HIGHLIGHTS

REVISION NO. 54 May 01/08

Pages which have been revised are outlined below, together with the Highlights of the Revision

CH/SE/SU PAGES	C	REASON FOR CHANGE	EFFECTIVITY
CHAPTER 00			
L.E.P. 1- 1		REVISED TO REFLECT THIS REVISION INDICATING NEW,REVISED, AND/OR DELETED PAGES	
00-INTRO 1- 4		AIRCRAFT TABLE UPDATED	ALL

CHAPTER 00

INTRODUCTION

LIST OF EFFECTIVE PAGES

N, R or D indicates pages which are New, Revised or Deleted respectively
Remove and insert the affected pages and complete the Record of Revisions and the Record of Temporary Revisions as necessary

CH/SE/SU	C	PAGE	DATE
RECORD OF REV.			
RECORD OF TEMP. REVISION			
LIST OF CHAPTERS			
L.E.P.	R	1- 1	May01/08
T. of C.		1	May01/07
00-INTRO	R	1	May01/08
00-INTRO	R	2	May01/08
00-INTRO	R	3	May01/08
00-INTRO	R	4	May01/08
00-INTRO		5	Aug01/02
00-INTRO		6	Aug01/02
00-INTRO		7	Aug01/02
00-INTRO		8	Aug01/02
00-INTRO		9	Aug01/02
00-INTRO		10	Aug01/02
00-INTRO		11	Aug01/02
00-INTRO		12	Feb01/05
00-INTRO		13	Feb01/05
00-INTRO		14	Aug01/07
00-INTRO		15	May01/07
00-INTRO		16	May01/07
00-INTRO		17	May01/07
00-INTRO		18	May01/07
00-INTRO		19	May01/07
00-INTRO		20	May01/07
00-INTRO		21	May01/07
00-INTRO		22	May01/07
00-INTRO		23	May01/07
00-INTRO		24	May01/07
00-INTRO		25	May01/07
00-INTRO		26	May01/07
00-INTRO		27	May01/07
00-INTRO		28	May01/07
00-INTRO		29	May01/07
00-INTRO		30	May01/07
00-INTRO		31	May01/07
00-INTRO		32	May01/07
00-INTRO		33	May01/07
00-INTRO		34	May01/07
00-INTRO		35	May01/07
00-INTRO		36	May01/07
00-INTRO		37	May01/07
00-INTRO		38	May01/07
00-INTRO		39	May01/07
00-INTRO		40	May01/07
00-INTRO		41	May01/07
00-INTRO		42	May01/07
00-INTRO		43	May01/07
00-INTRO		44	May01/07
00-INTRO		45	May01/07
00-INTRO		46	May01/07
00-INTRO		47	Feb01/08
00-INTRO		48	May01/07
00-INTRO		49	May01/07
00-INTRO		50	May01/07
00-INTRO		51	May01/07
00-INTRO		52	May01/07
00-INTRO		53	May01/07
00-INTRO		54	May01/07
00-INTRO		55	May01/07
00-INTRO		56	May01/07
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00-INTRO		69	May01/07
00-INTRO		70	May01/07
00-INTRO		71	May01/07
00-INTRO		72	May01/07
00-INTRO		73	May01/07
00-INTRO		74	May01/07
00-INTRO		75	May01/07
00-INTRO		76	May01/07
00-INTRO		77	May01/07
00-INTRO		78	May01/07
00-INTRO		79	May01/07
00-INTRO		80	May01/07
00-INTRO		81	May01/07
00-INTRO		82	Aug01/07
00-INTRO		83	Aug01/07
00-INTRO		84	Aug01/07
00-INTRO		85	Aug01/07
00-INTRO		86	Aug01/07
00-INTRO		87	Aug01/07
00-INTRO		88	Aug01/07
00-INTRO		89	Aug01/07
00-INTRO		90	Aug01/07
00-INTRO		91	Aug01/07
00-INTRO		92	Aug01/07
00-INTRO		93	Aug01/07
00-INTRO		94	Aug01/07

SROS

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CHAPTER 00

INTRODUCTION

TABLE OF CONTENTS

1. General

A. Trouble Shooting Manual (TSM) Objective

The TSM is provided by AIRBUS to enable the systematic identification, isolation and correction of aircraft warnings and malfunctions reported in flight and on the ground.

B. Effectivity Table

The aircraft identified by an AIRBUS Manufacturer Serial Number (MSN) in the effectivity table are covered in this current TSM issue.

VER: indicates the Aircraft VERsion within the customer fleet.
Example: CXN01 corresponds to the first customer version.

STD: Stands for Standard, it corresponds to a production standard for a given range of aircraft technical definition (e.g.: ST1, ST2, etc.).

Version Rank: indicates the "Rank" within the Customer versions.
Example: CXN02 0001, corresponds to first aircraft within the second customer version.

NOTE : The standard number and version rank may be useful when consulting/using the SRM and/or the aircraft drawing set.

	VER	RESTRICT. EFFECT.	MODEL	STD	ENGINE	OPERATOR
	AUA01	0476-0478	321-111	ST2	CFM56-5B1	AUSTRIAN AIRLINES
	AUA02	0426-0450	320-214	ST1	CFM56-5B4/P	AUSTRIAN AIRLINES
	AUA03	0479-0480	321-211	ST2	CFM56-5B3	AUSTRIAN AIRLINES
	AUA04	0481-0499	321-211	ST2	CFM56-5B3/P	AUSTRIAN AIRLINES
	AUA05	0451-0475	319-112	ST3	CFM56-5B6	AUSTRIAN AIRLINES
	AUA05	0451-0475	319-112	ST3	CFM56-5B6/P	AUSTRIAN AIRLINES
	EDW01	0701-0749	320-214	ST1	CFM56-5B4/P	EDELWEISS AIR AG
	I2L22	0254-0275	320-214	ST1	CFM56-5B4/P	SWISS INT'L AIR LINES
	SAB01	0503-0549	321-211	ST2	CFM56-5B3	KIBRIS TURK HAVA YOLLARI LT
	SAB02	0551-0599	319-112	ST3	CFM56-5B6	BLUE MOON AVIATION
R	SAB02	0551-0599	319-112	ST3	CFM56-5B6	BRUSSELS AIRLINES
R	SAB02	0551-0599	319-112	ST3	CFM56-5B6	KHALIFA AIRWAYS
R	SAB02	0551-0599	319-112	ST3	CFM56-5B6	MERIDIANA SPA
R	SAB02	0551-0599	319-112	ST3	CFM56-5B6	NATIONAL AIR SERVICES
	SAB02	0551-0599	319-112	ST3	CFM56-5B6/P	MEXICANA DE AVIACION
	SWR01	0276-0299	321-111	ST2	CFM56-5B1	AIR MEDITERRANEE
	SWR01	0276-0299	321-111	ST2	CFM56-5B1	SWISS INT'L AIR LINES
	SWR01	0276-0299	321-211	ST2	CFM56-5B3/3	AIR MEDITERRANEE
	SWR02	0227-0227	320-214	ST1	CFM56-5B4	SWISS INT'L AIR LINES
R	SWR02	0229-0245	320-214	ST1	CFM56-5B4	MEXICANA DE AVIACION

	VER	RESTRICT. EFFECT.	MODEL	STD	ENGINE	OPERATOR
R	SWR02	0229-0245	320-214	ST1	CFM56-5B4	SWISS INT'L AIR LINES
R	SWR02	0229-0245	320-214	ST1	CFM56-5B4/P	SWISS INT'L AIR LINES
R	SWR02	0229-0245	320-214	ST1	CFM56-5B4/P	TRANSPORTES AEREOS PORTUGUE
R						
	SWR03	0201-0225	319-112	ST3	CFM56-5B6	SWISS INT'L AIR LINES
	SWR03	0201-0225	319-112	ST3	CFM56-5B6	TRANSPORTES AEREOS PORTUGUE
	SWR03	0201-0225	319-112	ST3	CFM56-5B6/P	AIR IVOIRE, SOCIETE
R	SWR04	0246-0253	320-214	ST1	CFM56-5B4/P	INTERJET

Fleet No./MSN Cross-reference table

	AIRLINE	CUSTOMER FLEET SERIAL NUMBER	VERSION RANK	MODEL	MSN	REGISTRATION
	SROS	0201	SWR03 0001	319-112	0578	HB-IPV
	SROS	0202	SWR03 0002	319-112	0588	F-OOUA
	SROS	0203	SWR03 0003	319-112	0612	HB-IPX
	SROS	0204	SWR03 0004	319-112	0621	HB-IPY
	SROS	0205	SWR03 0005	319-112	0629	CS-TTQ
	SROS	0206	SWR03 0006	319-112	0713	HB-IPU
	SROS	0207	SWR03 0007	319-112	0727	HB-IPT
	SROS	0208	SWR03 0008	319-112	0734	HB-IPS
	SROS	0209	SWR03 0009	319-112	1018	HB-IPR
R	SROS	0227	SWR02 0002	320-214	0545	HB-IJB
R	SROS	0229	SWR02 0004	320-214	0553	HB-IJD
R	SROS	0230	SWR02 0005	320-214	0559	HB-IJE
	SROS	0231	SWR02 0006	320-214	0562	HB-IJF
	SROS	0232	SWR02 0007	320-214	0566	XA-MXF
	SROS	0233	SWR02 0008	320-214	0574	HB-IJH
	SROS	0234	SWR02 0009	320-214	0577	HB-IJI
	SROS	0235	SWR02 0010	320-214	0585	HB-IJJ
	SROS	0236	SWR02 0011	320-214	0596	HB-IJK
	SROS	0237	SWR02 0012	320-214	0603	HB-IJL
	SROS	0238	SWR02 0013	320-214	0635	HB-IJM
	SROS	0239	SWR02 0014	320-214	0643	HB-IJN
	SROS	0240	SWR02 0015	320-214	0673	HB-IJO
	SROS	0241	SWR02 0016	320-214	0681	HB-IJP
	SROS	0242	SWR02 0017	320-214	0701	HB-IJQ
	SROS	0243	SWR02 0018	320-214	0703	HB-IJR
	SROS	0244	SWR02 0019	320-214	0782	HB-IJS
	SROS	0245	SWR02 0020	320-214	0870	CS-TQD
	SROS	0247	SWR04 0002	320-214	1132	XA-IJT
	SROS	0248	SWR04 0003	320-214	1162	XA-INJ
	SROS	0249	SWR04 0004	320-214	1179	XA-AIJ
	SROS	0250	SWR04 0005	320-214	1244	XA-IJA
	SROS	0251	SWR04 0006	320-214	1259	XA-ITJ
	SROS	0252	SWR04 0007	320-214	1308	XA-ALM

