

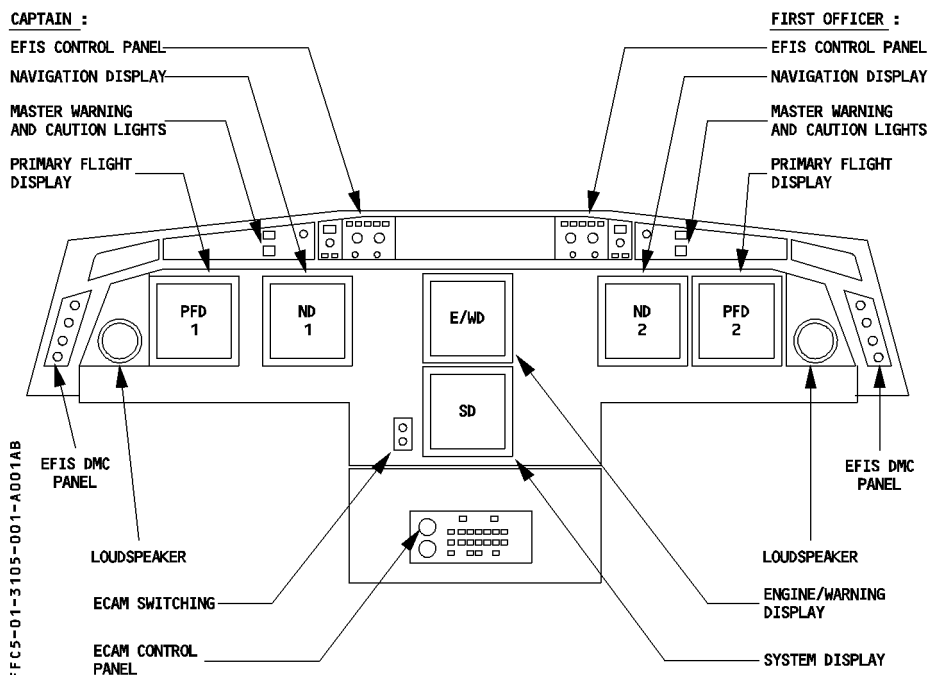
virgin atlantic A340-600 <i>Flight crew operating manual</i>	INDICATING/RECORDING SYSTEMS EIS GENERAL	1.31.05 SEQ 001	P 1 REV 08
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INTRODUCTION

The electronic instrument system (EIS) presents data on six identical display units (DUs):

- The electronic flight instrument system (EFIS) displays mostly flight parameters and navigation data on the primary flight displays (PFDs) and navigation displays (NDs)
- The electronic centralized aircraft monitor (ECAM) presents data on the engine/warning display (E/WD) and system display (SD) :
 - Primary engine indications, fuel quantity, flap and slat position
 - Warning and caution alerts or memos
 - Synoptic diagrams of aircraft systems, and status messages
 - Permanent flight data

COCKPIT ARRANGEMENT



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ARCHITECTURE

DISPLAY UNIT (DU)

The instrument panels have six identical units cathode ray tubes.

These DUs are full-color Liquid Crystal Displays (LCD).

DISPLAY MANAGEMENT COMPUTER (DMC)

Three identical DMCs acquire and process all the signals received from the sensors and other computers to generate the images to be displayed on the primary flight displays, navigation displays, engine/warning display, and system display.

Each DMC has two independent channels, an EFIS channel and an ECAM channel, and is able to simultaneously drive one PFD, one ND, and either of the ECAMs in its engine warning or system status task.

SYSTEM DATA ACQUISITION CONCENTRATOR (SDAC)

The two identical SDACs acquire data, then generate signals. Some of these signals go to the three DMCs, which use them to generate displays of system pages and engine parameters. Others go to the flight warning computers, which use them to generate ECAM messages and aural alerts.

FLIGHT WARNING COMPUTER (FWC)

The two identical FWCs generate alert messages, memos, aural alerts, and synthetic voice messages.

For this purpose they acquire data :

- Directly from aircraft sensors or systems to generate red warnings.
- Through the SDACs to generate amber cautions.

The ECAM display units display the alert messages generated by the FWCs.

The FWCs also generate :

- Radio altitude callouts.
- Decision height callouts.
- Landing speed increments.

