------------------------------
NO WARNING MESSAGE

FAILURE MESSAGES
----------------
GMT      PH       ATA
1555     02       23–73–00 DIR1 (101RH) /
                           OBRM
```

FILTERED PFR

```
A/C ID      DATE      GMT      FLTN      CITY PAIR
D-AISU      28MAY     18:00    LH021     EDDH EDDF

+--------------------+
!     MAINTENANCE    !          DB/N
! POST FLIGHT REPORT !     DLH10 320FAM
+--------------------+

A/C ID      DATE      GMT      FLTN      CITY PAIR
D-AISU      28MAY     5:15/16:20 LH021   EDDH EDDF

WARNING/MAINT. STATUS MESSAGES
------------------------------
NO WARNING MESSAGE

FAILURE MESSAGES
----------------
NO FAILURE MESSAGE
```

Figure 26 PFR Filter Example

BACKUP MODE (OPTION) OPERATION

BACKUP MODE GENERAL

The BACKUP MODE function is only displayed in case of CFDIU main channel failure.

It enables access to the functions of the backup channel.

In flight, no function is available.

On ground, the only function possible is SYSTEM REPORT/ TEST.

This function is available for the main systems only.

CFDS BACKUP MODES

First Back–up Mode

The CFDIU consists of two distinct channels: normal channel and back–up channel.

In normal operation, the normal channel of the CFDIU ensures all maintenance functions and the back–up channel is not energized.

In the event of a CFDIU normal channel fault:

- If this fault is serious (power supply board or micro):

  it is automatically and immediately switched to the CFDIU back–up channel. In addition, the back–up channel is power supplied on the ground only (ground/flight discrete). When the CFDS item is selected in the MCDU MENU, the CFDS BACKUP MODE page is directly displayed on the MCDU.

  In flight: No functions are possible (not supplied).

  On the ground: The only function possible is the SYSTEM REPORT/TEST function, for the aircraft main systems only.

- If the fault in the CFDIU normal channel is not serious (interface board), automatic switching is not performed, so as not to lose the other CFDS functions for the systems not affected by the fault.

  However, the CFDS may add a BACKUP MODE item in its menu, on the ground only, enabling manual switching to the back–up channel on the MCDU. This switching gives the operator access to the systems affected by the fault in the normal channel. When the switching has been performed by the operator, the CFDIU is placed in the previous configuration (automatic switching).

  Note: Only the MCDU1 or 3 is connected to the CFDIU back–up channel and can alone be used in BACKUP MODE.

  After switching to the back–up channel (automatic or manual), return to the normal channel is not possible using the MCDU. The return can only be performed after a CFDIU power cutoff longer than 1 second.

  A CFDIU fault is indicated by a class 2 warning to the ECAM.

Second CFDS Back–up Mode: the test Plugs

In the event of total CFDIU failure (normal and back–up channels), it is still possible to read the maintenance information sent by certain systems by means of two test plugs located in the avionics compartment, on either side of rack 80VU.

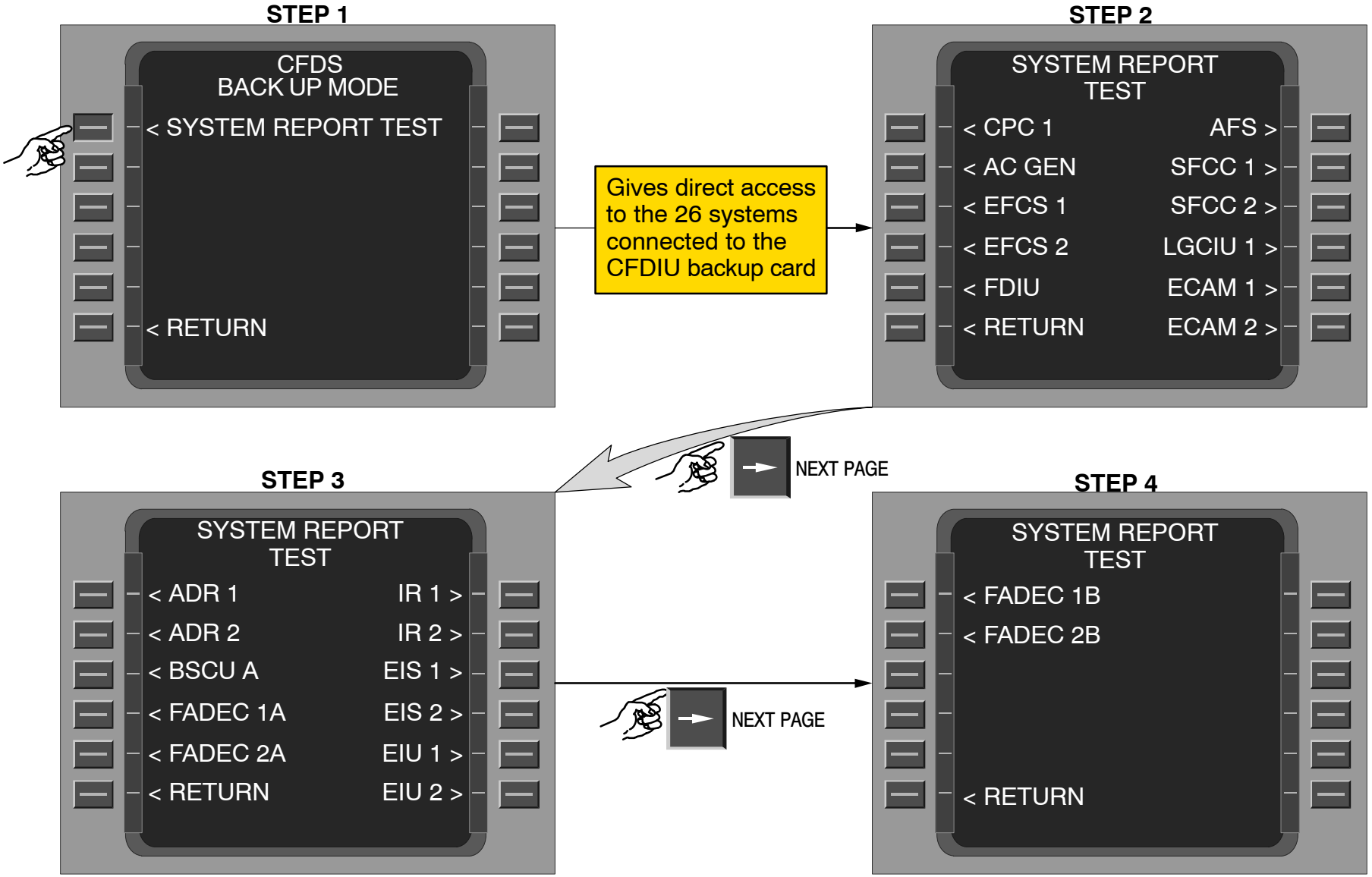


Figure 27 Backup Mode (OPTION)

PASSWORD CHANGE (OPTION) OPERATION

CFDS Password Settings

The purpose of this function is to enable customized access to REPORTS PROGRAMMING and PFR FILTER PROGRAM pages through a password.

Two modes can be used:

- **Transparent mode:** free access
- **Password mode:** access through a password

  The operator can exit the transparent mode to use the password mode and vice versa.
- the transparent mode is active at component delivery.
- the password is made up of the character minimum and eight characters maximum. The ninth character becomes the eighth character.
- password XXXXXXXX is dedicated to the transparent mode.
- when changing the password:
  - OK means ”password corrected and accepted”
  - ERROR means ”not OK”
- The three fields LAST PASSWORD, NEW PASSWORD and CONFIRM PASSWORD must be correctly filled in (i.e. three OK indications) to validate the new password.

  When the password entered cannot be validated, the ERROR message is displayed in the scratchpad.

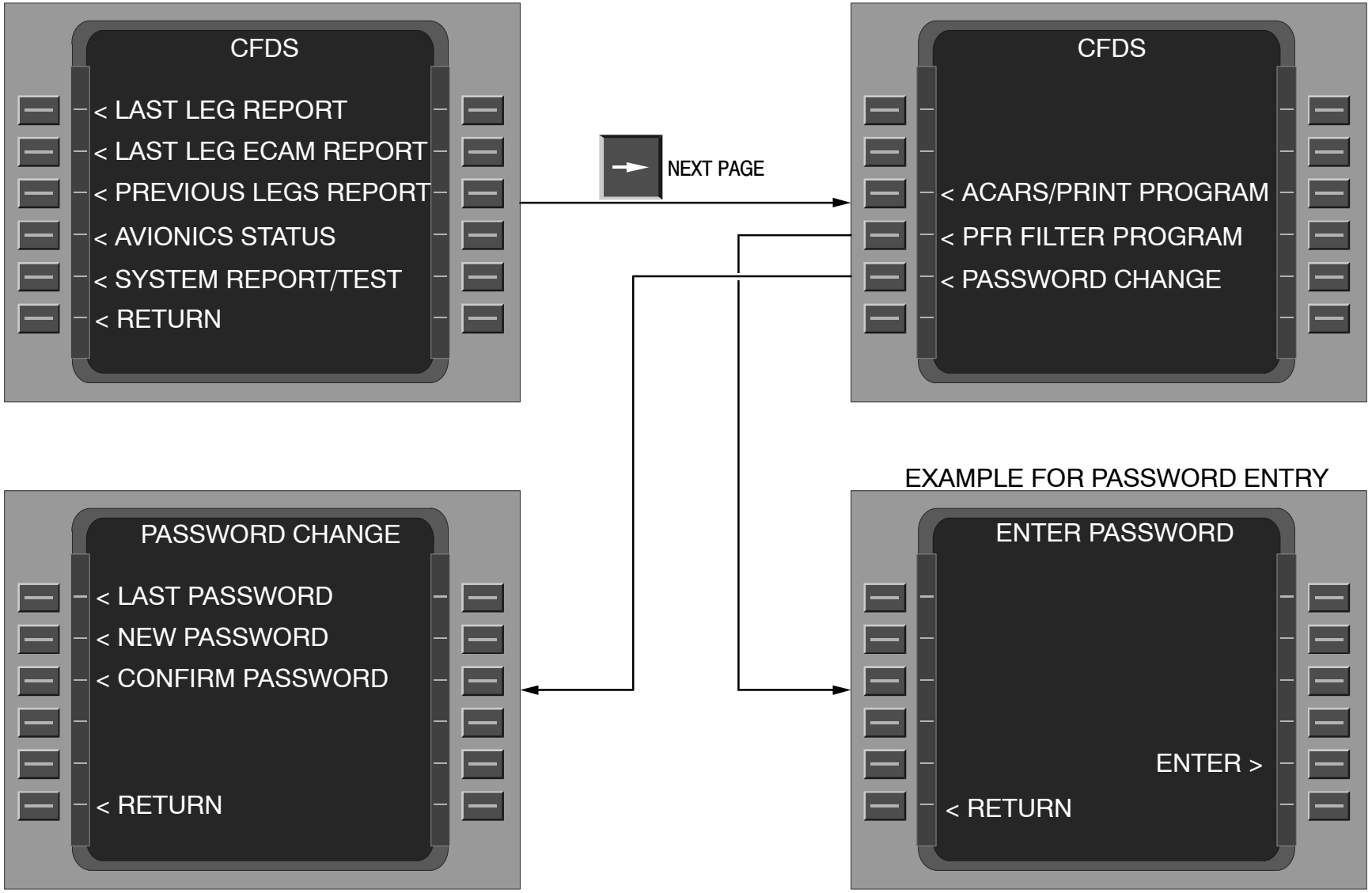


Figure 28 PASSWORD SETTINGS (OPTION)

CFDS PHASES FUNCTIONAL OPERATION

GROUND/FLIGHT TRANSITION

Transition to flight (Event 1) is defined at the soonest or at the latest depending on whether the flight number has been entered by the crew before take–off or not:

- at the soonest: First engine start + 3 minutes if flight number entered prior to first engine start.
- at the latest: Aircraft speed > 80 knots if flight number not entered prior to first engine start.

At event ”1”, the leg number is incremented.

IN FLIGHT PHASE

From event 1 until aircraft speed has been below 80 knots for 30 seconds, type 1 and 3 systems are considered in flight.

NOTE: Type 2 systems are only considered in flight from 30 seconds after lift off up to touch down.