AIRLINE	CUSTOMER FLEET SERIAL NUMBER	VERSION RANK	MODEL	MSN	REGISTRATION
SROS	0253	SWR04 0008	320-214	1322	XA-ACO
SROS	0254	I2L22 0001	320-214	1951	HB-IJU
SROS	0255	I2L22 0002	320-214	2024	HB-IJV
SROS	0256	I2L22 0003	320-214	2134	HB-IJW
SROS	0276	SWR01 0001	321-111	0517	F-GYAP
SROS	0277	SWR01 0002	321-111	0519	F-GYAZ
SROS	0278	SWR01 0003	321-111	0520	HB-IOC
SROS	0279	SWR01 0004	321-111	0522	HB-IOD
SROS	0280	SWR01 0005	321-111	0535	F-GYAN
SROS	0281	SWR01 0006	321-111	0541	HB-IOF
SROS	0282	SWR01 0007	321-111	0642	F-GYAO
SROS	0283	SWR01 0008	321-111	0664	HB-IOH
SROS	0284	SWR01 0009	321-211	0827	F-GYAQ
SROS	0285	SWR01 0010	321-211	0891	F-GYAR
SROS	0286	SWR01 0011	321-111	0987	HB-IOK
SROS	0287	SWR01 0012	321-111	1144	HB-IOL
SROS	0426	AUA02 0001	320-214	0768	OE-LBN
SROS	0427	AUA02 0002	320-214	0776	OE-LBO
SROS	0428	AUA02 0003	320-214	0797	OE-LBP
SROS	0429	AUA02 0004	320-214	1137	OE-LBQ
SROS	0430	AUA02 0005	320-214	1150	OE-LBR
SROS	0431	AUA02 0006	320-214	1189	OE-LBS
SROS	0432	AUA02 0007	320-214	1387	OE-LBT
SROS	0433	AUA02 0008	320-214	1478	OE-LBU
SROS	0451	AUA05 0001	319-112	2131	OE-LDA
SROS	0452	AUA05 0002	319-112	2174	OE-LDB
SROS	0453	AUA05 0003	319-112	2262	OE-LDC
SROS	0454	AUA05 0004	319-112	2416	OE-LDD
SROS	0455	AUA05 0005	319-112	2494	OE-LDE
SROS	0456	AUA05 0006	319-112	2547	OE-LDF
SROS	0457	AUA05 0007	319-112	2652	OE-LDG
SROS	0476	AUA01 0001	321-111	0552	OE-LBA
SROS	0477	AUA01 0002	321-111	0570	OE-LBB
SROS	0478	AUA01 0003	321-111	0581	OE-LBC
SROS	0479	AUA03 0001	321-211	0920	OE-LBD
SROS	0480	AUA03 0002	321-211	0935	OE-LBE
SROS	0481	AUA04 0001	321-211	1458	OE-LBF
SROS	0503	SAB01 0003	321-211	1012	TC-KTY
SROS	0551	SAB02 0001	319-112	1048	EI-DFP
SROS	0553	SAB02 0003	319-112	1086	F-OHJX
SROS	0554	SAB02 0004	319-112	1102	EI-DEY
SROS	0555	SAB02 0005	319-112	1124	F-OHJY
SROS	0557	SAB02 0007	319-112	1160	OO-SSG
SROS	0559	SAB02 0009	319-112	1283	EI-DEZ
SROS	0560	SAB02 0010	319-112	1305	EI-DFA
SROS	0561	SAB02 0011	319-112	1336	OO-SSK
SROS	0563	SAB02 0013	319-112	1388	OO-SSM
SROS	0564	SAB02 0014	319-112	1429	N429MX

AIRLINE	CUSTOMER FLEET SERIAL NUMBER	VERSION RANK	MODEL	MSN	REGISTRATION
SROS	0565	SAB02 0015	319-112	1494	N320NP
SROS	0701	EDW01 0001	320-214	0942	HB-IHX
SROS	0702	EDW01 0002	320-214	0947	HB-IHY
SROS	0703	EDW01 0003	320-214	1026	HB-IHZ

2. TSM Organization and Content

A. General

The TSM contains the following main parts:
- Front matter
- Index of Warnings/Malfunctions
- Index of CFDS Fault Messages
- Introduction
- Standard chapters.

The organization and content of these is as follows:

B. Front Matter

The front matter contains information on the revision status, management of pages and updating records for the TSM. The layout is as follows:

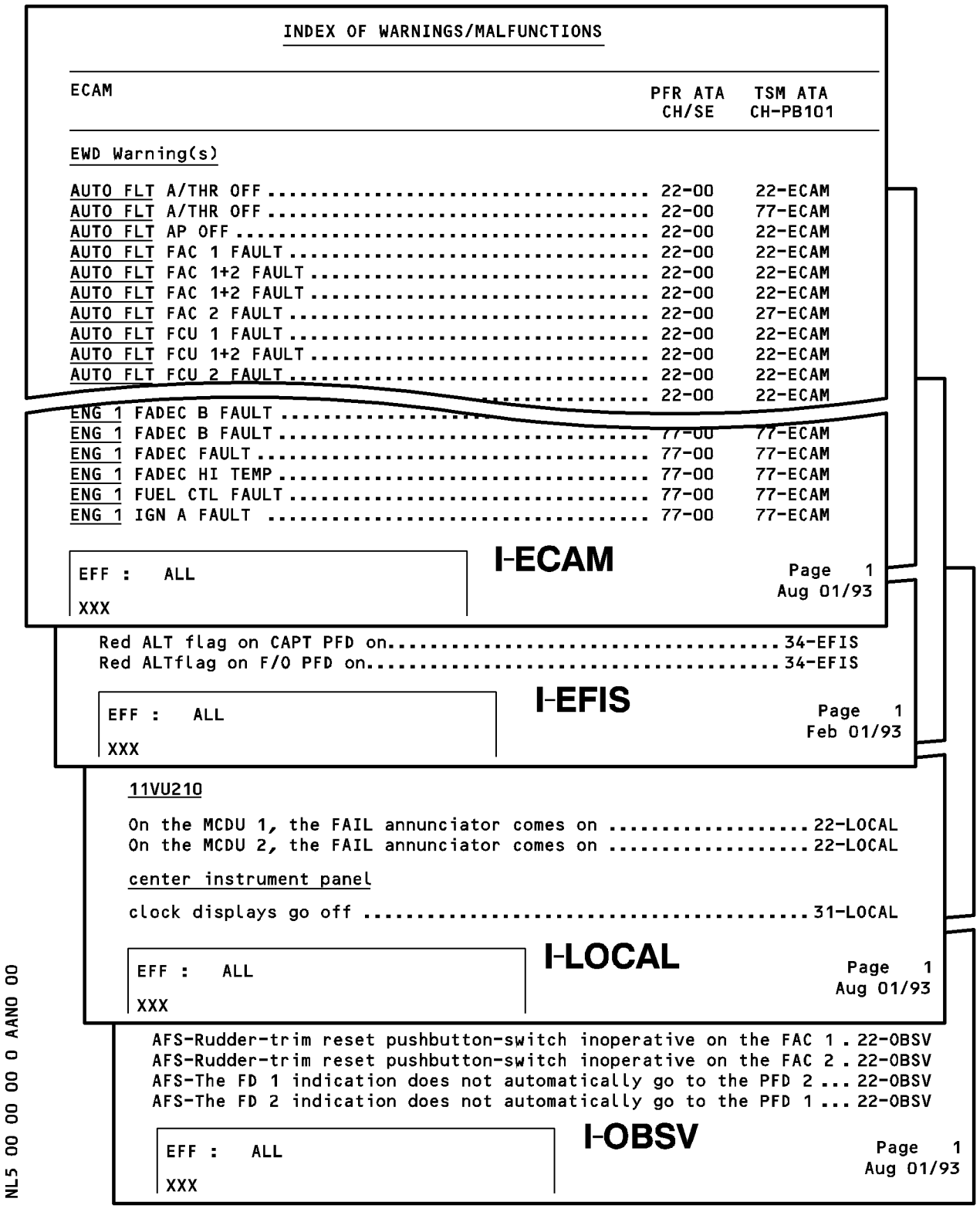
- Registration Card
- Title Page
- Record of Revisions
- List of Temporary Revisions
- Record of SBs (Service Bulletins)
- List of COCs (Customer Originated Changes)
- List of Chapters.

C. Index of Warnings/Malfunctions

(Ref. Fig. 001)
The index is automatically generated from the warnings and malfunctions listed in the standard chapters of the TSM. It is divided into the following four sections:

- I-ECAM (ECAM warnings)
- I-EFIS (Electronic Flight Instrument System flags)
- I-LOCAL (Local warnings)
- I-OBSV (Crew and/or maintenance observations).

These sections are also sub-divided into various types of warnings or malfunctions in order to correspond with the divisions of the Fault Symptom pages (P. Block 101), Ref. Para. 2.F.(4).
The index pages are divided into three columns. The first column contains warnings and malfunctions. The second, only for I-ECAM gives the ATA Ref of the Post Flight Report and the third gives a cross reference to the TSM chapter where the warning or malfunction can be found in the fault symptoms pages (P. Block 101).
The warnings and malfunctions are sorted alphanumerically to facilitate location in each of the sections and sub-divisions.



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Index of Warnings/Malfunctions
Figure 001

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D. Index of CFDS Fault Messages

(Ref. Fig. 002)
The index is automatically generated from the CFDS fault messages listed in the standard chapters of the TSM. Each page of the index is divided into five columns. The first four columns contain the fault message, ATA reference, source and class. The right column (CH-PB101) gives a cross reference to the TSM chapter where the fault message can be found in the fault symptoms pages (P. Block 101). The fault messages are sorted alphanumerically on the message text to facilitate location in the index.

E. Introduction

The introduction provides the following information:

- Organization and Content
- Philosophy and Use
- Centralized How to use the Centralized Fault Display System
- List of Abbreviations.

F. Standard Chapters

(1) General

Each of the standard chapters contains the following information:
- Front matter
  . Highlights
  . Record of Temporary Revisions
  . List of Effective Pages

- Table of Contents
- Fault Symptoms
- Fault Isolation Procedures
- Task Supporting Data

The contents of these is as follows:

(2) Front matter

The front matter contains information on the revision status and updating of the chapter.

(3) Table of Contents

It contains:
- the titles of P. Block 101, 201 and 301
- the titles of the tasks of P. Block 201.

INDEX OF CFDS FAULT MESSAGES

CFDS MESSAGES	ATA	SOURCE	CLASS	CH-PB101
ACCLRM 1 12CE1	279216	EFCS 1	2	27-ECAM
ACCLRM 1 12CE1	279216	EFCS 2	2	27-ECAM
ACCLRM 2 12CE2	279216	EFCS 1	2	27-ECAM
ACCLRM 2 12CE2	279216	EFCS 2	2	27-ECAM
ACCLRM 3 12CE3	279216	EFCS 1	2	27-ECAM
ACCLRM 3 12CE3	279216	EFCS 2	2	27-ECAM
ACCLRM 4 12CE4	279216	EFCS 1	2	27-ECAM
ACCLRM 4 12CE4	279216	EFCS 2	2	27-ECAM
ADIRU 1: NO ADIRU2 DATA	341234	IR 1	1	34-CFDS
ADIRU 1: NO ADIRU2 DATA	341234	IR 1	1	34-ECAM
ADIRU 1: NO ADIRU3 DATA	341234	IR 1	1	34-CFDS
ADIRU 1: NO ADIRU3 DATA	341234	IR 1	1	34-ECAM
ADIRU 1: NO FMGC1 DATA	228334	IR 1	1	22-CFDS
ADIRU 1: NO FMGC2 DATA	228334	IR 1	1	22-CFDS
ADIRU 2: NO ADIRU1 DATA	341234	IR 2	1	34-CFDS
ADIRU 2: NO ADIRU1 DATA	341234	IR 2	1	34-ECAM
ADIRU 2: NO ADIRU3 DATA	341234	IR 2	1	34-CFDS
ADIRU 2: NO ADIRU3 DATA	341234	IR 2	1	34-ECAM
ADIRU 2: NO FMGC1 DATA	228334	IR 2	1	22-CFDS
ADIRU 2: NO FMGC2 DATA	228334	IR 2	1	22-CFDS
ADIRU 3: NO ADIRU1 DATA	341234	IR 3	1	34-CFDS
ADIRU 3: NO ADIRU1 DATA	341234	IR 3	1	34-ECAM
ADIRU 3: NO ADIRU2 DATA	341234	IR 3	1	34-CFDS
ADIRU 3: NO FMGC1 DATA	228334	IR 3	1	22-CFDS
ADIRU 3: NO FMGC2 DATA	228334	IR 3	1	22-CFDS
ADR1	341234	EFCS 1	2	34-ECAM
ADR1 BUS 2	341234	EFCS 1	2	34-ECAM
ADR1 BUS 2	341234	EFCS 2	2	34-ECAM
ADR1 BUS 3	341234	EFCS 1	2	34-ECAM
ADR1 BUS 3	341234	EFCS 2	2	34-ECAM
ADR2 BUS 2	341234	EFCS 1	2	34-ECAM
ADR2 BUS 2	341234	EFCS 2	2	34-ECAM
ADR2 OR BUS 3 TO ELAC1	341234	EFCS 1	2	27-ECAM
ADR2 OR BUS 3 TO ELAC1	341234	EFCS 2	2	27-ECAM
ADR2 OR BUS 3 TO ELAC1	341234	EFCS 2	2	34-ECAM
ADR3 BUS 2	341234	EFCS 1	2	34-ECAM
ADR3 BUS 2	341234	EFCS 2	2	34-ECAM
ADR3 BUS 3	341234	EFCS 1	2	34-ECAM
ADR3 BUS 3	341234	EFCS 2	2	34-ECAM
AFS: ADIRU1	341234	AFS	1	22-ECAM
AFS: ADIRU1	341234	AFS	1	34-ECAM
AFS: ADIRU2	341234	AFS	1	22-ECAM
AFS: ADIRU2	341234	AFS	1	34-ECAM
AFS: ADIRU3	341234	AFS	1	22-ECAM
AFS: ADIRU3	341234	AFS	1	34-ECAM
AFS: CHECK FAC1 RT	226634	AFS	1	22-CFDS
AFS: CHECK FAC1 YD	226634	AFS	1	22-CFDS