ATTENTION-GETTERS

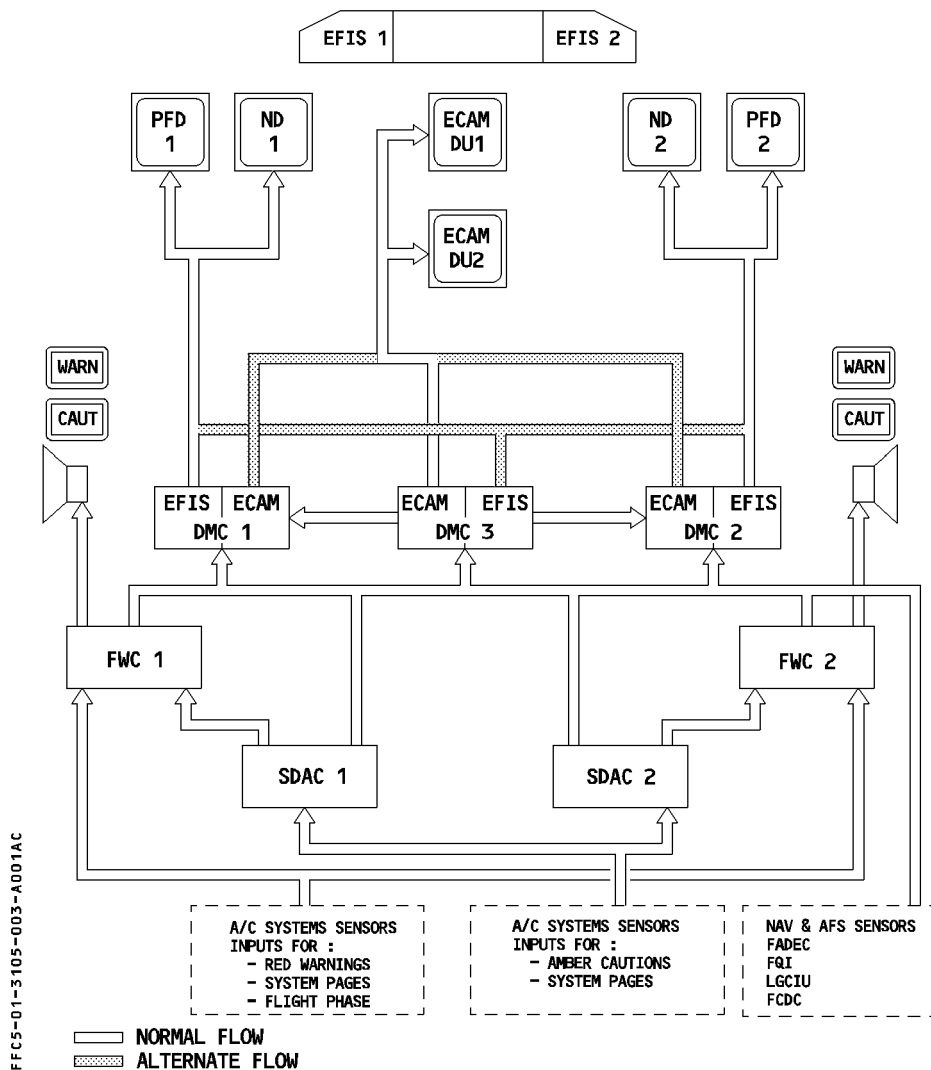
The FWCs also drive the attention-getters. Each pilot has a set of these on the panel under the glareshield. They are :

- A master warning light that flashes “MASTER WARN” in red, for red warnings.
- A master caution light that illuminates “MASTER CAUT” in amber, for amber cautions.

LOUDSPEAKER

The communications loudspeakers announce aural alerts and voice messages, and do so even when they are turned off.

EIS BLOCK DIAGRAM



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CONTROLS AND SWITCHING

ECAM CONTROL PANEL (ECP)

This panel allows the pilot to have the ECAM display units display either warning and caution messages or system and system status images.

ECAM DMC SWITCHING

A switch on the ECAM SWITCHING panel which is on the main instrument panel allows the flight crew to replace the DMC 3 with DMC 1 or DMC 2.

ECAM/ND SWITCHING

A switch on the ECAM SWITCHING panel allows the flight crew to transfer the ECAM system display to either the captain's or the first officer's navigation display.

PFD/ND SWITCHING

A PFD/ND XFR pushbutton on each side console allows the pilot to swap displays on respective onside DUs.

EFIS DMC SWITCHING

A switch on each side console allows the pilot to manually select the DMC 3 or the opposite DMC for supply of data to the onside PFD/ND.

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RECONFIGURING THE DISPLAY MANAGEMENT COMPUTER (DMC)

In normal operation :

- DMC 1 supplies data to the Captain's PFD and ND.
- DMC 2 supplies data to the First Officer's PFD and ND.
- DMC 3 supplies data to the upper and lower ECAM DU.

If a DMC fails, the corresponding DU displays the INVALID DATA message. The flight crew can replace DMC 1 or 2 with DMC 3 by turning the EFIS DMC selector, on the EFIS DMC panel, to 3.

In case of DMC 3 failure, DMC 1 automatically takes over and supplies the ECAM DUs, provided the ECAM SWITCHING selector is in the AUTO position.