In flight, the system BITE (**B**uilt–**I**n **T**est **E**quipment)ensures:

- detection (Type 1/2/3 systems) and memorization in their flight memory (Type 1/2 systems only, as type 3 system BITEs do not have any memory) of internal and external faults,
- transmission to the CFDIU (**C**entralized **F**ault **D**isplay **I**nterface **U**nit) of internal and external faults for memorization and establishment of the CURRENT LEG REPORT.

This in flight phase corresponds to the PFR (**P**ost **F**light **R**eport) recording time (Beginning and end of fault and ECAM (**E**lectronic **C**entralized **A**ircraft **M**onitoring) warning message memorization in the CFDIU.

FLIGHT/GROUND TRANSITION

Transition to ground occurs when, after touch down, the aircraft speed has been below 80 knots for 30 seconds. At this time, the CURRENT LEG REPORT is renamed under the title LAST LEG REPORT and is stored in the PREVIOUS LEGS REPORT.

NOTE: As the leg has not changed, the content of the LAST LEG REPORT is identified in the PREVIOUS LEGS REPORT under the LEG –00.

ON GROUND PHASE

On ground, the system BITEs ensure:

- detection (Type 1/2/3 systems) and memorization in their ground memory (Type 1/2 systems) of internal faults only,
- transmission to the CFDIU of internal faults for monitoring and establishment of the AVIONICS STATUS.

All CFDS (**C**entralized **F**ault **D**isplay **S**ystem) functions (e.g. PFR printing) are available on request through the MCDUs.

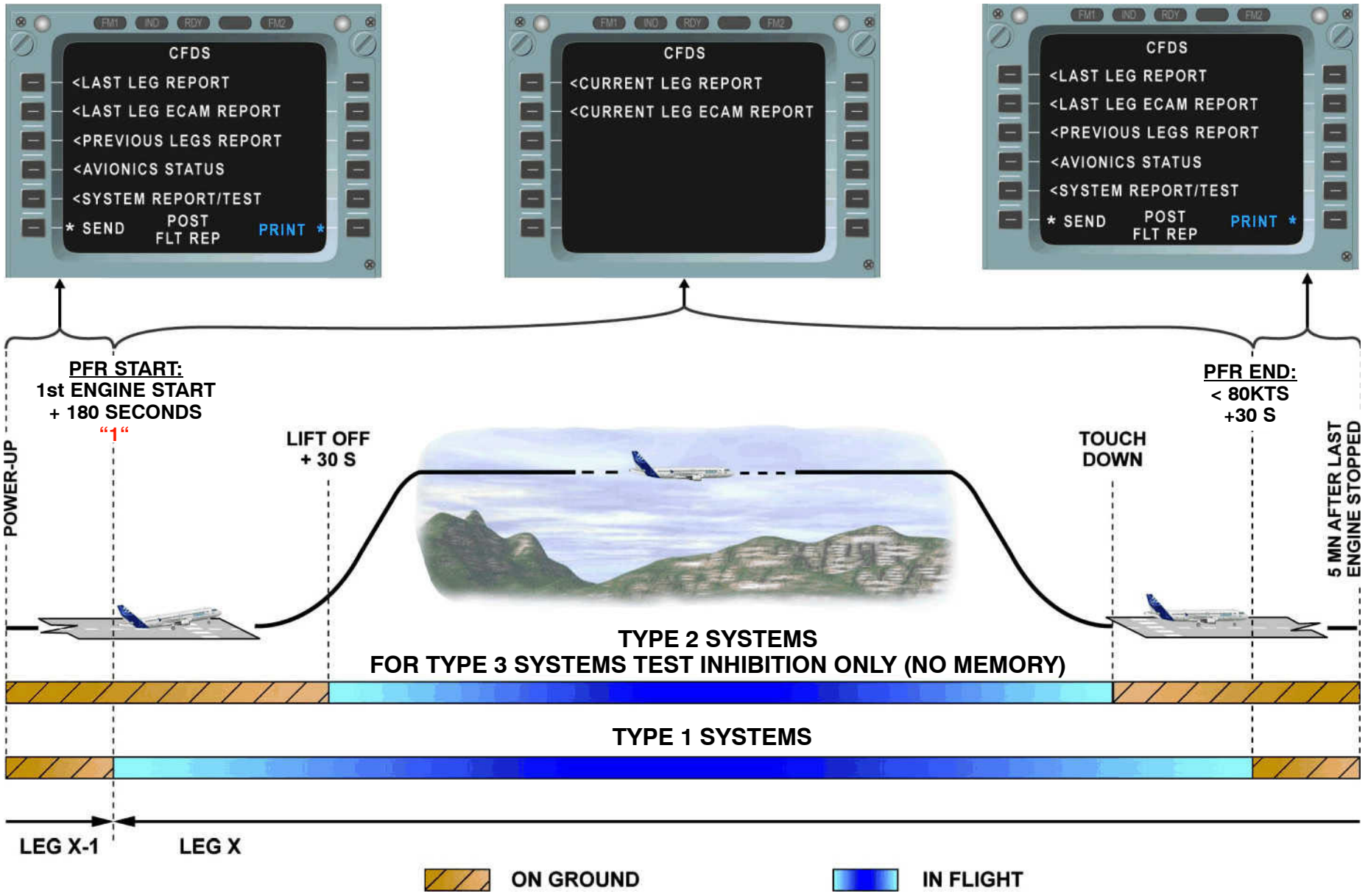


Figure 29 Ground/Flight Transition

CFDIU FUNCTIONS

MAIN FUNCTIONS

Memory

The CFDIU stores the failure messages and the ECAM warning messages in a non volatile memory.

Management

The CFDIU manages failure information and adds data such as GMT, DATE, LEG, FLIGHT PHASE to elaborate reports.

Correlation

If a computer internal failure is detected, the CFDIU achieves a correlation function that means it isolates or ignores the malfunctions of systems relating to this failure.

Example: ”ADC FAILURE” causes ”NO DATA FROM ADC” in other computers.

The CFDS will present only the initial failure in the last leg report.

The function ”IDENT” will then present the systems affected by this failure.

Monitoring

The CFDIU scans permanently all input buses in order to detect a transmitted failure message.

The CFDIU detects intermittent operation of the systems and adds (INTM) to the failure message.

Detection

The CFDIU can detect the nature of the failure by reading the ARINC words.

Nature of failures:

- Internal Example: ”SDAC FAULT”
- External Example: ”FWC1: NO DATA FROM ADIRU1”
- Intermittent (INTM) added
- Class 3 (CLASS 3) added
- Messages requiring more investigation with the help of the trouble–shooting manual Example: ”CHECK EIU 1”

INTERFACES

Clock

The CFDIU permanently receives the GMT (UTC) and the date from the aircraft clock and then sends these two parameters to all type 1 systems.

The GMT and date are used by the system BITE’s as well as the CFDIU for the various maintenance reports.

FAC (Flight Augmentation Computer)

The CFDIU receives the flight number and city pair from the FAC.

The city pair (FROM/TO airports) is sent to the MU (**M**anagement **U**nit) of the ACARS (**A**ircraft **C**ommunication **A**ddressing and **R**eporting **S**ystem) and to the DMU (**D**ata **M**anagement **U**nit) of the AIDS (**A**ircraft **I**ntegrated **D**ata **S**ystem).

FDIU (Flight Data Interface Unit, part of Flight Recorder System)

The CFDIU receives the aircraft identification from the Flight Data Interface Unit and sends this parameter to all type 1 systems.

The CFDIU is used as an interface between the FDIU and the FWC (Flight Warning Computer) to send some FDIU class 2 failures to the FWC in order to constitute the maintenance status.

FWC (Flight Warning Computer, part of ECAM)

The CFDIU receives the flight phases and ECAM warnings from the FWC.

The ECAM warnings are used by the CFDIU to generate the LAST or CURRENT LEG ECAM REPORT.

Only PRIMARY failures, INDEPENDENT failures and CLASS 2 failure messages (Maintenance status) are received.

DMU (Data Management Unit, part of AIDS)

The CFDIU is used as an interface between the DMU and the FWC to send some DMU class 2 failures.

DMU class 2 failures are used for the maintenance status on the ECAM.

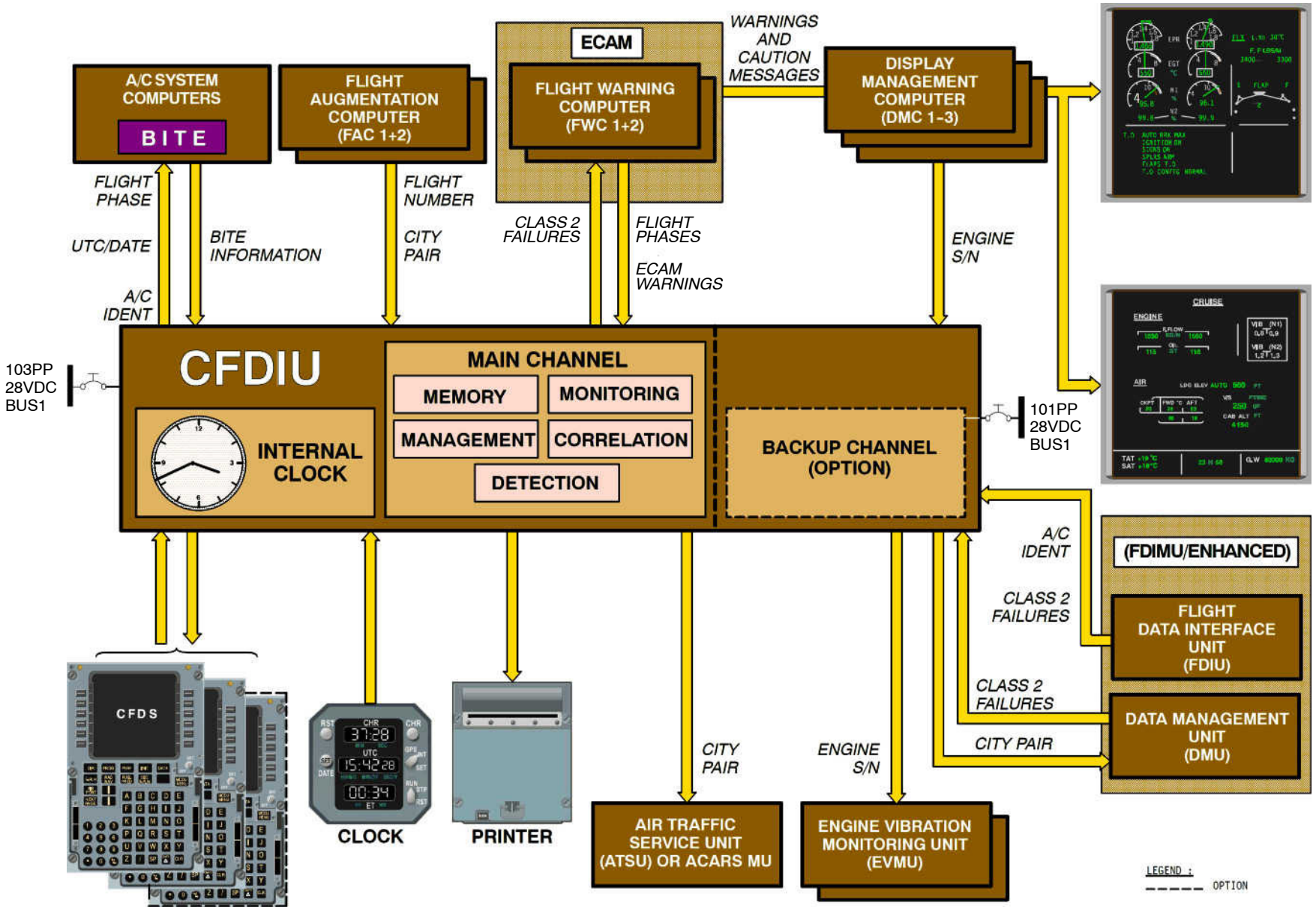


Figure 30 CFDIU Functions

INTERFACES

DMC (Display Management Computer, part of EIS)

The CFDIU receives the Engine Serial Number from the DMC and sends this parameter to the EVMU (Engine Vibration Monitoring Unit).