EFF : ALL

XXX

I-CFDS

Page 1
Aug 01/93

NL5 00 00 00 0 ABNO 00

Index of CFDS Fault Messages
Figure 002

(4) Fault Symptoms

(Ref. Fig. 003)
The fault symptoms (P. Block 101) list all possible warnings, malfunctions and CFDS fault messages for each TSM chapter.
A Fault Symptom is the association of a Warning/Malfunction and/or CFDS fault message.
The Fault Symptom pages are located at chapter level and are divided into following five separate sections:
- XX-ECAM,
- XX-EFIS,
- XX-LOCAL,
- XX-OBSV (observations),
- XX-CFDS.

NOTE : XX = chapter ATA reference.

The division of the sections is identical to that of the Index of Warnings/Malfunctions and the Index of CFDS Fault Messages.
The Fault Symptom pages in each section are divided into the following three main columns:
- WARNINGS/MALFUNCTIONS,
- CFDS FAULT MESSAGES,
- FAULT ISOLATION PROCEDURE.

The contents of these is as follows:

The WARNING/MALFUNCTION column is divided into blocks in most sections in accordance with the priority classification of warnings and malfunctions as follows:

ECAM Section

- Upper ECAM DU warnings,
- STS (Status) inop system,
- STS (Status) maintenance,
- Lower ECAM DU flags,
- Lower ECAM DU advisories;

EFIS Section

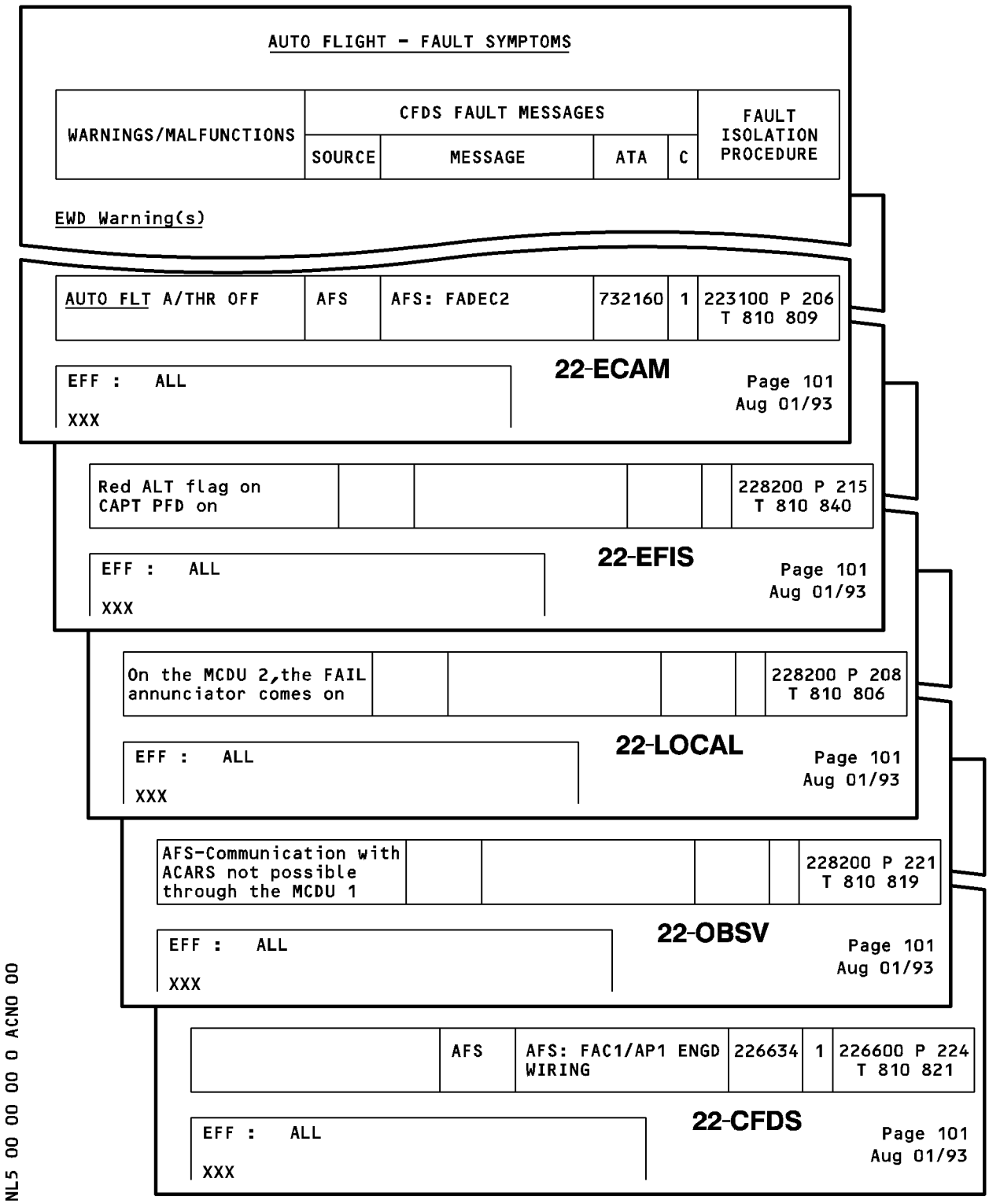
- PFD (Primary Flight Display) flags
- ND (Navigation Display) Flags

LOCAL Section

- annunciator lights
- indicators

These are sub-divided into the various panels on which they are located.

OBSV Section



NL5 00 00 00 0 ACNO 00

Example Fault Symptoms P. Block 101
Figure 003

EFF : ALL

R

SROS

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This covers crew and/or maintenance observations (malfunctions) which are generally not monitored by the aircraft systems and is not divided into blocks.

CFDS Section

The column is left blank as this section contains only CFDS Fault Messages which do not have a warning or malfunction associated with them.

The CFDS FAULT MESSAGE column lists the complete message (source, text, ATA reference, class and system identifiers) which is associated (if applicable) with a warning or malfunction. In the CFDS section all the CFDS fault messages which are not associated with a warning or malfunction are listed.
The FAULT ISOLATION PROCEDURE column gives the ATA reference, page number, configuration (if applicable) and AMTOSS task number of the fault isolation procedure in page block 201 which is associated with the fault symptom.

The fault symptoms are sorted alphanumerically to facilitate location within the priority classifications.

(5) Fault Isolation Procedures

(Ref. Fig. 004)
The Fault Isolation Procedures (P. Block 201) contain the information required to isolate and correct each fault symptom (Ref. Para. 2.F.(4)).
They are similar in structure to the Aircraft Maintenance Manual (AMM) maintenance procedures and are considered as maintenance tasks.
The breakdown of each procedure is as follows:
- Fault identification (procedure title)
- 1. Possible Causes
- 2. Job Set-up Information
- 3. Fault Confirmation
- 4. Fault Isolation
- 5. Close-up.

The contents of these is as follows:

(a) Possible Causes
This lists all the suspect items which are replaced or checked during the procedure.
The list is given to enable the collection of all items required to correct the fault and not for "shot-gun" trouble shooting. This form of trouble shooting is not recommended.
The list does not give details of wiring to be checked. This is detailed in the procedure and only mentioned in the list (eg: aircraft wiring).

PAPER/PDF LAYOUT

TASK 21-26-00-810-808

Monitoring Discrete Output to Extract Fan

1. Possible Causes

- FAN-EXTRACT, AVNCS VENT (7HQ)
- wiring between the pin C of the extract fan and the AEVC (2HQ)

2. Job Set-up Information

A. Referenced Information

REFERENCE	DESIGNATION
AMM 21-26-00-710-803	Operational Test of the Avionics-Equipment Ventilation System
AMM 21-26-51-000-804	Removal of the Extract Fan (7HQ)
AMM 21-26-51-400-804	Installation of the Extract Fan (7HQ)
ASM 21-26/01	

3. Fault Confirmation

A. Job Set-Up
Get Access
Open access door 821

B. Test

(1) Do the test of the avionics equipment ventilation (Ref. AMM TASK 21-26-00-710-803).

4. Fault Isolation

A. If the test gives the maintenance message EXTRACT FAN (7HQ)/AEVC (2HQ):

(1) Do a check to make sure that there is ground at the pin C of the extract fan.

(2) If there is ground, do a check of the wiring between the pin C of the extract fan and the AEVC (2HQ)(Ref.ASM 21-26/01).

(3) If there is no ground, replace the FAN-EXTRACT, AVNCS VENT (7HQ) (Ref. AMM TASK 21-26-51-000-804) and (Ref. AMM TASK 21-26-51-400-804).

B. Do the test given in Para. 3.B..

5. Close-up

A. Close Access

NL5 00 00 00 0 ADN0 01

R Example Fault Isolation Procedure
R Figure 004 (SHEET 1)

ELECTRONIC LAYOUT

** ON A/C ALL

TASK 21-63-00-810-805

TRIM-AIR PRESSURE REGULATING VALVE FAULT

1. POSSIBLE CAUSES
   - VALVE-PRESSURE REGULATING (14HK)
   - WIRING

2. JOB SET-UP INFORMATION
   A. REFERENCED INFORMATION

REFERENCE	DESIGNATION
AMM 21-63-00-710-004	OPERATIONAL TEST OF THE COCKPIT AND CABIN TEMPERATURE CONTROL WITH CFDS/MCDU
AMM 21-63-52-000-001	REMOVAL OF THE PRESSURE REGULATING VALVE 14HK
AMM 21-63-52-400-001	INSTALLATION OF THE PRESSURE REGULATING VALVE 14HK
ASM 21-63/01	
ASM 21-63/03	

3. FAULT CONFIRMATION
   A. DO THE OPERATIONAL TEST OF THE COCKPIT AND CABIN TEMPERATURE-CONTROL SYSTEM WITH CFDS/MCDU AMM TASK 21-63-00-710-004.