RECONFIGURING DISPLAY UNITS (DUS)

FAILURE OF UPPER ECAM DU (OR CTL/BRIGHTNESS KNOB TURNED TO OFF)

If the upper ECAM display fails, or is switched off :

- The engine/warning page automatically replaces the system/status page on the lower ECAM DU.

The flight crew can display the system/status page by :

- Using the "ECAM/ND XFR" switch, on the ECAM SWITCHING panel, to move it to a navigation display unit (NDU), or
- Pushing and holding (for a maximum of 3 minutes) the related system page pushbutton, on the ECAM control panel, to temporarily display it on the lower ECAM DU (instead of the engine/warning page).

FAILURE OF LOWER ECAM DU (OR CTL/BRIGHTNESS KNOB TURNED TO OFF)

If the lower ECAM display fails, or is switched off, the flight crew can display the system/status page by :

- Using the "ECAM/ND XFR" switch, on the ECAM SWITCHING panel, to display it on the NDU, or
- Pushing and holding (for a maximum of 3 minutes) the related system page pushbutton on the ECAM control panel, to temporarily display it on the upper ECAM DU (instead of the engine/warning page).

FAILURE OF BOTH ECAM DUs

If both ECAM displays fail, the flight crew may :

- Use the "ECAM/ND XFR", on the ECAM SWITCHING panel, to display the engine/warning page on a navigation display and, if needed,
- Push and hold (for a maximum of 3 minutes) the related system page pushbutton, on the ECAM control panel, to temporarily display the system/status page on an ND.

PFDU/NDU RECONFIGURATION

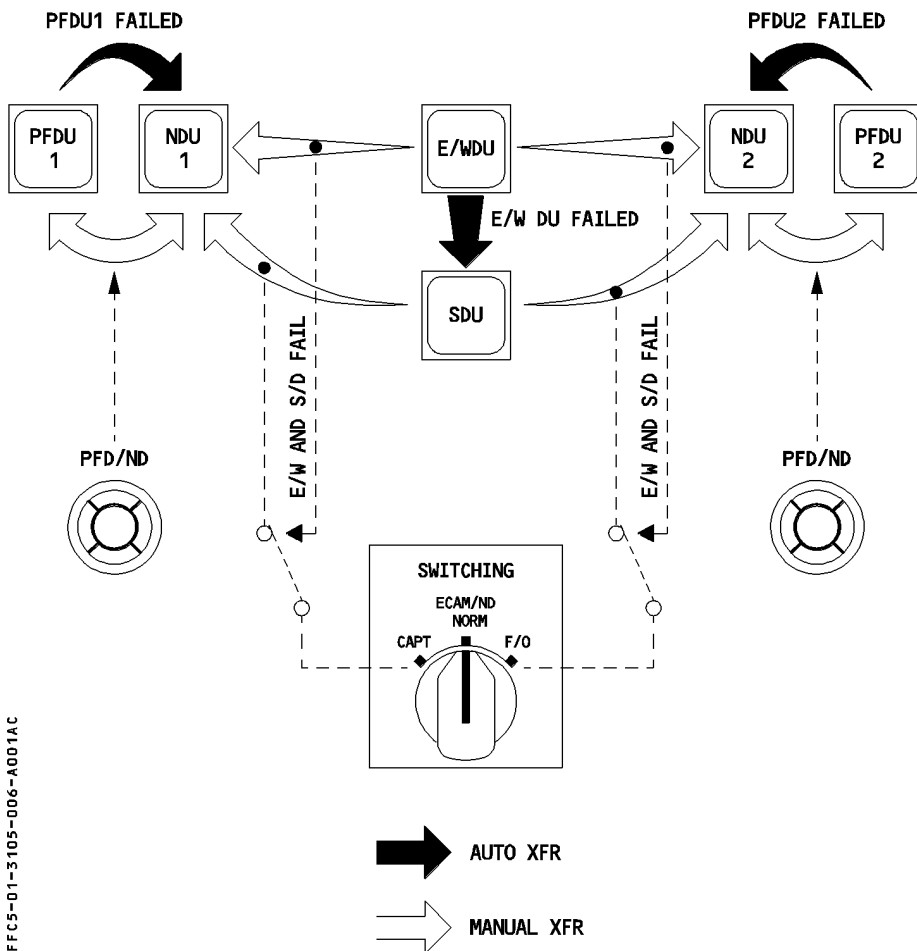
If a PFDU fails, the system automatically transfers the PFD to the NDU.

The pilot can also make this transfer manually by :

- turning the PFD ON-OFF/brightness control OFF, or
- pressing the PFD/ND/XFR pushbutton, which cross-changes the images between the PFDU and the NDU.

If an NDU fails, the pilot can use the PFD/ND/XFR pushbutton to transfer the ND image to the PFDU.

DU RECONFIGURATION



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