MU (Management Unit of ACARS)

The ACARS Management Unit receives the city pair from the FAC through the CFDIU.

EVMU (Engine Vibration Monitoring Unit)

The EVMU receives the Engine serial number from the DMC through the CFDIU.

The DMC receives it from the ECU (**E**ngine **C**ontrol **U**nit).

ABNORMAL OPERATION

Clock Back Up

If the aircraft clock fails, the CFDIU takes over and its internal clock sends GMT (UTC) and DATE on the output bus to all type 1 systems.

Upon power–on after A/C clock failure, the item ”GMT/DATE INIT” is added to the CFDS Menu.

This option enables GMT and date initialization.

BACKUP MODE

In BACKUP Mode, only the main computers are available and only the ”SYSTEM REPORT/TEST ” function is available.

In the event of main channel failure:

- If this failure is serious (Power Supply or Microprocessor) the backup channel takes over.

  Only ”BACKUP MODE” is displayed on the CFDS menu.

  No function is available in flight.
- If this failure is minor, the item ”BACKUP MODE” is added to the CFDS menu.

  This enables the access to the backup channel.

  The main channel remains available.

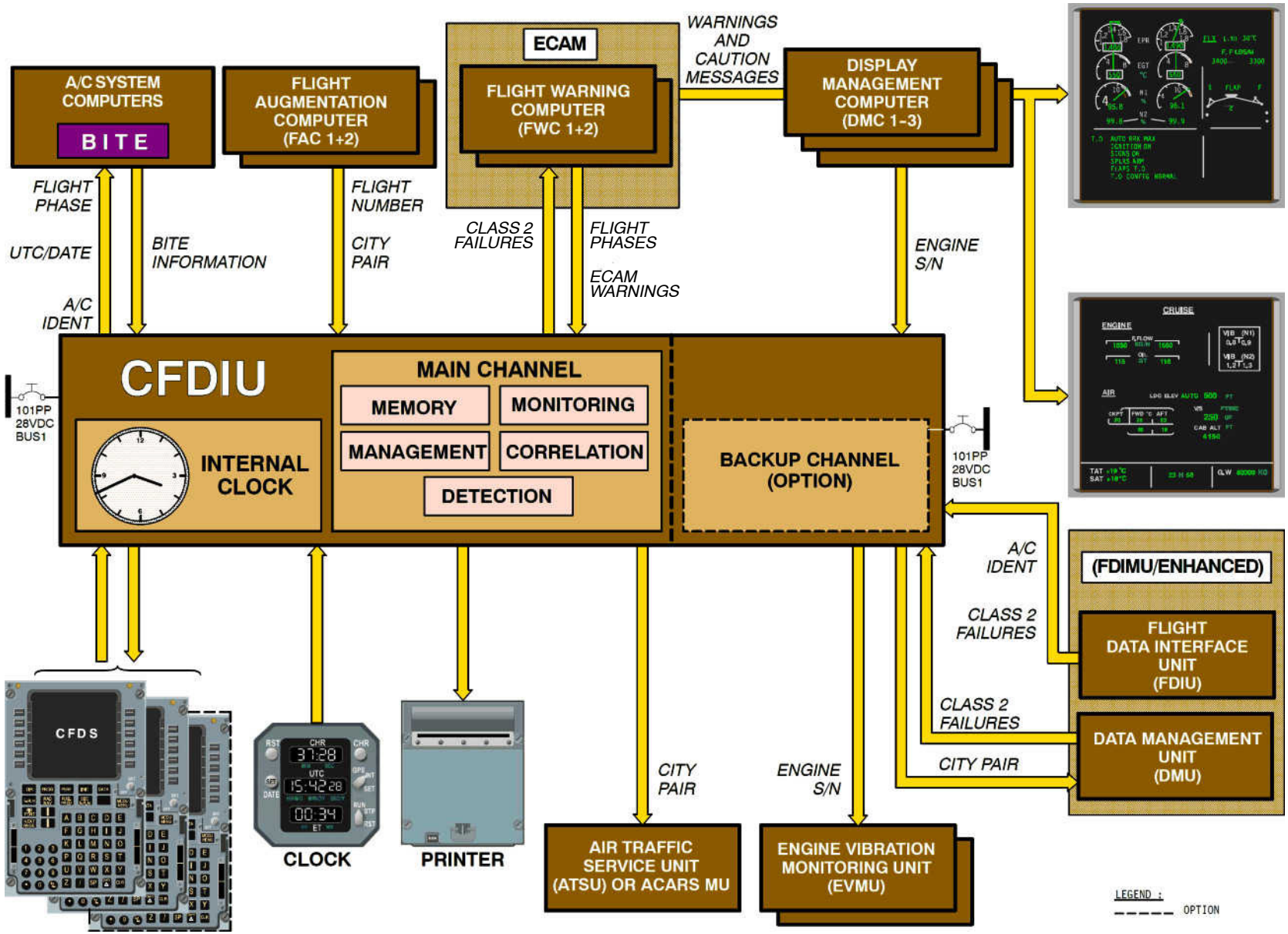


Figure 31 CFDIU Functions

CFDIU TEST MENU PRESENTATION

Menu Mode of the CFDIU

The menu mode of the CFDIU comprises the following four functions:

- LAST LEG REPORT
- LRU IDENTIFICATION
- POWER UP TEST RESULT
- GROUND SCANNING.

LAST LEG REPORT function

The purpose of this function is to memorize the internal or external faults in flight, whether these faults are already present on the ground or not.

In the general case, these faults are detected through permanent monitoring and in some cases, through the power–up test.

The ATA reference, the time at which the failure occurred and the flight phase during which it occurred are associated with each fault message.

Memorization capacity is 5 faults, while new faults delete the oldest ones.

LRU identification function

The purpose of this function is to display the computer part number and database number.

POWER–UP TEST RESULT function

The purpose of this function is to present the CFDIU internal components detected faulty during the last Power–Up Test.

The ATA reference 31–32–34 is associated with each fault message.

In the event of fault, the following messages are displayed:

- CFDIU I/0 ARINC 1 (or 2 or 3) for fault of multiplexor 1, 2 or 3
- CFDIU I/0 DISCRETE 1 (or 2) for fault of discrete inputs/outputs 1 or 2
- CFDIU BITE MEMORY for fault in NVM
- CFDIU for any other fault of the channel

GROUND SCANNING function

The purpose of this function is to present the internal or external faults on the ground, whether these faults are already present in flight or not.