      NOTE: IF A FAULT IS DETECTED, THE ZC GIVES A FAULT CODE FOR SHOP MAINTENANCE IN ADDITION TO THE RELATED CFDS MESSAGE(S). FOR DETAILED INFORMATION SEE THE APPLICABLE PAGE BLOCK 301.

4. FAULT ISOLATION
   A. IF THE TEST GIVES THE MAINTENANCE MESSAGE TRIM AIR PRESS VALVE:
      - REPLACE THE VALVE-PRESSURE REGULATING (14HK) (REFERRED TO AS VALVE (14HK)) AMM TASK 21-63-52-000-001 AND AMM TASK 21-63-52-400-001.

      (1) IF THE FAULT CONTINUES:
          - DO A CHECK AND REPAIR THE WIRING ASM 21-63/01 AND ASM 21-63/03 FROM:
          - THE VALVE (14HK) TO THE ZC (8HK),
          - THE VALVE (14HK) TO GROUND AND,
          - THE VALVE (14HK) TO THE CB (3HK) VIA THE P/BSW (7HK).

   B. DO THE TEST AS GIVEN IN THE PARA. 3.A.

5. CLOSE-UP
   A. PUT THE AIRCRAFT BACK TO ITS INITIAL CONFIGURATION.

NL5 00 00 00 0 ADM0 00

R Example Fault Isolation Procedure
R Figure 004 (SHEET 2)

(b) Job Set-up Information
This lists any tools, equipment and procedures required to be carried out before commencing the fault isolation and is the same as the AMM job set-up.

(c) Fault Confirmation
Any test procedure needed to confirm that the fault is genuine is given here. This is to avoid unjustified LRU removals.
Confirmation tests of spurious warnings will also be covered, if applicable.

(d) Fault Isolation Procedure
The procedure gives the appropriate actions to isolate and correct the related fault symptom.
Before you get access for a wiring check, make sure that you obey the applicable warning(s):

WARNING:
PUT THE SAFETY DEVICES AND THE WARNING NOTICES IN POSITION BEFORE YOU START A TASK ON OR NEAR:
- THE FLIGHT CONTROLS
- THE FLIGHT CONTROL SURFACES
- THE LANDING GEAR AND THE RELATED DOORS
- COMPONENTS THAT MOVE.
MOVEMENT OF COMPONENTS CAN KILL OR INJURE PERSONS.

WARNING:
R **MAKE SURE THAT YOU DO THE DEACTIVATION OF THE THRUST REVERSER**
R **BEFORE YOU DO MAINTENANCE WORK ON OR AROUND THE THRUST REVERSER.**
IF YOU DO NOT DO THIS PROCEDURE, THERE IS A RISK OF UNWANTED OPERATION AND THUS OF INJURY TO PERSONS AND DAMAGE TO EQUIPMENT.

WARNING:
YOU MUST OBEY ALL THE SAFETY PROCEDURES WHEN YOU DO WORK IN OR NEAR THE FUEL TANK. IF YOU DO NOT OBEY THE SAFETY PROCEDURES, THERE IS A RISK OF:
- DEATH OR INJURY TO PERSONS
- DAMAGE TO THE AIRCRAFT OR OTHER EQUIPMENT.

Specific instructions for the wiring check are given where necessary. These include values (eg. resistance) and connector/pin numbers where applicable.
If no specific instructions are given for the wiring check, the check must include a continuity test (ESPM 20-52-21) and a test for short circuit (ESPM 20-52-22)

(e) Close-up
If it is necessary to return the A/C to its initial configuration after fault confirmation or fault isolation, the applicable procedure is given.

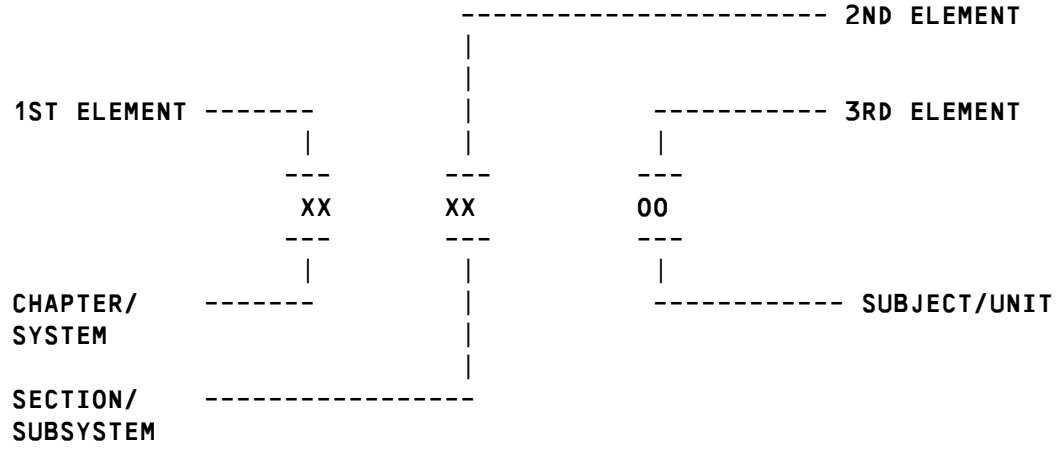
(6) Task Supporting Data (P. Block 301)

Task Supporting Data are given to show the system layout and interconnections with other systems.

G. Breakdown and Page Numbering

(1) Breakdown

The TSM is divided into chapters to provide a functional breakdown of systems in accordance with the Air Transport Association (ATA) Specification 100.
Each chapter is sub-divided into sections which are identified by a six digit number made up of three elements:



Each standard chapter takes its 1st element number from these ATA groups:

AIRFRAME SYSTEMS	(21 - 38, 49, 52)
STRUCTURE	(53, 57)
POWER PLANT	(70 - 80)

The chapters are separated by tab dividers to ease location of information.

(2) Page numbering

The numbering and breakdown level of the TSM pages is as follows:

SUBJECT	LEVEL			PAGES
	MAN	CH	CH-SE	
FRONT MATTER				
Registration Card	X			
Title Page	X			
Record of Revisions	X			
List of Temporary Revisions	X			1 to 99
List of SBs	x			1 to 99
List of COCs	X			1 to 99
List of Chapters	X			1 to 99
Index of Warnings/ Malfunctions	X			1 to 99
Index of CFDS Fault Messages	X			1 to 99
STANDARD CHAPTERS				
Highlights		X		1 to 99
Record of Temporary Revisions		X		1 to 99
List of Effective Pages		X		1 to 99
Table of Contents		X		1 to 99
Fault Symptoms		X		101 to 199
Fault Isolation Procedures			X	201 to 299
Task Supporting Data			X	301 to 399

H. Effectivity Statements

(1) Page effectivity block

The statement of effectivity in the effectivity block at the bottom left of each page corresponds to the sum of the effectivities included on the page. When a page applies to all aircraft of the operator fleet, the word "ALL" is given in the effectivity block.

(2) Effectivity in text

In the case of effectivity differences within the text, a statement of effectivity indicates the effectivity of the following text.

Example : ** ON A/C 001-003

EFF : ALL

R

SROS

(3) Effectivities of Service Bulletins

Service Bulletins are incorporated automatically in the TSM if at least one aircraft is potentially applicable and quoted in the Service Bulletin.

Example : ** ON A/C ALL
Post SB 29-1XXX For A/C 001-005

The above statement indicates that the information is potentially valid for ALL A/C. For A/C 001-005 the information is only valid after accomplishment of the SB. For A/C 006 and up the information is valid as the modification was embodied before delivery.

J. Publication Form

The TSM is published in paper form on ATA Specification No. 100 standard sized pages printed on both sides. Microfilm cartridges are also available.

K. Revision Service

The TSM is customized and subject to:
- Normal revisions
- Temporary Revisions (TR)
- Customer Originated Changes (COC).
  These are managed as follows:

(1) Normal revisions

Normal revisions for the paper manual consist of an issue of differential pages (those new or revised) at the specified revision date. These are managed at chapter level by:
- Highlights (HL)
- List of Effective Pages (LEP).

The Highlights provide the reasons for the revision of pages in each chapter (modification/SB incorporation etc.).
The LEP lists all pages valid for the chapter and their issue dates.
A revision code also indicates if each page is Revised (R), New (N), Deleted (D) or existing (no code).
The microfilm cassettes are filmed with the appropriate pages for the revision inserted.

(2) Temporary revisions

Temporary revisions are issued to introduce information which cannot wait until the next normal revision. They must be incorporated as stated on the TR transmittal sheet. However, only the temporary revisions deleted by the highlights of a normal revision must be removed.

IMPORTANT:
- Do not remove a temporary revision unless instructed to do so by:
  (1) the highlights of a normal revision
  or
  (2) a new temporary revision superseding the previous one.
- Update the Record of the TRs page accordingly.
- The normal revisions are accompanied by a list giving the temporary revisions which have been incorporated and the temporary revisions which still remain effective.

(3) Revision symbols

(a) Text revision
Revised or new text is indicated by a revision code (R) in the left margin, facing each added or modified line.

(b) Deleted text
A revision code (R) is given in the left margin, facing a blank line.

(4) Customer Originated Changes (COCs).

(a) COC Identification
COCs incorporated into the TSM at Customer request to reflect data or procedures originated by and peculiar to that specific customer, will be permanently identified by the COC reference number and by asterisks in the right hand margin on the indiviual pages (see example in the margin of this paragraph). The COC data incorporated into the Technical Data is shown in "POST" configuration only. *

(b) Responsibility
Where the Customer requests Airbus to incorporate the Customer's originated data or that of any other party into the technical data issued by Airbus ("Technical Data") relating to the operation, maintenance, overhaul, repair or modification of the aircraft, Airbus shall do so on the condition that the use of the COC data shall be entirely at the Customer's risk, Airbus being under no liability whatsoever in respect of either the contents of any COC data, or the effect which the incorporation of such COC data may have on the Technical data issued by Airbus.

(c) Disclaimer Clause
AIRBUS HEREBY EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, EXPRESSED OR IMPLIED, ORAL OR WRITTEN, ARISING BY LAW, COURSE OF DEALING, OR OTHERWISE, AND WITHOUT LIMITATION ALL WARRANTIES AS TO QUALITY, OPERATION, MERCHANTABILITY, FITNESS FOR ANY INTENDED PURPOSE, AND ALL OTHER CHARACTERISTICS WHATSOEVER, OF CUSTOMER ORIGINATED CHANGES INCORPORATED INTO THE TECHNICAL DATA ISSUED BY AIRBUS. THE FOREGOING DISCLAIMER SHALL ALSO APPLY TO ANY OTHER PORTION OF AIRBUS TECHNICAL DATA WHICH MAY BE AFFECTED BY SUCH CUSTOMER ORIGINATED CHANGES.

L. Requests for TSM Revision and Correspondence

(1) An RFI/RFR (Request For Information/Request For Revision) form is provided to expedite AIRBUS responses to TSM questions. It is requested that this form be used for any questions concerning the TSM.

(2) All communications concerning the TSM should be sent to:

AIRBUS S.A.S.
Technical Data Support and Services
1 Rond Point Maurice Bellonte
31707 Blagnac Cedex
France

M. Text Breakdown (AMTOSS) and Configurations

The fault isolation procedures can generally be considered as corrective maintenance tasks. Therefore, AMTOSS (Aircraft Maintenance Task Oriented Support System) has been applied to the TSM for the functional arrangement of the data. This also has the advantage of consistency with the AMM (Aircraft Maintenance Manual). Consequently, the fault isolation procedures are broken down into AMTOSS tasks and subtasks. The Task numbers are printed in the TSM and the subtask numbers are omitted (as an option, the subtask numbers can be printed). A brief description of the structure of Task numbers follows, for further information please refer to the AMM introduction.