These faults are detected through monitoring activated on manual selection of the function.

Handling of faults:

- Activation
  - After manual selection of the function, the CFDIU monitors the internal and external faults.
  - The ATA reference and the time at which the fault is detected are associated with each fault message.
- Presentation capacity

  Presentation capacity is 5 failures while new faults delete the oldest ones.
- The presentation of this function is identical to that of the LAST LEG REPORT.
- During function progress the CFDIU presents the message: IN PROGRESS (50 SEC) and a RETURN/STOP key is presented to enable function interruption and return to CFDIU BITE menu.
- Criteria of monitoring
  - Monitoring is activated on function selection for the following systems:

    FAC 1, FDIU, DMC 1, AMU, CIDS 1, MCDU, PRINTER, CLOCK, CFDIU and FWCs.

Description of faults

Monitoring and associated message are identical to the case of the LAST LEG REPORT.

NOTE: This manually activated monitoring does not entail acquisition of monitored parameters by the CFDIU.

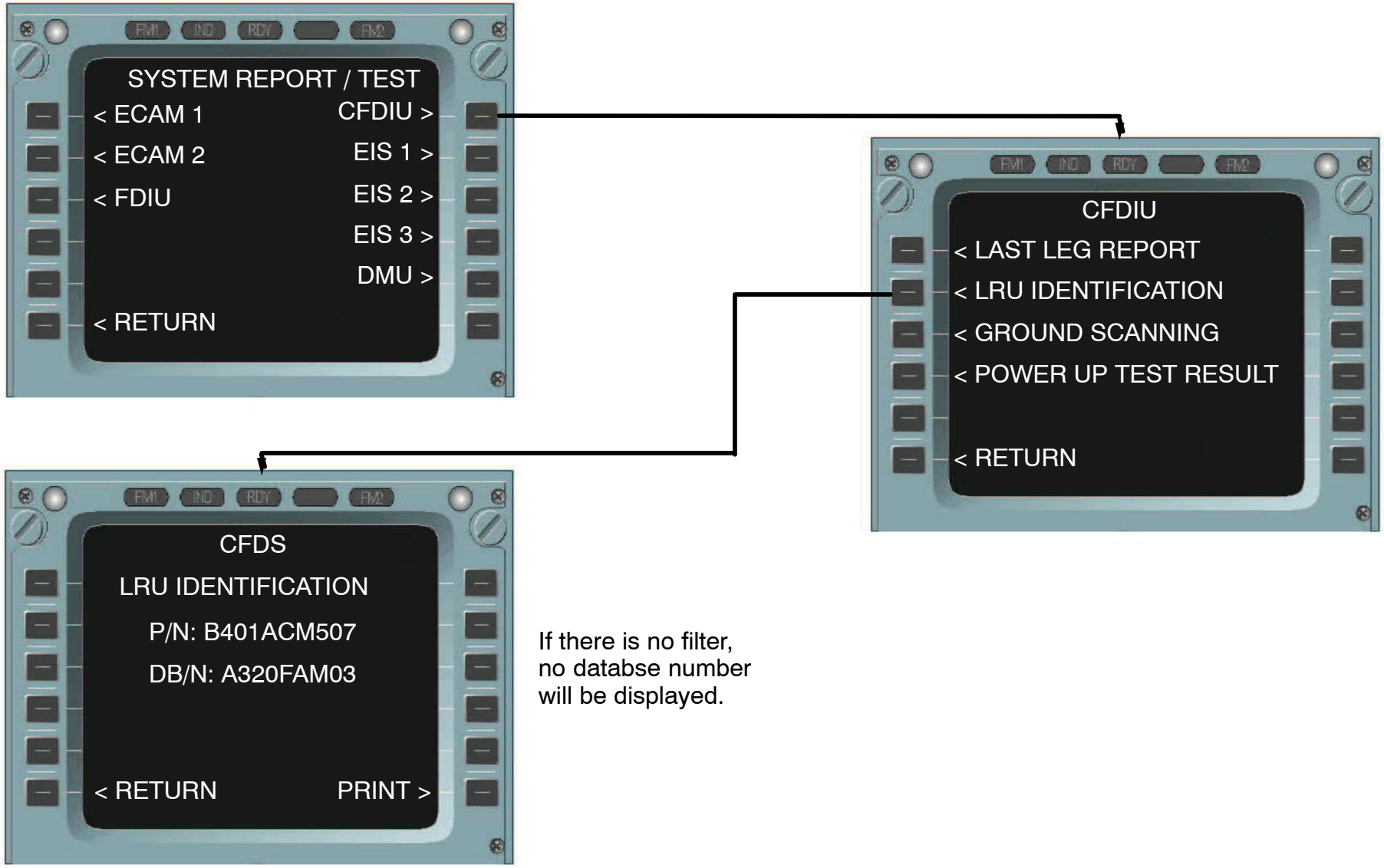
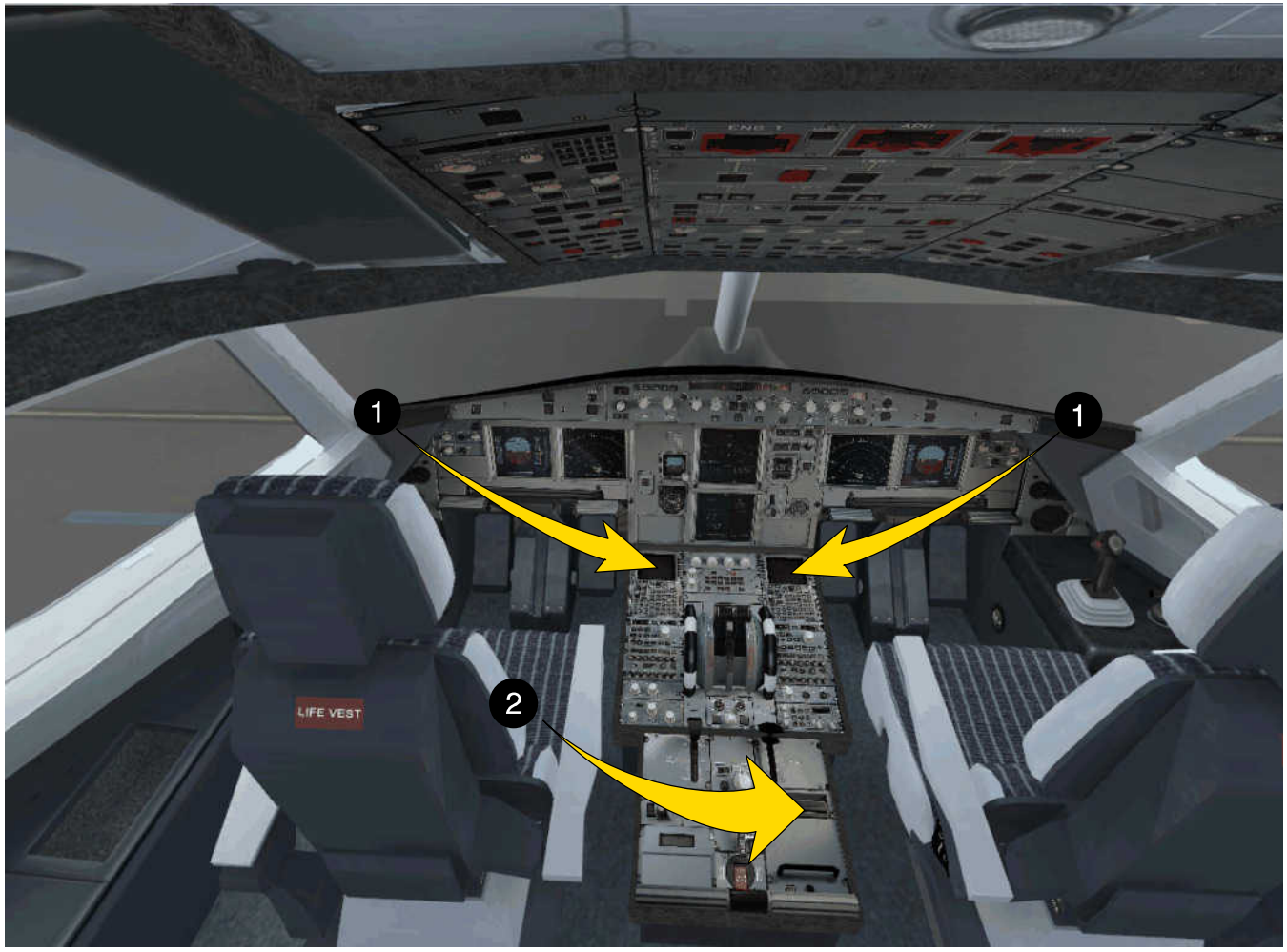


Figure 32 CFDS System Report/Test Menu

CFDS COMPONENT LOCATION



1 MCDU 1 3CA 1
MCDU 2 3CA 2

2 PRINTER

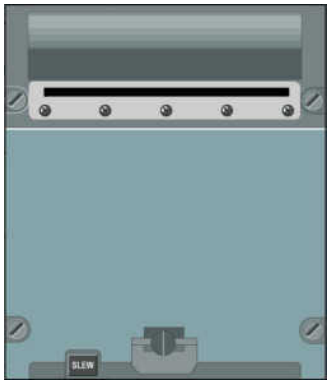
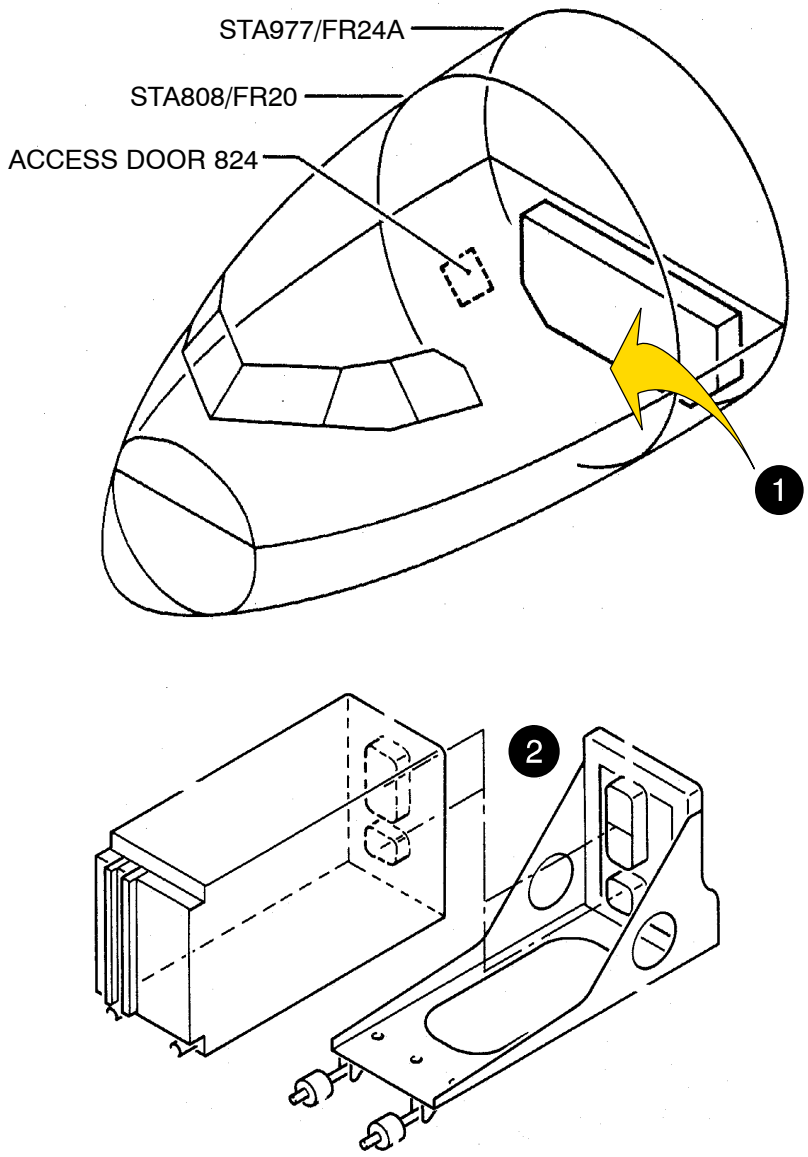


Figure 33 Components Location (1)



1 AFT ELECTRONICS RACK 80VU

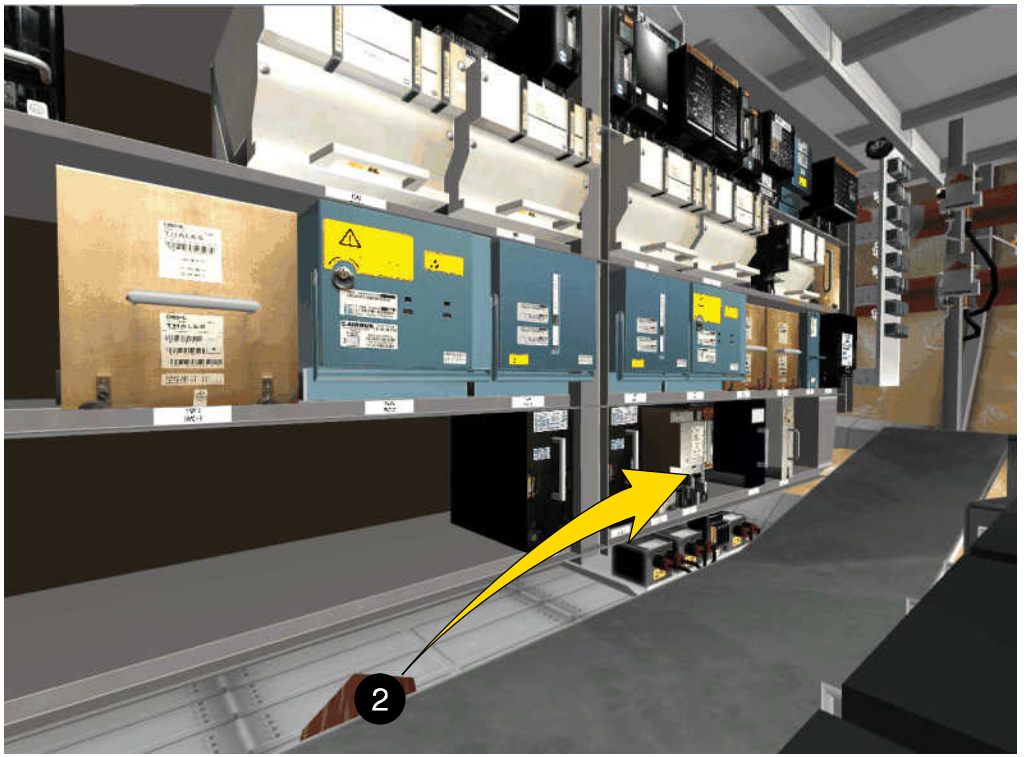


Figure 34 Components Location (2)

TROUBLE SHOOTING PROCEDURE WITH CFDS

COCKPIT EFFECT

After a malfunction, the crew reports the cockpit effect in the log book.

The fault symptoms, relative to the cockpit effect, can be as follows:

- a WARNING/MALFUNCTION + CFDS (**C**entralized **F**ault **D**isplay **S**ystem) FAULT message (with possible associated warnings and system IDENTIFIERS).
- a WARNING/MALFUNCTION alone.
- a CFDS FAULT message alone.

PFR

For the class 1 and 2 failures of CFDS monitored systems, the PFR (**P**ost **F**light **R**eport) permits an access to the concerned list of faults in Airn@v. For this purpose, it gives the following information: ECAM (**E**lectronic **C**entralized **A**ircraft **M**onitoring) WARNING message (if it exists), FAULT message with its SOURCE, ATA reference and IDENTIFIERS list.

When the PFR print is not available, this information can be retrieved through the MCDU (in Normal mode or Menu mode). SIL (**S**ervice **I**nformation **L**etter) 00–028, made of ”spurious maintenance messages”, and the maintenance knowledge let the airlines create a specific data base to filter the messages to be displayed on the PFR.

Once loaded into the CFDIU (**C**entralized **F**ault **D**isplay **I**nterface **U**nit), this maintenance filter data base can be activated through the MCDU.

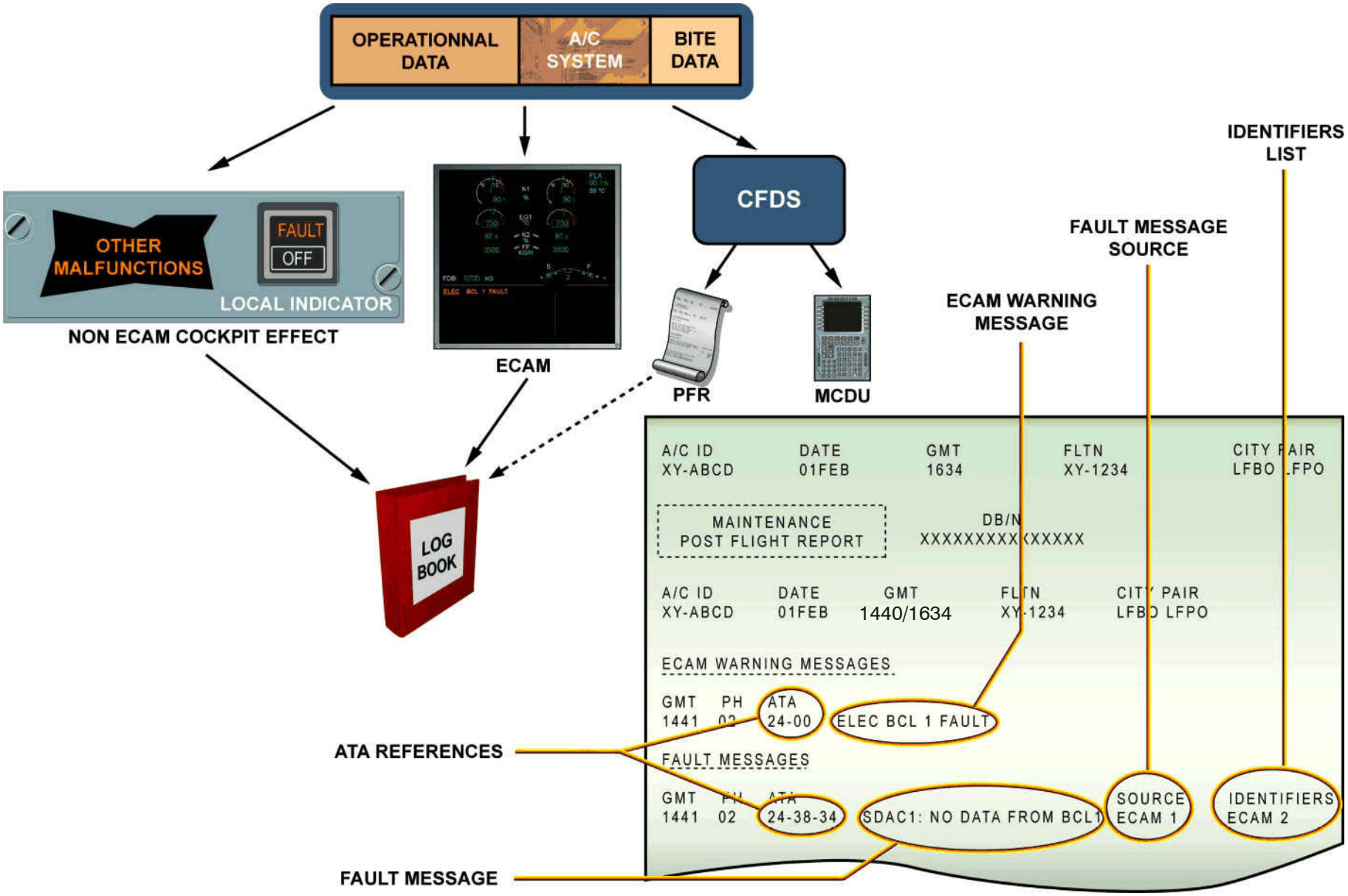


Figure 35 Cockpit Effect & PFR

TROUBLE SHOOTING PROCESS

AIRN@V ENTRY

The CFDS report information gives a direct access to the fault isolation procedure task numbers through Airn@v. You have to select the Troubleshooting documentation to get access to the fault symptoms, which are the association of a warning/malfunction and/or CFDS fault message. The fault symptoms are divided into the five following sections:

- ECAM,
- EFIS (**E**lectronic **F**light **I**nstrument **S**ystem),
- LOCAL warning,
- Crew & Maintenance Observation and,
- CFDS.

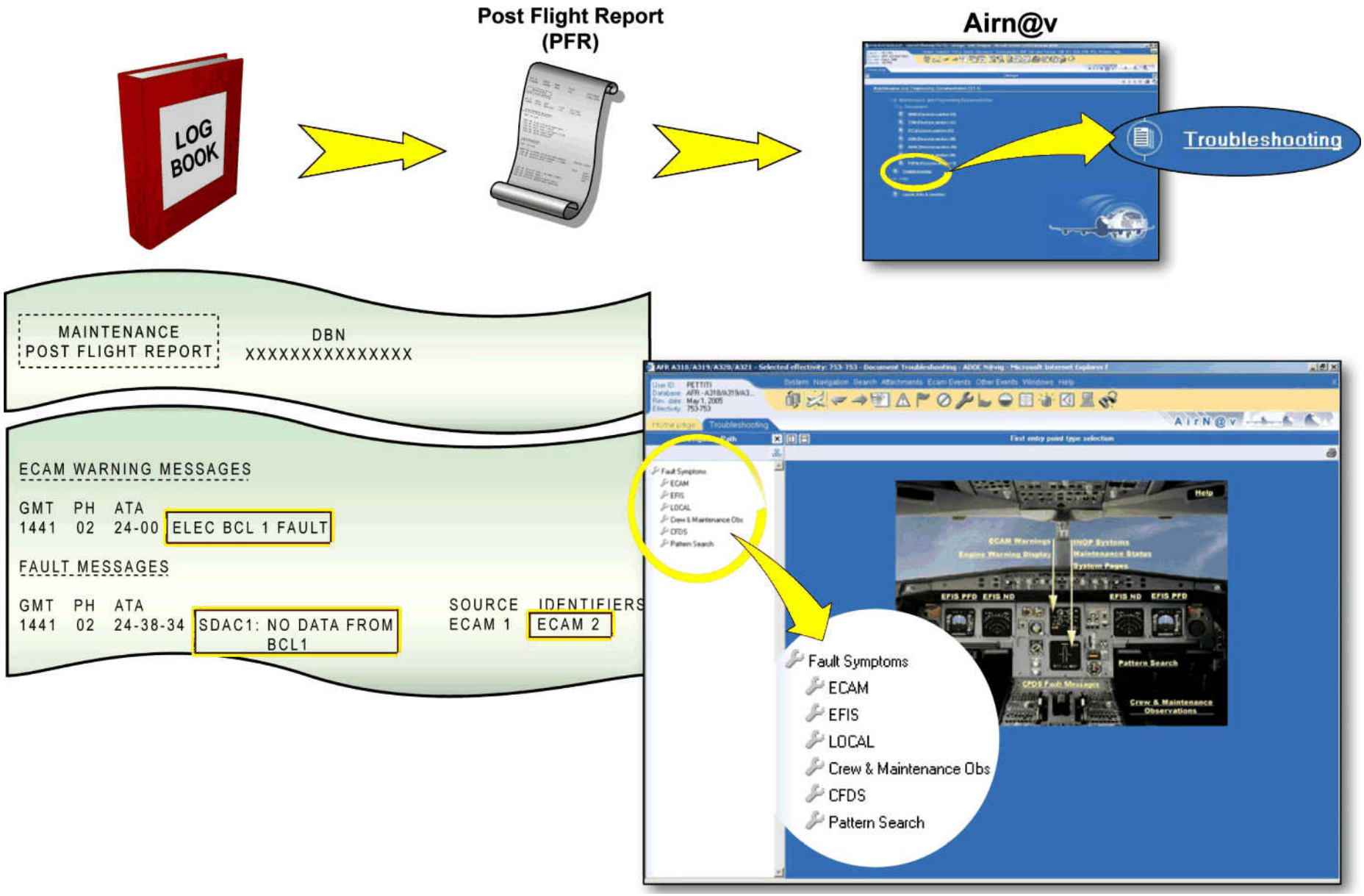


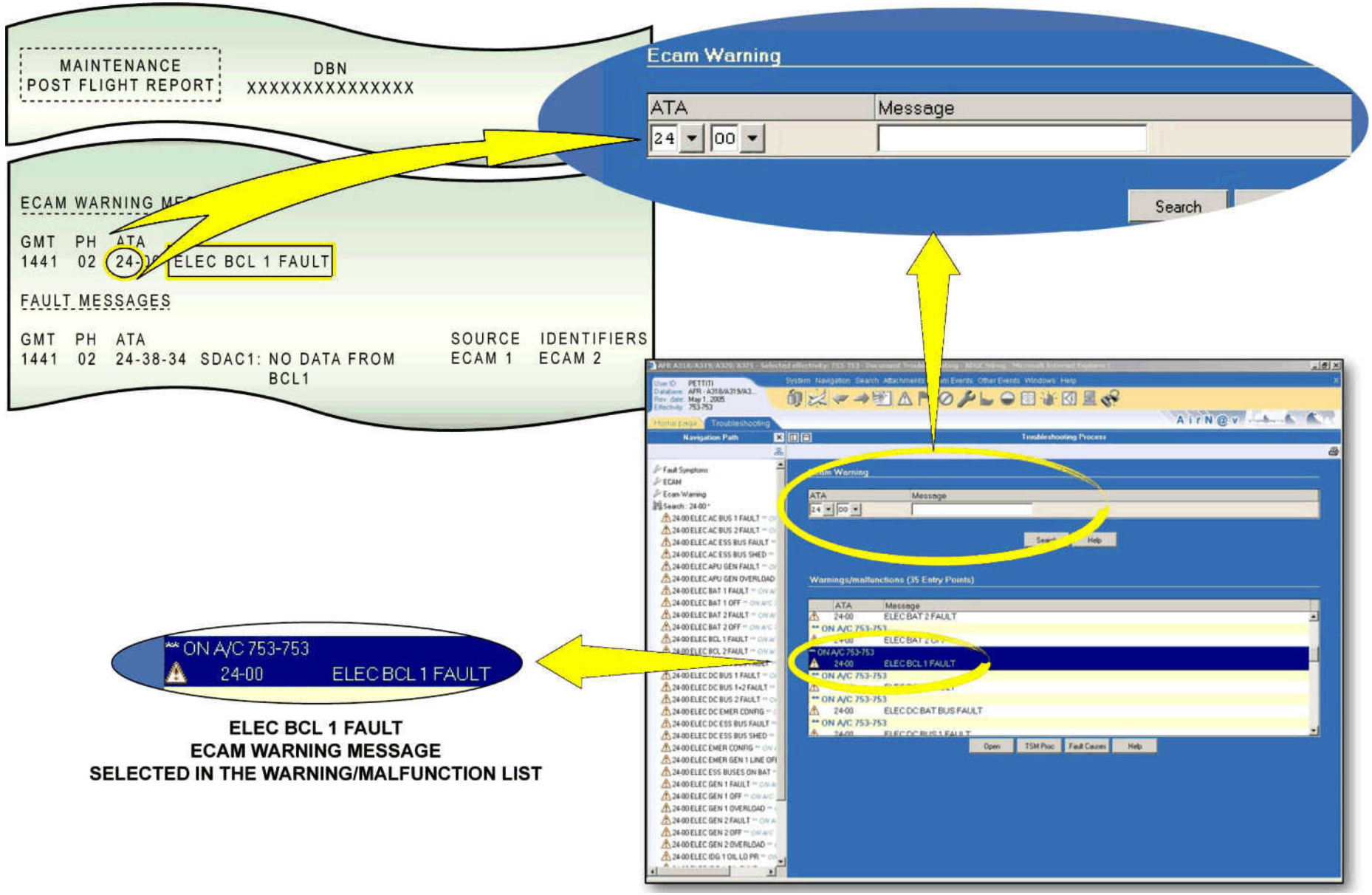
Figure 36 Trouble Shooting Process – AIRN@V Entry

ECAM WARNING SELECTION

To find the reported problem (ELEC BCL 1 FAULT in this example), you have to select ECAM Warning and enter the name of the ECAM WARNING MESSAGE, which appears on the PFR (or on the ECAM Display Unit).

You can also enter the ATA chapter to have a list of Warnings/malfunctions, and then you select the related ECAM warning message.

NOTE: If required, additional Warnings/malfunctions must be selected.



ELEC BCL 1 FAULT
ECAM WARNING MESSAGE
SELECTED IN THE WARNING/MALFUNCTION LIST

Figure 37 Trouble Shooting Process – ECAM Warning Selection

TROUBLE SHOOTING PROCESS

CORRELATION

A Warning/malfunction with its correlated CFDS fault could have several associated fault isolation procedure tasks according to the systems, which have detected the fault.

The PFR gives a SOURCE item, which must be compared with the SOURCE item of the CFDS Fault messages list in Airn@v.

By selecting the appropriate fault message, the Airn@v system gives the right access to the fault isolation procedure.