ELEMENT	FUNCTION
1 to 3	ATA six digit number
4	This three digit numeric function code is used to indicate the particular function involved. For the TSM this is always 810.
5	This three digit numeral enables a unique identification task number to be allocated for all Tasks which are identically numbered throughout the preceding elements. Task idents begin at 801 and raise, in sequence, to 999 (maximum) within the P. Block. Illustrations and tables are considered as tasks.
6	This three digit alphanumeric indicator comprises of: - First digit alpha to indicate a different configuration (modification, service bulletin(s), etc.). - Second and third digit numerals to indicate alternative methods/techniques of trouble shooting

Example:

-78-31-00-810-801-A 01

This alpha digit- identifies a configuration (SB etc.).

These two numerical- digits identify a configuration of method/technique.

- Configurations due to different modification standard, Service Bulletin (SB) incorporation, etc.:

78-31-00-810-801-A
-

* this digit is blank when no configuration exists

ELEMENT	FUNCTION

* when subsequent configurations of criteria are incorporated, this digit changes as follows:
  78-31-00-810-801-A first configuration
  78-31-00-810-801-B second configuration
  78-31-00-810-801-C third configuration

- Configurations due to different methods/techniques for trouble shooting

78-31-00-810-801- 01
--

* these two digits are blank when only one maintenance configuration exists
* when there are several configurations of method, these digits change as follows:
  78-31-00-810-801- 01 first configuration
  78-31-00-810-801- 02 second configuration
  78-31-00-810-801- 03 third configuration

The method/technique configurations have always the same A/C effectivities. The deletion of one configuration does not change the three digit alphanumeric indicator of the remaining task(s).

NOTE: When a trouble shooting operation is completely different according to equipment design (example: Different vendor for a same equipment), the mention "Config." appears at the bottom of the page to differentiate all configurations.

7 A three digit alphanumeric indicator can be assigned by the airline to highlight unique airline data.

N. Warnings, Cautions and Notes

WARNING : CALLS ATTENTION TO USE OF MATERIALS, PROCESSES, METHODS, PROCEDURES OR LIMITS WHICH MUST BE FOLLOWED PRECISELY TO AVOID INJURY OR DEATH TO PERSONS.

CAUTION : CALLS ATTENTION TO METHODS AND PROCEDURES WHICH MUST BE FOLLOWED TO AVOID DAMAGE TO EQUIPMENT.

NOTE : Calls attention to methods which make the job easier or provide supplementary or explanatory information.

P. Functional Item Numbers (FIN)

The equipment on the A/C is identified by a unique identifier called a Functional Item Number (FIN). The basic element of the FIN is a two letter code indicating to which system/circuit the equipment belongs. To this code are added prefixes and/or suffixes which provide the unique identification for individual items of equipment.

For electrical equipment (any component with an electrical connection) the FIN is of the form 2CA1 where:
- 2 = Second component in circuit CA
- CA = Circuit two letter code
- 1 = Suffix - First of several similar systems (System 1)

NOTE : Several identical components which perform the same function in the same circuit can be differentiated by the suffix number. The general rule is that an even suffix identifies a component on the right hand side and an odd suffix identifies a component on the left hand side.

For mechanical equipment the FIN is of the form 3016GM where M = mechanical equipment and G = corresponding system.

3. Philosophy and Use

The Maintenance concept is based on the use of CFDS and TSM.
(Ref. Fig. 005)

NOTE : The aircraft is equipped with a high number of digital items of equipment. In most of the cases, computers may be recovered after an abnormal behaviour or a detected fault, either by a software reset (reset of microprocessor) or by interrupting the power supply of its processing parts for a short time.
This is achieved with the normal cockpit controls (engagement levers, pushbutton switches) by selecting the related control off then on or by action on the corresponding circuit breaker.

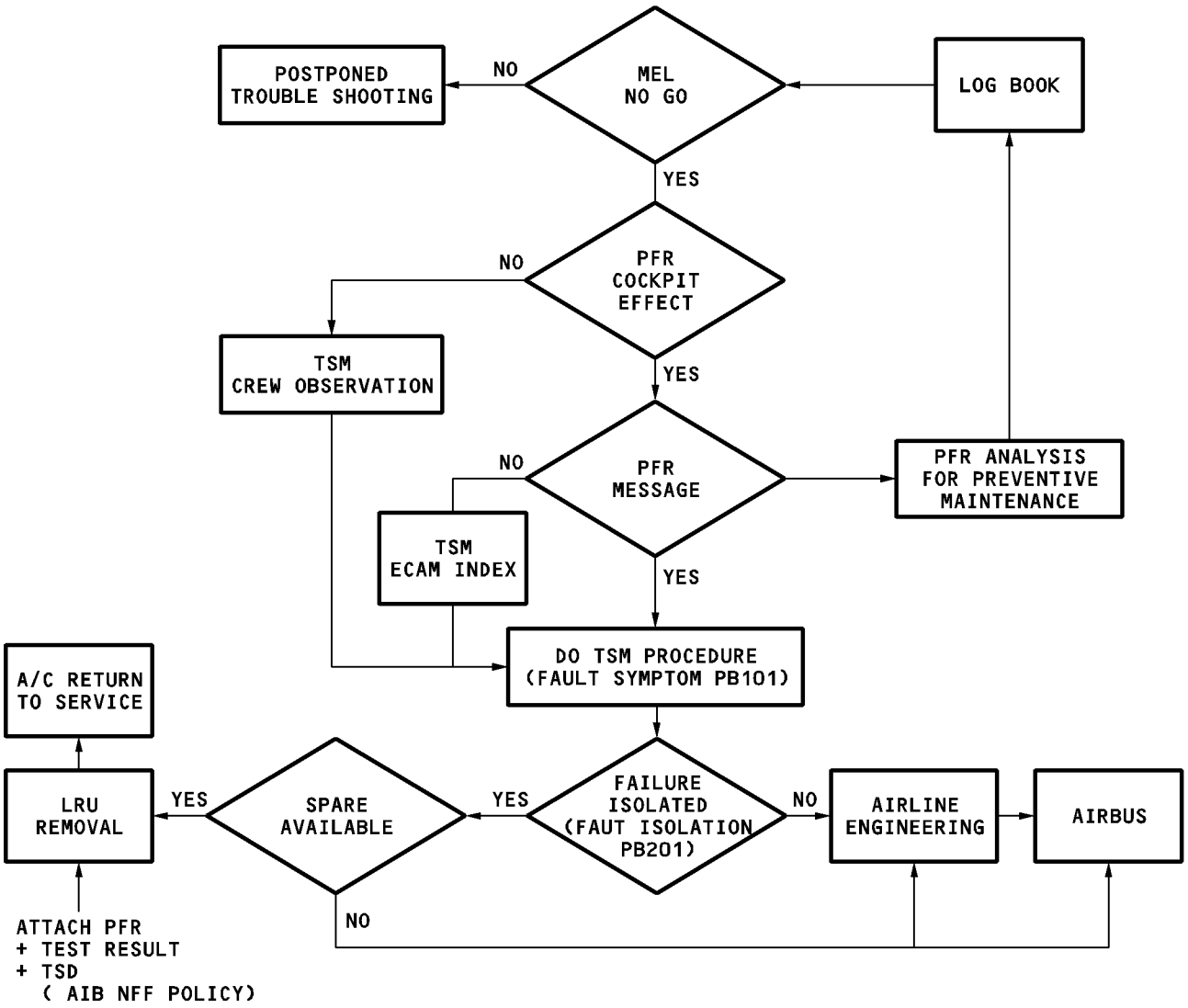
A. Philosophy

(1) TSM

The TSM provides coverage of all probable aircraft faults. This includes being a trouble shooting guide to faults monitored and displayed by the aircraft systems. Faults not monitored by the aircraft systems are also covered.

(2) CFDS

The objective of the CFDS is to provide an economic, efficient and easy-to-use means of maintaining the aircraft systems. To do this the CFDS directly monitors and identifies faulty Line Replaceable Units (LRUs) in the aircraft systems and displays items identified as faulty to the maintenance crew. This is essentially achieved by analysis of all cockpit events which are triggered by the monitoring of the aircraft systems. Refer to paragraph 4 for a description of the CFDS and how to use it.
The CFDS also takes into account a major objective of the line maintenance which is to avoid unjustified removals of equipment. For these reasons the CFDS makes a detailed analysis to identify the responsible LRUs; this is also to confirm that the event was actually due to a hardware failure and not an intermittent fault.
To achieve its purpose, the CFDS has several major functions which supply:
- A maintenance Post Flight Report (PFR) which is printed at the end of each flight. The PFR (Ref. Para. 4.E.(1)) allows association of ECAM warnings and CFDS maintenance messages.
- Directly usable maintenance messages which identify faulty LRUs.
- User-friendly access to tests of the aircraft systems.



MAINTENANCE LEVELS

1st LEVEL: LINE MAINTENANCE
LRU LEVEL ONLY
NO LOG-BOOK COMPLAINT ⟶ NO MAINTENANCE ACTION REQUIRED
LOG-BOOK COMPLAINT ⟶ PFR + SYSTEM REPORT/TEST + REFER TO MMEL

2nd LEVEL: NIGHT STOP
LRU LEVEL
MAINTENANCE STATUS ⟶ PFR(CLASS 2 FAULTS) + SYSTEM REPORT/TEST

3rd LEVEL: SCHEDULED CHECKS
LRU LEVEL
CLASS 3 FAULTS ⟶ INDIVIDUAL CLASS 3 REPORT + SYSTEM REPORT/TEST

4th LEVEL: SHOP MAINTENANCE
LRU LEVEL
LRU REMOVAL ⟶ TROUBLE SHOOTING DATA + BITE SHOP MEMORY

NL5 00 00 00 0 BAA0 02

Maintenance Concept - Trouble Shooting Decision Tree
Figure 005

B. How to Use the TSM
(Ref. Fig. 006)

(1) Types of faults

In the TSM faults are divided according to the way they are displayed on the aircraft. There are two general divisions of monitored and non-monitored faults.
Monitored faults are those which are monitored and displayed by the aircraft systems (mainly ECAM and CFDS). Non-monitored faults are not displayed by the aircraft systems and can be of a general nature, such as: "Nose landing gear doors slow to move".
Within each of these general divisions faults are divided according to the type of system and display:

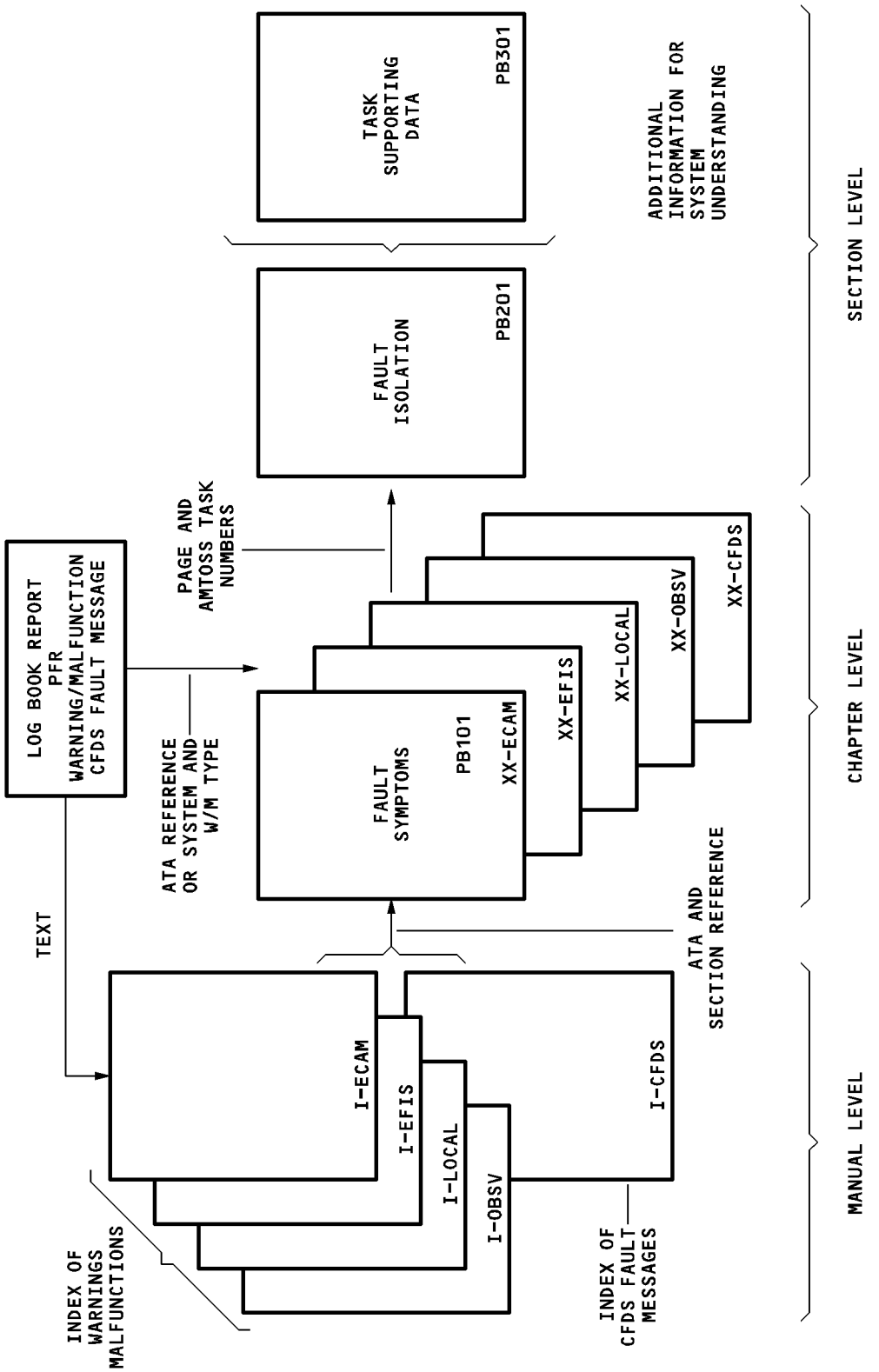
(a) Monitored faults:
- ECAM warnings
- EFIS flags
- local warnings
- CFDS fault messages.

(b) Non-monitored faults
- Crew and/or maintenance observations.

NOTE : All these types of fault are used as entry points into the TSM under the titles given above and are summarized in the appropriate indexes.

(2) Entry into the TSM

(Ref. Fig. 006)
Entry into a TSM trouble shooting procedure is initiated by a flight crew or maintenance crew report of a fault. The TSM can then be entered with the fault at the Fault Symptoms (P. Block 101), the Index of Warnings/Malfunctions, or the Index of CFDS Fault Messages - depending on the type of fault. From these pages the troubleshooter is directed to the procedure in P. Block 201 to isolate the fault.
Three types of monitored faults (ECAM, EFIS and local) reported by the flight crew are usually associated with CFDS fault messages. The association principle of a Warning Malfunction and a CFDS fault message is described in paragraph 4.E.(1)(b). For these the first two digits of the ATA reference given on the PFR are used to enter directly into the appropriate TSM chapter fault symptoms (P. Block 101).
CFDS fault messages are not normally reported by the flight crew and are used by maintenance crews. They can be displayed alone without an associated warning or malfunction, in which case they may be the entry point for maintenance related trouble shooting. TSM entry is via the appropriate TSM chapter fault symptoms (P. Block 101) using the ATA reference, or the Index of CFDS Fault Messages using the message text.



NL5 00 00 00 0 AFNO 01

Trouble Shooting Manual Entry
Figure 006

Crew or maintenance observations are usually a single fault without an associated CFDS fault message. TSM entry is via the appropriate TSM chapter fault symptoms (P. Block 101) if the system (ATA reference) is known, or the Index of Warnings/Malfunctions using the fault text.
Examples of trouble shooting these faults are given in the following trouble shooting examples.

C. Trouble Shooting Faults Reported on the PFR

(Ref. Fig. 007)
The following general procedure describes trouble shooting of Upper ECAM DU warnings, ECAM STS (Status) Maintenance messages or CFDS fault messages given on the PFR.

(1) Compare the ECAM warning or ECAM STS message with the CFDS fault message (if applicable) on the PFR to obtain the fault symptom and the ATA chapter reference. Alternatively, the user can find the ECAM warning or ECAM STS message alphanumerically in the I-ECAM section which will give the ATA chapter and section reference.

NOTE : A time difference of 1-3 minutes between the fault message and the warning message may occur due to CFDIU internal behaviour.

(2) Go to the ATA chapter, locate the correct section of the FAULT SYMPTOMS (page block 101), find the correct sub-division and fault, correlate the CFDS fault message and note the associated task and page number.

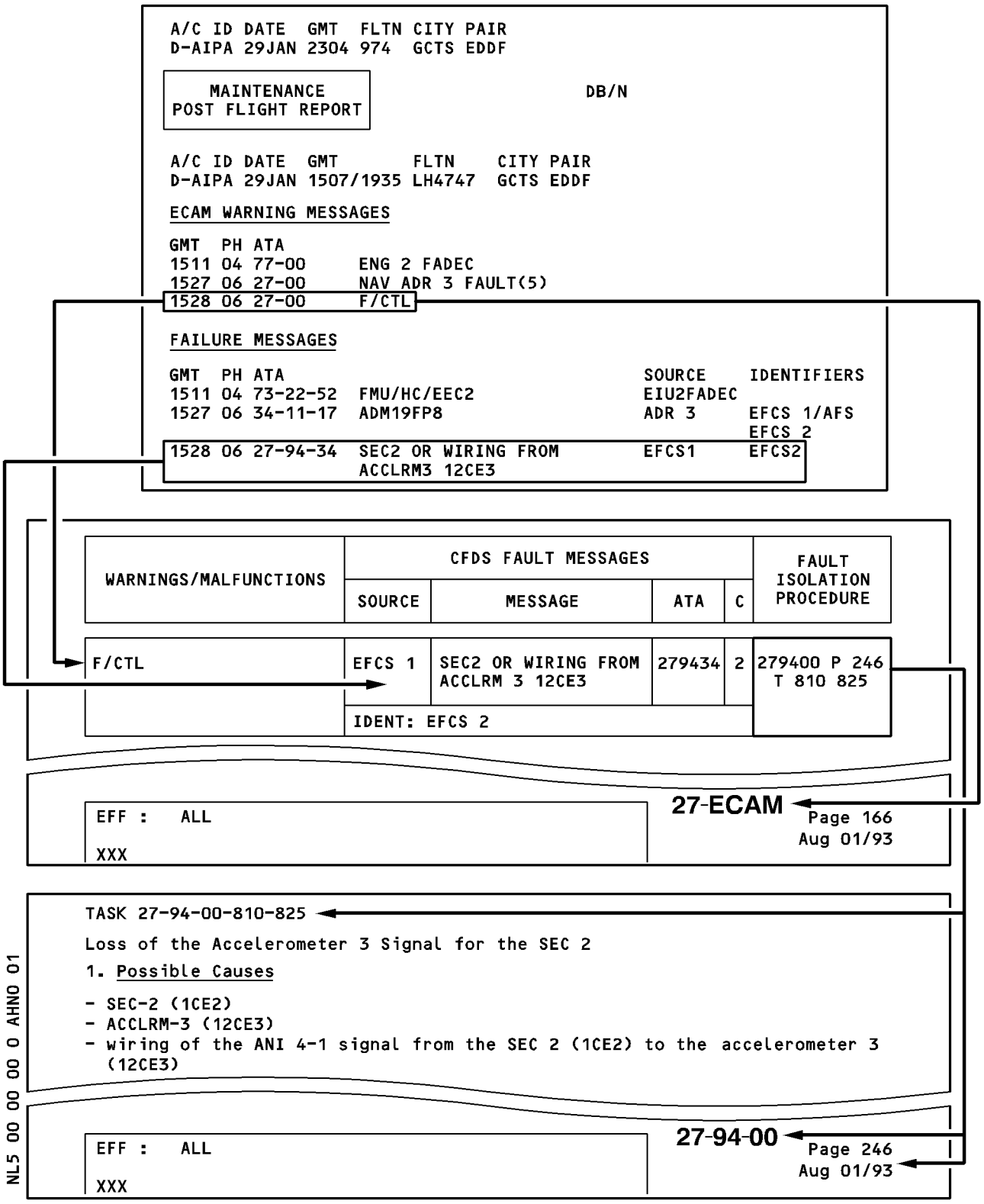
NOTE : For further fault isolation use the source (SOURCE column) and/or CFDS fault message identifiers (IDENT block). Due to the number of possible identifier, the fault message identifier in the TSM must be the same as on the PFR.

(3) Go to the FAULT ISOLATION PROCEDURES (P. Block 201) page number, confirm the task number (at the top left) and do the fault isolation procedure.

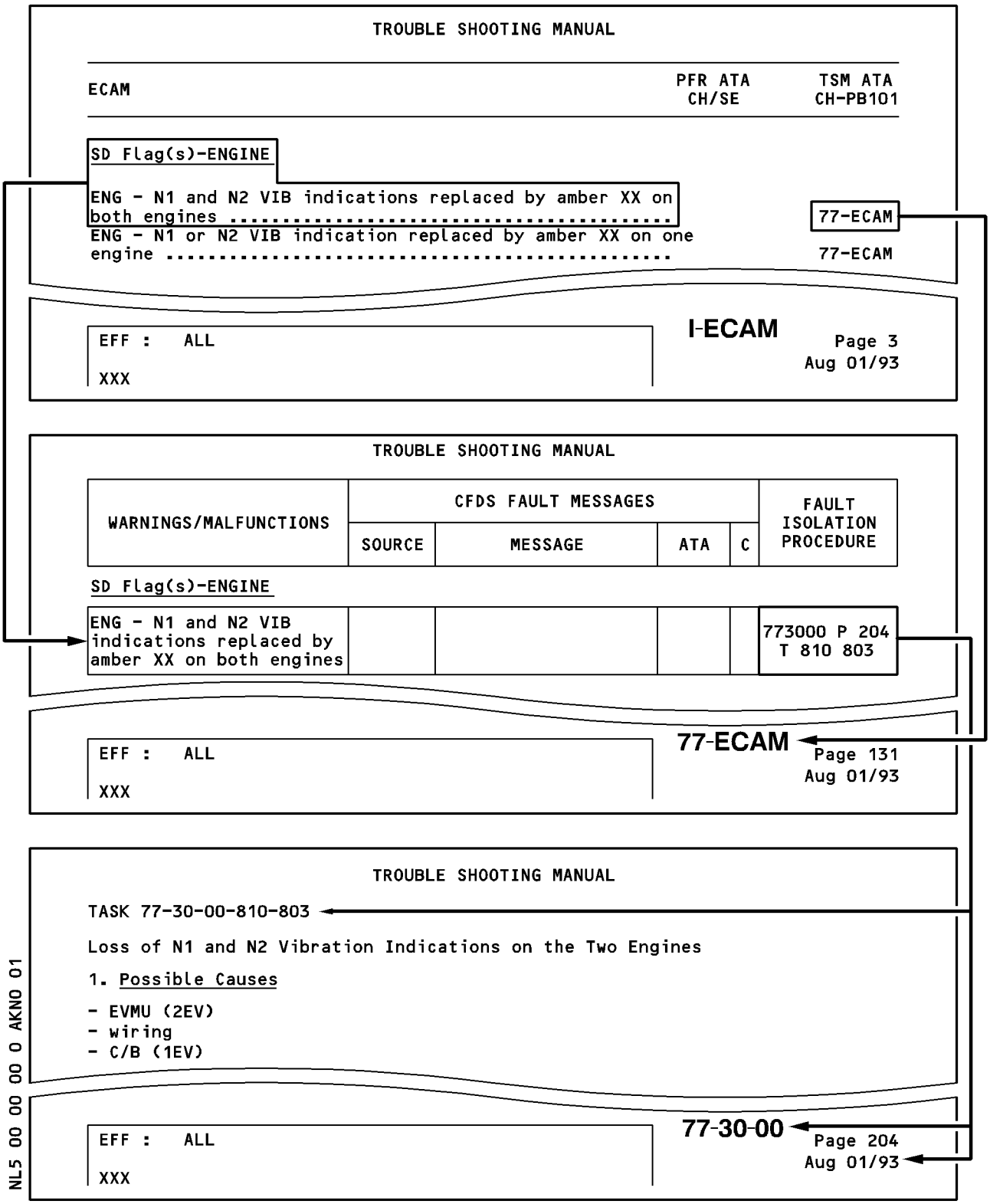
D. Trouble Shooting Faults not Reported on the PFR