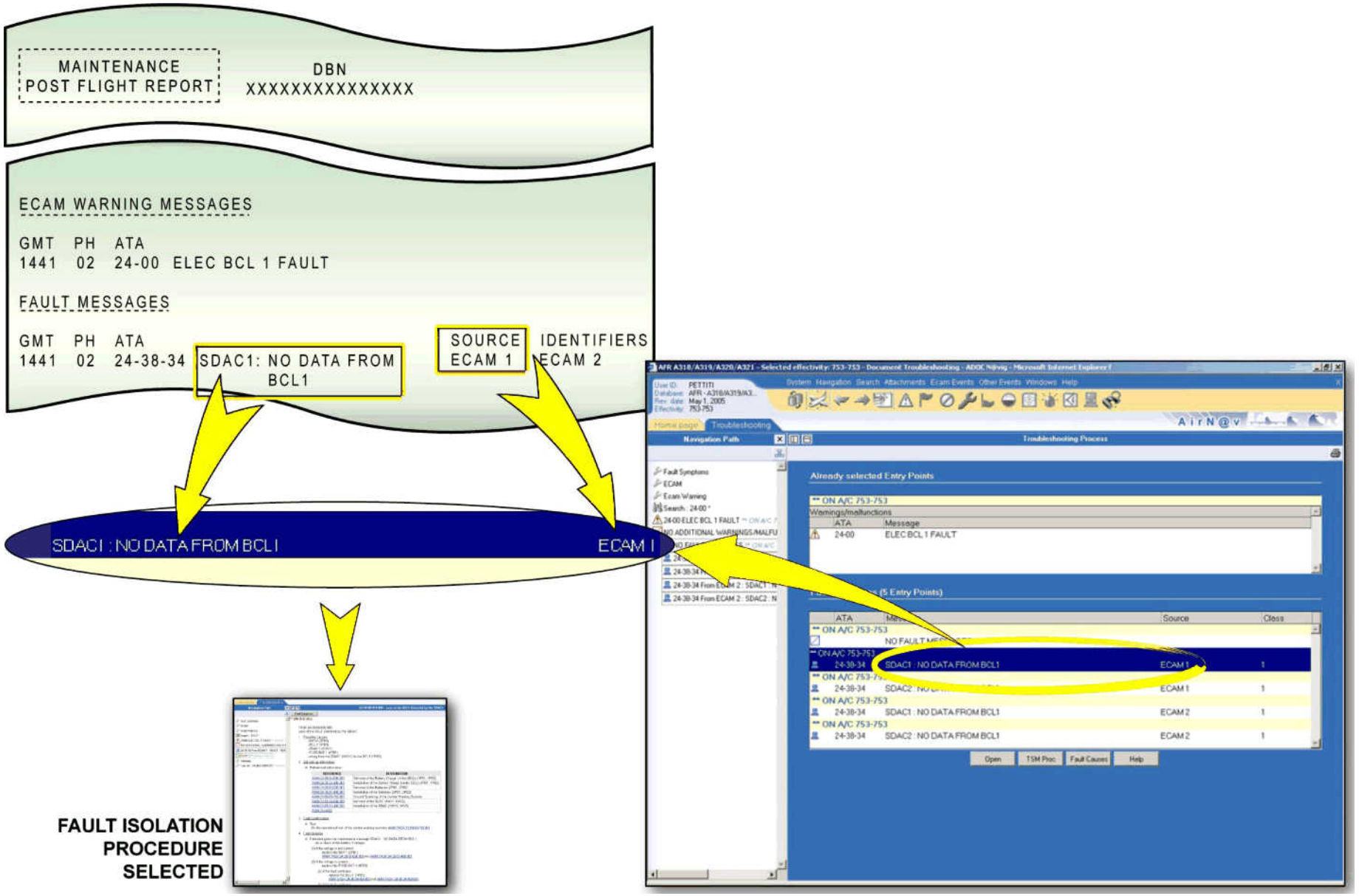


Figure 38 Trouble Shooting Process – Correlation

FAULT ISOLATION PROCEDURE

The related fault isolation procedure task in Airn@v (TASK number 24–30–00–810–805) has a presentation of possible causes and the fault confirmation (for example by an operational test, power–up test or GROUND SCANNING).

It also gives the fault isolation procedure including LRU (**L**ine **R**eplaceable **U**nit) removal/installation, wiring check, etc.... In addition, the procedure gives access to the useful aircraft documentation references knowing that all manuals contained in AirN@v are interconnected by hyperlinks, and all the schematics can be found and printed easily.

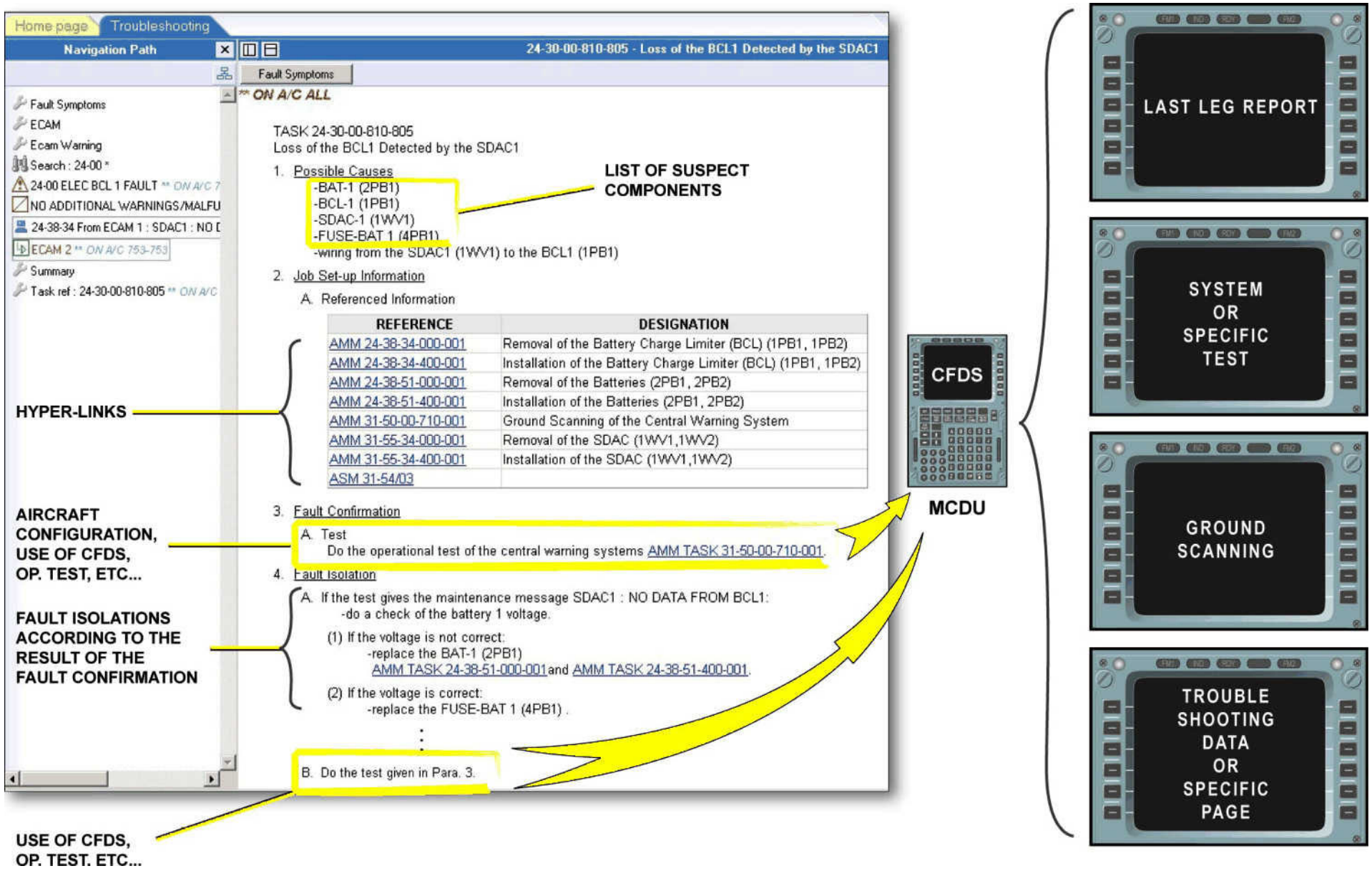


Figure 39 Fault Isolation Procedure

31–38 UP AND DOWN DATA LOADING SYSTEM

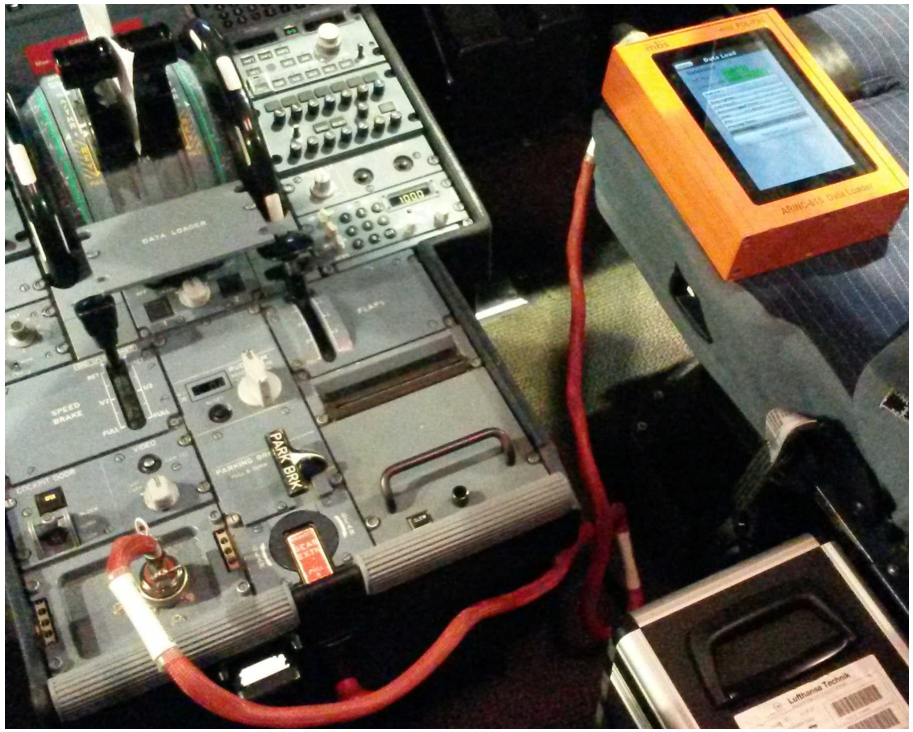
SYSTEM DESCRIPTION

GENERAL

The data loading system is an interface between the aircraft computers and ground data processing equipment used to update software (S/W) and database or to retrieve aircraft system data. The data loading system includes:

- a DLS (**D**ata **L**oading **S**elector) to select the desired computer to be loaded,
- a MDDU (**M**ultipurpose **D**isk **D**rive **U**nit) to upload or download data,
- a stowage box with a 42 disk maximum capacity,
- a DLRB (**D**ata **L**oading **R**outing **B**ox) to route the input/output data between the disk unit and the target computer.

PORTABLE DATA LOADER



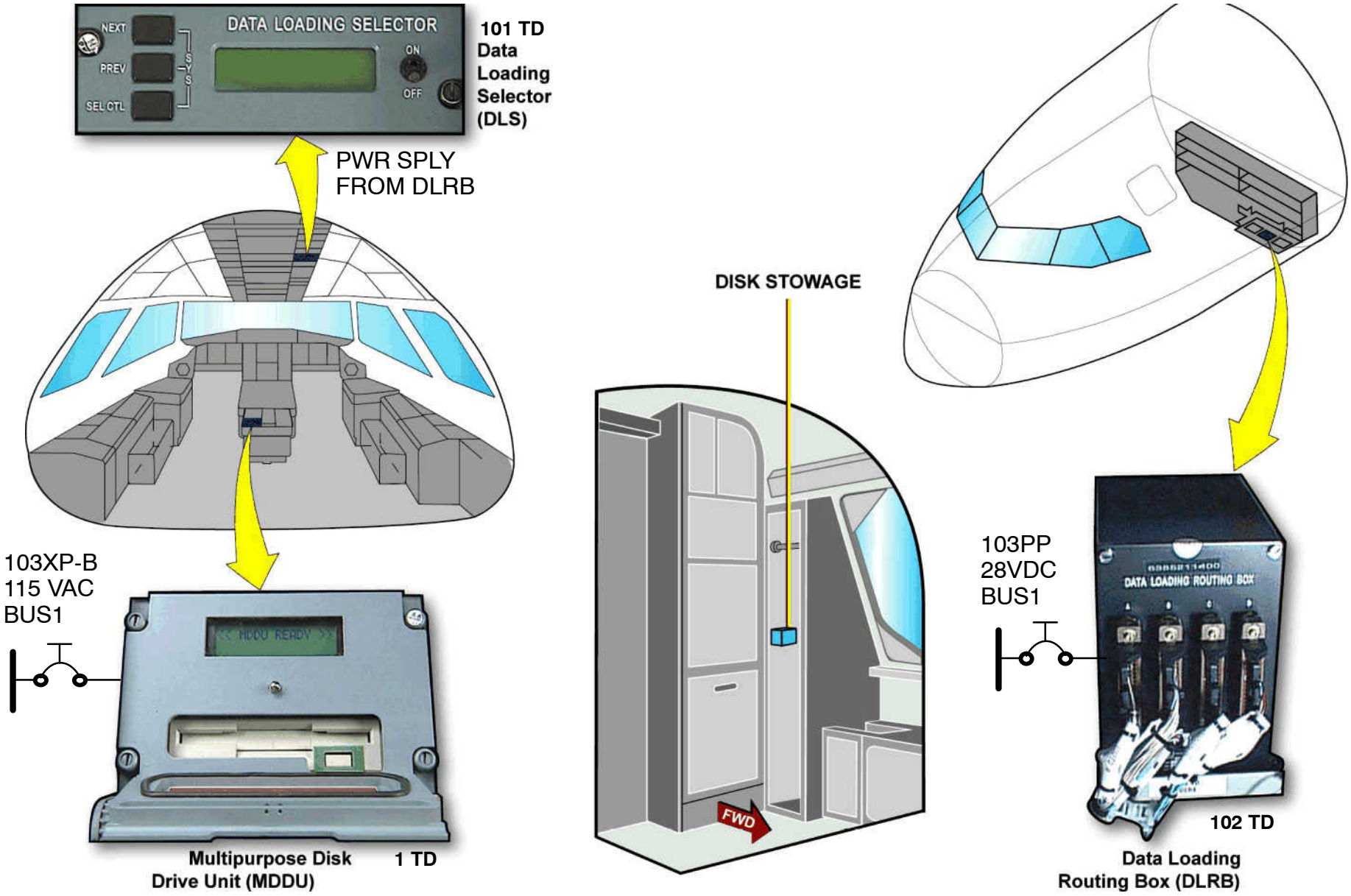


Figure 40 Data Loading Component Location

UP & DOWN DATA LOADING SYSTEM INTERFACES

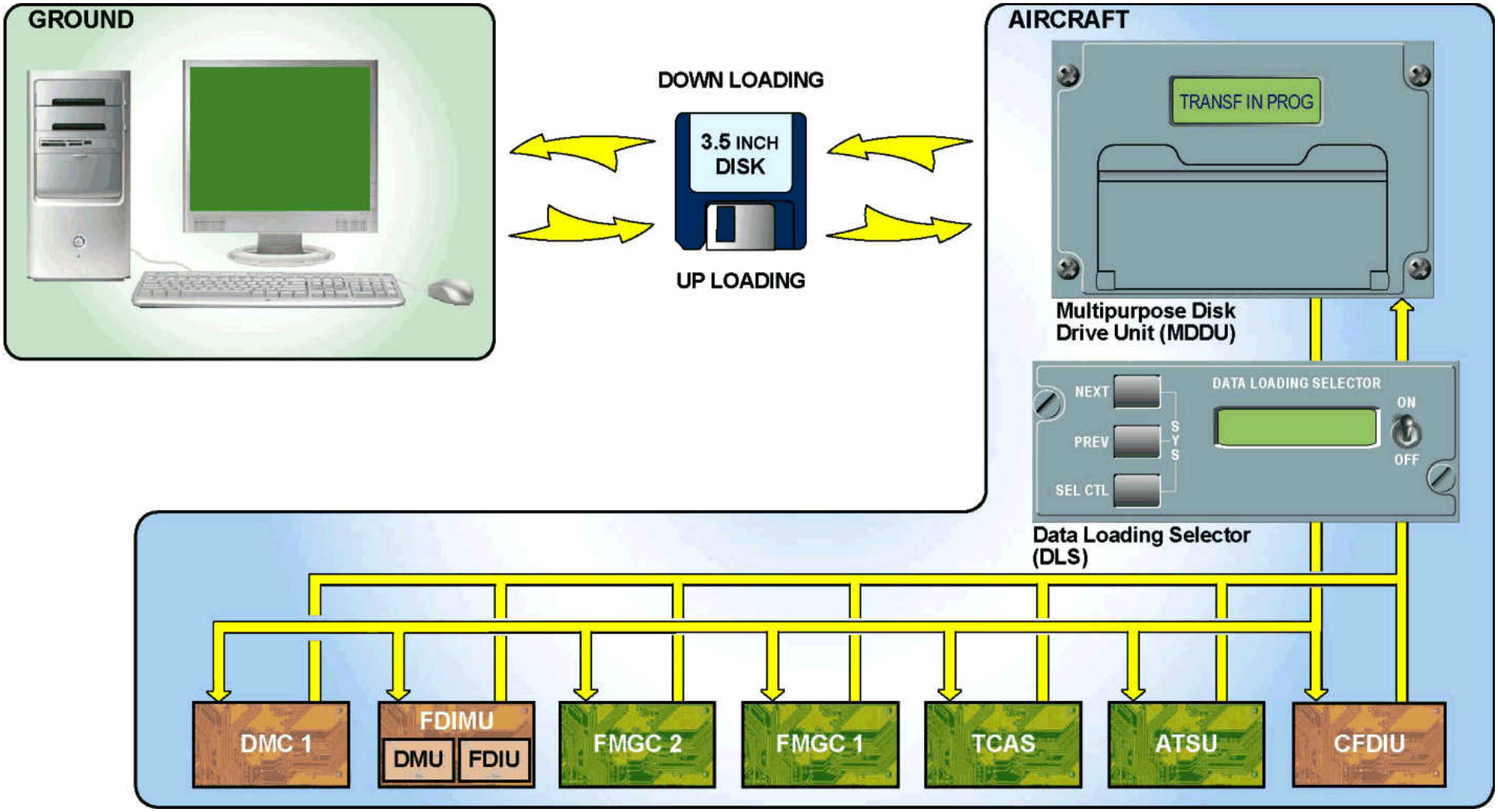
UP LOADING

The aircraft system computers use the loading system to update their data base, for example the FMGC (**F**light **M**anagement and **G**uidance **C**omputer) or to modify parts of their operational S/W, for example the ATSU (**A**ir **T**raffic **S**ervice **U**nit). The Up loading is automatically done from a 3.5 inch disk, via an internal logic specific to each computer.

DOWN LOADING

The down loading system is used to down load, to a 3.5 inch disk, the data recorded by some computers during aircraft operation, for example the DMU (**D**ata **M**anagement **U**nit) part of the FDIMU on enhanced aircraft (**F**light **D**ata **I**nterface and **M**anagement **U**nit).

Down loading is done automatically through an internal logic specific to each computer.



DMC: DISPLAY MANAGEMENT COMPUTER
FDIMU: FLIGHT DATA INTERFACE MANAGEMENT UNIT (DMU + FDIU)
DMU: DATA MANAGEMENT UNIT
FDIU: FLIGHT DATA INTERFACE UNIT
FMGC: FLIGHT MANAGEMENT & GUIDANCE COMPUTER
TCAS: TRAFFIC ALERT AND COLLISION AVOIDANCE SYSTEM
ATSU: AIR TRAFFIC SERVICE UNIT
CFDIU: CENTRALIZED FAULT DISPLAY INTERFACE UNIT

Figure 41 Up Loading & Down Loading Interfaces

UP & DOWN DATA LOADING SYSTEM UTILIZATION

GENERAL

The MDDU (**M**ultipurpose **D**isk **D**rive **U**nit) has two functions: uploading and downloading. According to the operation to do, the disk, which is used, has to contain specific information (e.g. configuration file). Before doing an up data loading operation, refer to the relevant procedure for the related system in the AMM (**A**ircraft **M**aintenance **M**anual).

Up loading procedure will only be illustrated, down loading is similar.

UP LOADING PROCEDURE

When you have selected the disk related to the computer to be loaded from the disks in the storage box, you have to select the computer by means of the DLS (**D**ata **L**oading **S**elector). The MDDU READY message is shown on the MDDU window: the system is in the standby state. After selecting FMGC (**F**light **M**anagement and **G**uidance **C**omputer) 2 on the DLS, you have to open the MDDU door, insert the disk in the data loader disk drive and close the MDDU door. When the disk is inserted in the disk drive, the READY message is shown: this message acknowledges disk insertion. The MDDU processes the specific information contained in the disk, contacts the computer to be loaded and shows the WAIT RESPONSE message until the computer is ready to receive the data. This message stays permanently displayed when:

- the computer is not power supplied or is out of order,
- the DLS is set to the wrong computer,
- the configuration file is not correct,
- the LGCIU (**L**anding **G**ear **C**ontrol and **I**nterface **U**nit) 1 is not powered.

As soon as a dialog is established between the computer to be loaded and the data loader, the TRANSFer IN PROGress message is displayed and the data is transferred to the computer.

NOTE: The disk should not be extracted while TRANSF IN PROG message is shown as damage to the disk could result.

When the data transfer is terminated and no anomalies are detected, the TRANSF COMPLETE message is shown to inform the operator that the transfer is successfully completed.

If more than one disk for the up loading is necessary , the EJECT DISK and INSERT NEXT DISK message are displayed one after the other on the MDDU when the next disk needs to be inserted. This disk must contain a configuration file identical to the previous one and its order in the sequence must be up loaded on the same computer.

When you have ejected the disk from the disk drive, you have to set the ON/OFF switch on the DLS to OFF. Check on one of the MCDUs that the software (S/W) reference shown on the LRU (**L**ine **R**eplaceable **U**nit) IDENTIFICATION page of the concerned computer agrees with the S/W reference of the disk used for the up loading.

DOWN LOADING PROCEDURE

If there is no disk inserted in the data loader disk drive, the system is in the standby state and does not communicate with any onboard computers. The MDDU READY message is shown on the MDDU window: the system is in standby state. The MDDU is activated by inserting the disk containing a configuration file defining the label of the computer concerned by a down loading operation: the READY message is shown on the MDDU window. Supposing that the disk inserted is configured to dialog with the DMU (**D**ata **M**anagement **U**nit), the operator can down load the reports by pushing the SELector ConTroL key on the DLS when AIDS (**A**ircraft **I**ntegrated **D**ata **S**ystem) is shown. After the computer has acknowledged the request, it sorts the data to be transferred into files and interrupts the wait phase established with the MDDU: the WAIT RESPONSE message is shown on the MDDU window. Then, the computer downloads its information: the TRANSF IN PROG message is shown throughout the transfer. When the data transfer is terminated and no anomalies are detected, the TRANSF COMPLETE message is shown to tell the operator that the transfer is successfully completed.

ABNORMAL OPERATION

Other messages shown on the MDDU window tell the operator of the transfer status:

- TRANSFER FAILURE: If the MDDU has to stop data transfer (up or down loading) for any reason, this message is shown.
- UNIT FAIL: The MDDU shows this message if a hardware (H/W) failure is detected during the self–test. In this case, the MDDU stops all operations.
- DISK ERROR: If the MDDU cannot read or write data on the disk (incorrect formatting, write–protected, disk damaged, etc), it will interrupt the operations and send this message.

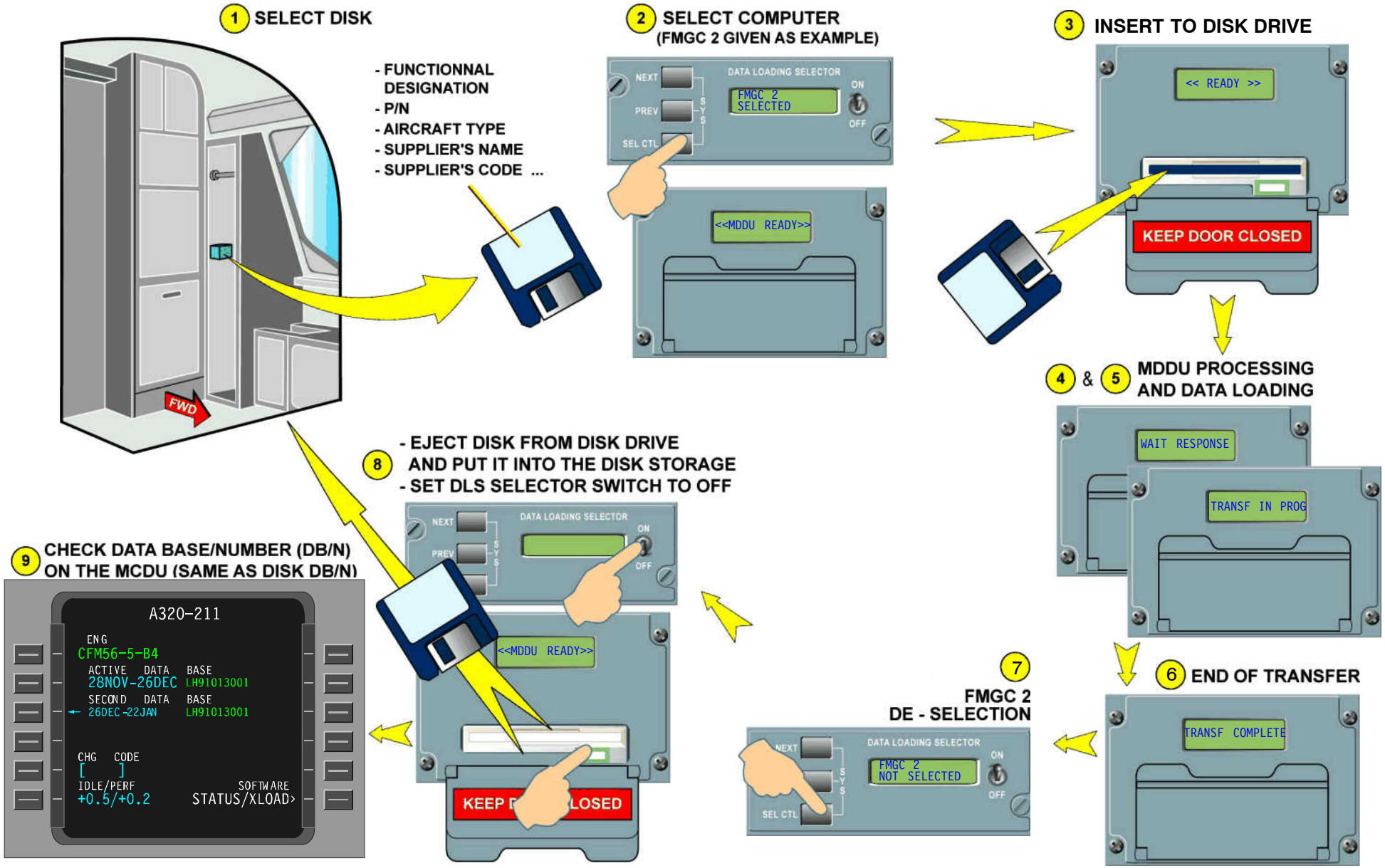


Figure 42 Data Loading System Operation

31–00 INDICATING/RECORDING SYSTEMS - GENERAL

AIRMAN (OPTIONAL) PRESENTATION

GENERAL

AIRMAN is a ground–based software dedicated to the identification and the management of unscheduled maintenance.

AIRMAN receives and analyses the aircraft status information generated by the Onboard Maintenance System (OMS) and also e–logbook data.

The information is automatically transmitted to the ground by the aircraft's communication system.

These information sources are synthesized, combined with Airbus's and the Airline's own technical documentation and presented through a user–friendly interface. Aircraft status information is sent to AIRMAN while the aircraft is both in flight and on ground. Message analysis also takes place in real–time.

These capabilities maximize the time available for appropriate maintenance actions to be determined and preparations to be made.

AIRMAN is capable of analyzing an aircraft's fault history and consequently identifying and prioritizing preventive maintenance actions.

The aircraft maintenance philosophy is based on the following steps:

- fault detection made by the computers BITEs,
- cockpit effects as flags on Display Units, and warning generated by the Flight Warning System (FWS),
- centralization and correlation by the Onboard Maintenance System (OMS) of BITE faults, cockpit effects and related maintenance procedures generation of Post Flight Report (PFR)
- fault event data reporting through the eLogbook (option)
- fault event data and reports transmission to AIRMAN for maintenance support on ground

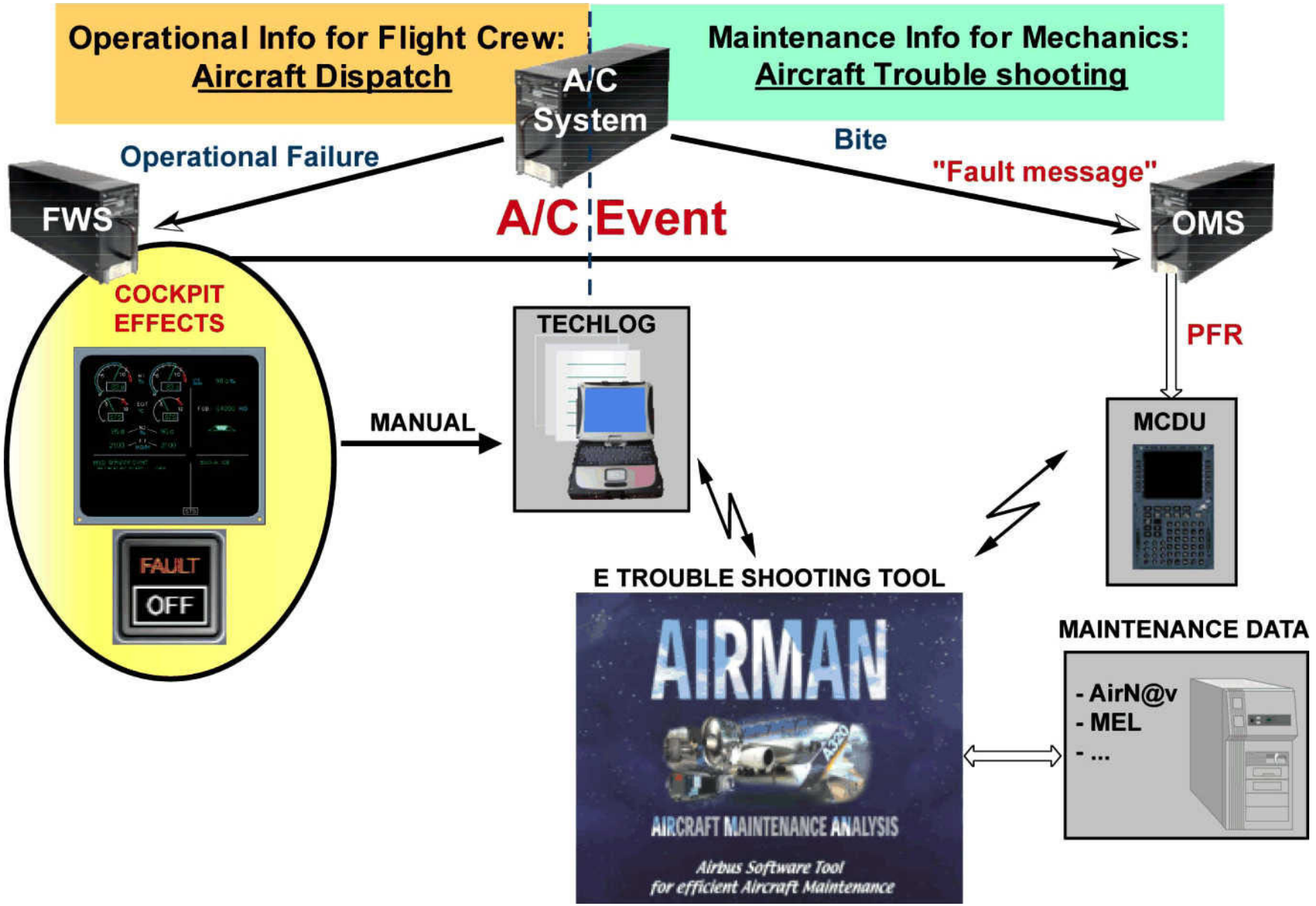


Figure 43 Airman Overview (Option)

E-LOGBOOK (OPTION)

GENERAL

The eLogbook is the main communication means for aircraft operational staff. It enables the flight crew and the technical staff to be aware of the aircraft status, to enter aircraft defect and to report maintenance and servicing actions.

The eLogbook lets the flight crew:

- consult the Logbook status,
- accept / create a new flight,
- report aircraft defects,
- hand over to maintenance.

The maintenance staff uses the eLogbook to:

- consult the aircraft status,
- report aircraft defects,
- report corrective or scheduled maintenance actions,
- report servicing actions,
- build the Certificate of Release into Service (CRS) of the aircraft.

Finally the cabin crew can also use the eLogbook to:

- consult the aircraft status,
- inform the flight crew about regulatory cabin defects,
- report none regulatory cabin defects.

The eLogbook runs on a fully stand−alone laptop and is not connected to the aircraft. The eLogbook is stowed in the cockpit by the flight crew.

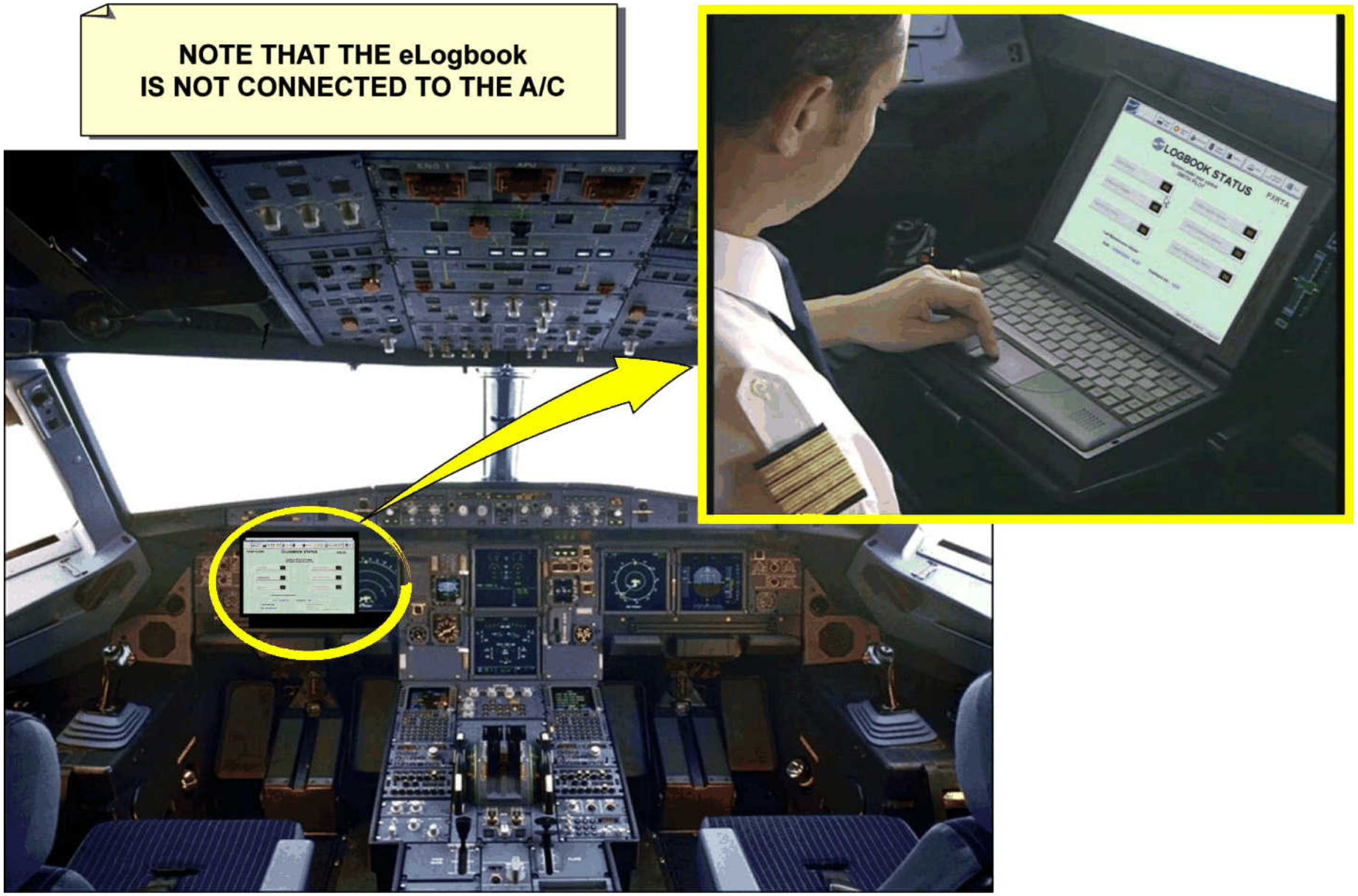


Figure 44 e-Logbook (OPTION)

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