(Ref. Fig. 008)
The following general procedure describes trouble shooting of Inop System messages, Lower ECAM DU flags/advisories, local warnings and crew or maintenance observations.

(1) Go to the appropriate section of the Index of Warnings and Malfunctions, find the text of the fault alphanumerically and note the ATA reference and section of the TSM chapter. Alternatively, if the user knows which system has generated the fault this step can be skipped and the trouble shooting started at the next text.



Trouble Shooting Faults Reported on the PFR
Figure 007



Trouble Shooting Faults not Reported on the PFR
Figure 008

(2) Go to the ATA chapter, locate the correct section of the FAULT SYMPTOMS (page block 101), find the correct sub-division (if applicable) and fault, correlate the CFDS fault message (if applicable) and note the associated task number and page number.

NOTE : For further fault isolation use the source (SOURCE column) and/or CFDS fault message identifiers (IDENT block).

(3) Go to the FAULT ISOLATION PROCEDURES (P. Block 201) page number, confirm the task number (at the top left) and do the fault isolation procedure.

E. Trouble Shooting CFDS Fault Messages

(Ref. Fig. 009)
The following general procedure describes trouble shooting of CFDS Fault Messages including class 3 messages. Class 3 Fault Messages are shown on the SYSTEM/REPORT TEST CLASS 3 FAULT pages.

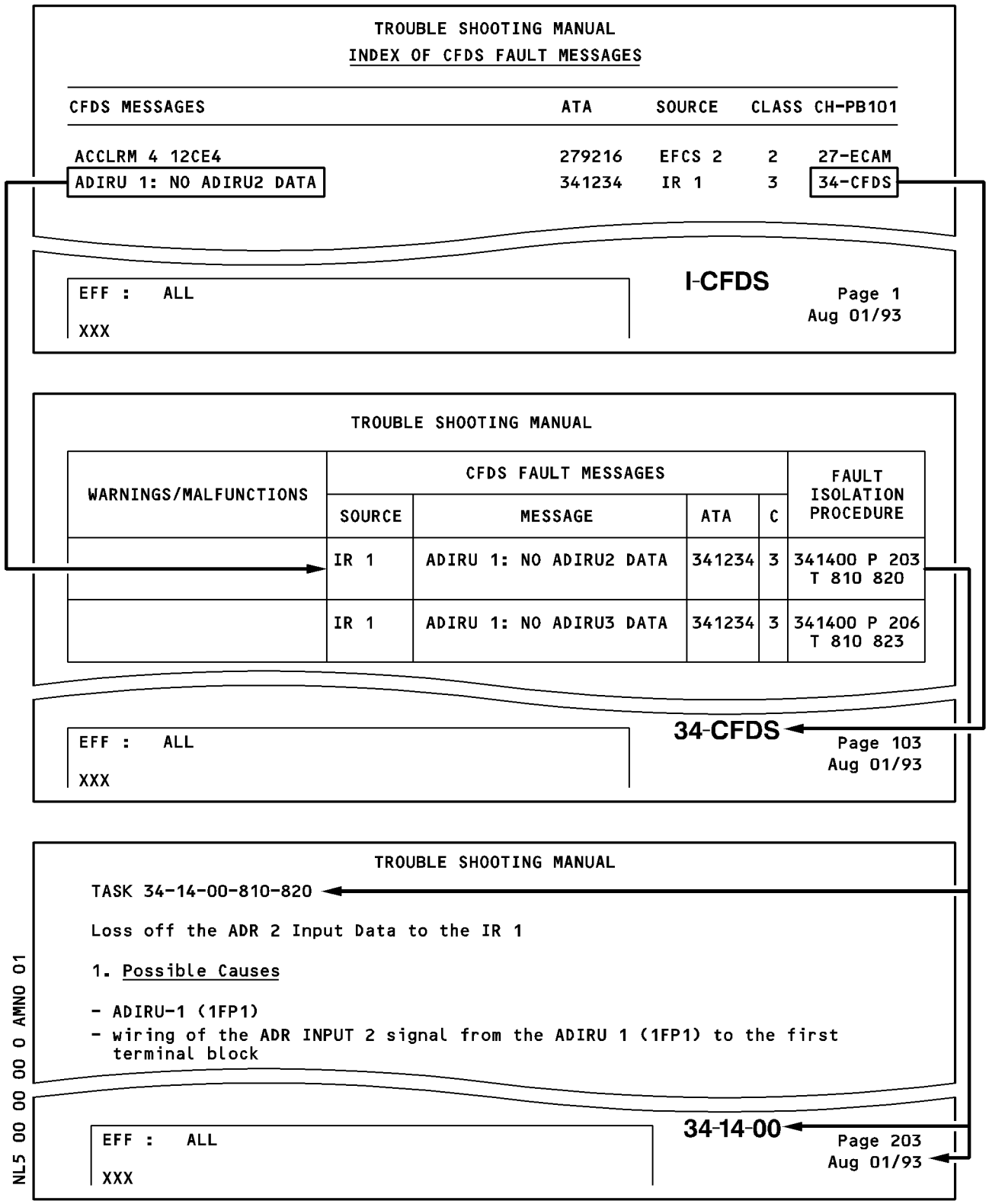
(1) Note the CFDS fault message ATA chapter reference.
Alternatively, the user can find the message alphanumerically in the Index of CFDS Fault Messages which gives the ATA chapter and section reference.

(2) Go to the ATA chapter CFDS section, find the message and note the associated task and page number.

(3) Go to FAULT ISOLATION PROCEDURES (page block 201) page number, confirm the task number (at the left) and do the fault isolation procedure.

F. Use of the Index of Warnings/Malfunctions and Index of CFDS Fault Messages

The indexes are provided mainly for additional information in situations where either the ATA reference, or system (chapter) of a warning, malfunction or CFDS fault message is not known. The indexes allow entry using the text of a warning, malfunction or CFDS fault message and are sorted alphanumerically to facilitate this.
In some cases it is possible for the trouble shooting to be covered in a chapter different to that of the ATA reference given by the warning, malfunction or CFDS fault message. In such a case the indexes are useful to direct the trouble shooter to the correct chapter.
Use of the indexes is explained in Entry into the TSM (Ref. Para 3.B.(2) and How to Use the TSM (Ref. Para. 3.B).



Trouble Shooting CFDS Fault Messages
Figure 009

G. Trouble Shooting Tips

Tips for using the various TSM page blocks and useful additional information are given in the following paragraphs:

(1) Fault symptoms (P. Block 101)
The primary fault only is given in the TSM to avoid confusion with too many associated faults.
The list of faults in the Fault Symptoms (P. Block 101) is customized by airline. This means that one fault symptom is effective for at least one aircraft in the fleet.

(a) APU Fault Symptom Peculiarities
(Ref. Fig. 010)
Whenever the operation of the APU may result in damage to the aircraft, the APU or the Electronic Control Box (ECB) of the APU, the ECB shuts down the APU automatically. The cause of the shutdown and associated LRUs are stored in the ECB memory. This information is available on the APU system related CFDS menu page APU SHUTDOWNS.

i.e. NO FLAME (shutdown cause)
IGNITION EXCITER P12 (faulty LRU)

In parallel the ECB generates a maintenance message with associated ATA Chapter and related Fault Class of the faulty LRU. This maintenance message is available on the Post Flight Report (PFR), which is, in the AIRBUS TSM philosophy, the entry point to the TSM.

i.e. ATA 494138
CLASS: 1
IGNITION EXCITER P12

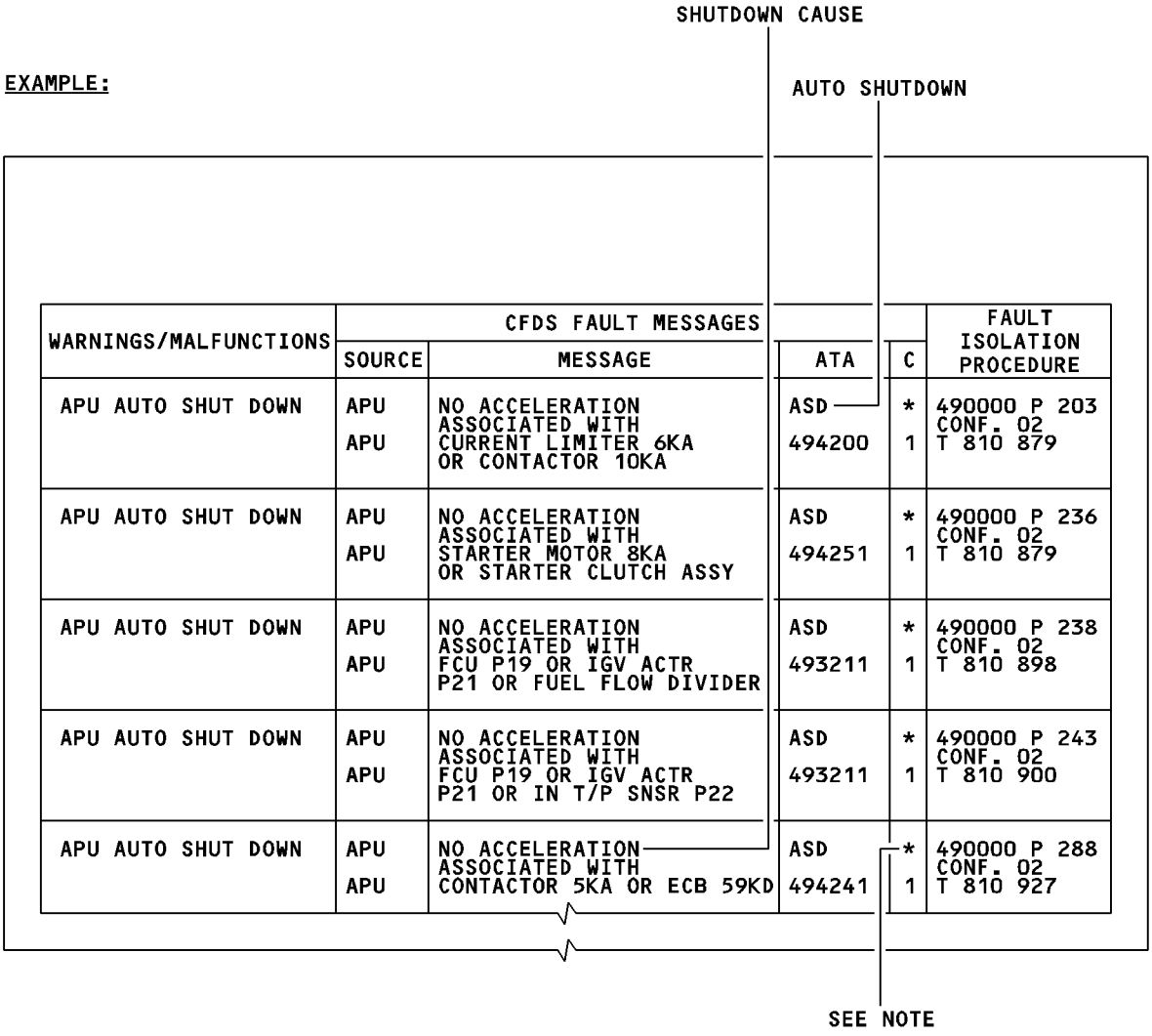
During several operator conferences concerning the APU TSM, it has been shown that likely most operators prefer enter into the TSM with the information of the APU SHUTDOWNS menu, which shows the same faulty LRU as the PFR but additionally the shutdown reason.
It has been decided to follow the operators preferences to combine the PFR maintenance message with the Shutdown cause in one Fault Symptom in TSM 49 P. Block 101:

i.e.

Source	Message	ATA	Class
ECB	NO FLAME	ASD	*
	associated with		
ECB	IGNITION EXCITER P12	494138	1

NOTE : The (*) shown in place of the class denotes that this fault/malfunction is also available in the CFDS APU shutdown menu with its associated shutdown cause.

EXAMPLE:



WARNINGS/MALFUNCTIONS	CFDS FAULT MESSAGES				FAULT ISOLATION PROCEDURE
	SOURCE	MESSAGE	ATA	C	
APU AUTO SHUT DOWN	APU APU	NO ACCELERATION ASSOCIATED WITH CURRENT LIMITER 6KA OR CONTACTOR 10KA	ASD 494200	* 1	490000 P 203 CONF. 02 T 810 879
APU AUTO SHUT DOWN	APU APU	NO ACCELERATION ASSOCIATED WITH STARTER MOTOR 8KA OR STARTER CLUTCH ASSY	ASD 494251	* 1	490000 P 236 CONF. 02 T 810 879
APU AUTO SHUT DOWN	APU APU	NO ACCELERATION ASSOCIATED WITH FCU P19 OR IGV ACTR P21 OR FUEL FLOW DIVIDER	ASD 493211	* 1	490000 P 238 CONF. 02 T 810 898
APU AUTO SHUT DOWN	APU APU	NO ACCELERATION ASSOCIATED WITH FCU P19 OR IGV ACTR P21 OR IN T/P SNSR P22	ASD 493211	* 1	490000 P 243 CONF. 02 T 810 900
APU AUTO SHUT DOWN	APU APU	NO ACCELERATION ASSOCIATED WITH CONTACTOR 5KA OR ECB 59KD	ASD 494241	* 1	490000 P 288 CONF. 02 T 810 927

NOTE: THE (*) IN THE 49-ECAM INDEX "C" COLUMN DENOTES THAT THIS FAULT/MALFUNCTION IS ALSO AVAILABLE IN THE CFDS APU SHUTDOWNS MENU WITH ITS ASSOCIATED SHUTDOWN CAUSE.

NL5 00 00 00 0 ANPO 00

Example of APU Fault Symptom Page
Figure 010

(2) Fault isolation procedures (P. Block 201)

(a) Possible Causes
This lists all the suspect items in the fault isolation procedure to allow assembly of all items required to fix the fault. It is not provided for "shotgun" trouble shooting.

(b) Fault confirmation

1 Permanent fault
The fault is confirmed on ground by performing the test required in the fault confirmation paragraph. Consequently, the procedure must be applied to troubleshoot the A/C.

2 Intermittent fault
(INTM) is added to the message when an intermittent operation of the system is detected.
Example of message :

NO BSCU DATA (INTM)

The fault is not confirmed on ground by performing the test required in the fault confirmation paragraph. Faults are sometimes generated by electrical transients or similar events without the aircraft system being faulty. If the confirmation test result is "**TEST OK**" or equivalent, no further action is required (unless specified in the fault isolation procedure). The aircraft may be dispatched. It is recalled that the **TSM** has been designed to isolate/troubleshoot hard faults. However depending on the airlines organization, the following can be applied "to trap" intermittent faults:
- if test **OK** (fault not confirmed) dispatch the aircraft,
  . then perform a monitoring of the reported symptom on the following flights by checking:
  * the previous leg reports
  * the **PFR**/Previous **PFRs** (if available)
  * the log book of the previous flights.
  . after **3** occurrences of the same phenomenon (even though the test is still **OK**), the other steps of the **TSM** procedure shall be followed and the **LRU** involved be removed.
  In this case, as for all **LRUs** removed from the aircraft, **AIRBUS** recommend to provide shop people or suppliers with data related to the removal: **PFR**, test result, trouble shooting data (if available).
- if test **NOT OK** (fault confirmed), apply the trouble shooting procedure.

(c) Fault isolation procedure

1 Do not replace (swap) **LRUs** as a trouble shooting step unless the **TSM** tells you to do so.
After carrying out the fault isolation in accordance with the **TSM**, to prevent a **NO GO** situation in the dispatch of the

aircraft when no spare is available, swapping of LRUs is permissible in accordance with operator policy.

CAUTION : IF YOU SWAP LRUs :
- **MAKE ONE SWAP AT A TIME**
- **DO NOT SUPPLY THE SUSPECT LRU WITH ELECTRICAL POWER WHEN INSTALLED IN ITS NEW POSITION**
- **FREQUENT DISCONNECTIONS AND CONNECTIONS CAN INCREASE THE RISK OF DAMAGE TO PLUGS AND RECEPTACLES.**

CAUTION : WHEN DOING FAULT ISOLATION ON ETOPS IMPORTANT SYSTEMS, IN ACCORDANCE WITH THE TSM, IT MAY REQUIRE THE SWAPPING OF LRUs. THE OPERATOR'S APPROVED MAINTENANCE PROCEDURES MUST BE FOLLOWED TO KEEP THE ETOPS STATUS OF THE AIRCRAFT.

2 The TSM does not give the action to be taken if a suspect unit removed from the aircraft during trouble shooting is found to be serviceable rather than failed. This is due to differing replacement policies of airlines on such units (reinstall, or send to the workshop). If such a situation occurs airline internal replacement policy shall be applied.

3 Continuity and isolation checks on LRUs and system wiring made on the equipment rack ARINC 600 connectors, should only be done with the use of a breakout box and test cables or equivalent.

4 After a fault isolation procedure action has been completed a check must be done to make sure that the reported fault has been corrected.

5 When an AMM LRU replacement procedure is referenced in the TSM, the AMM procedure usually specifies a test. This AMM test is to make sure that the replacement unit is installed correctly. It does not always confirm the correction of the fault symptom. In such a case the TSM refers to the appropriate operational or system test procedure.

6 Warnings about static sensitive devices may have to be used to prevent damage to sensitive devices.

7 On the ground, a tripped circuit breaker must not be engaged without trouble shooting of the associated system.

H. Trouble Shooting Summary

(Ref. Fig. 011)
The various possibilities for using the TSM are summarized in the flow chart in the following figure.

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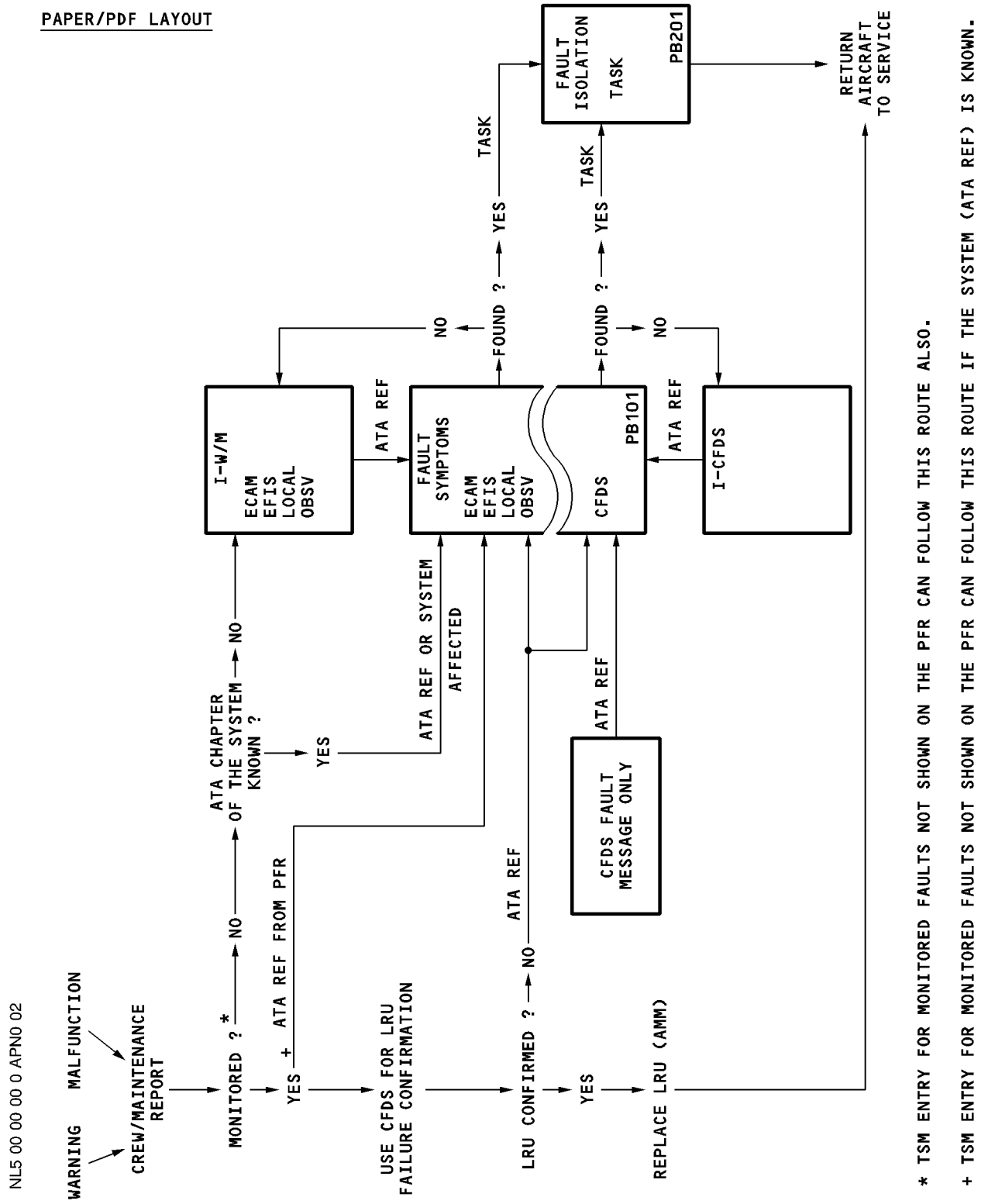
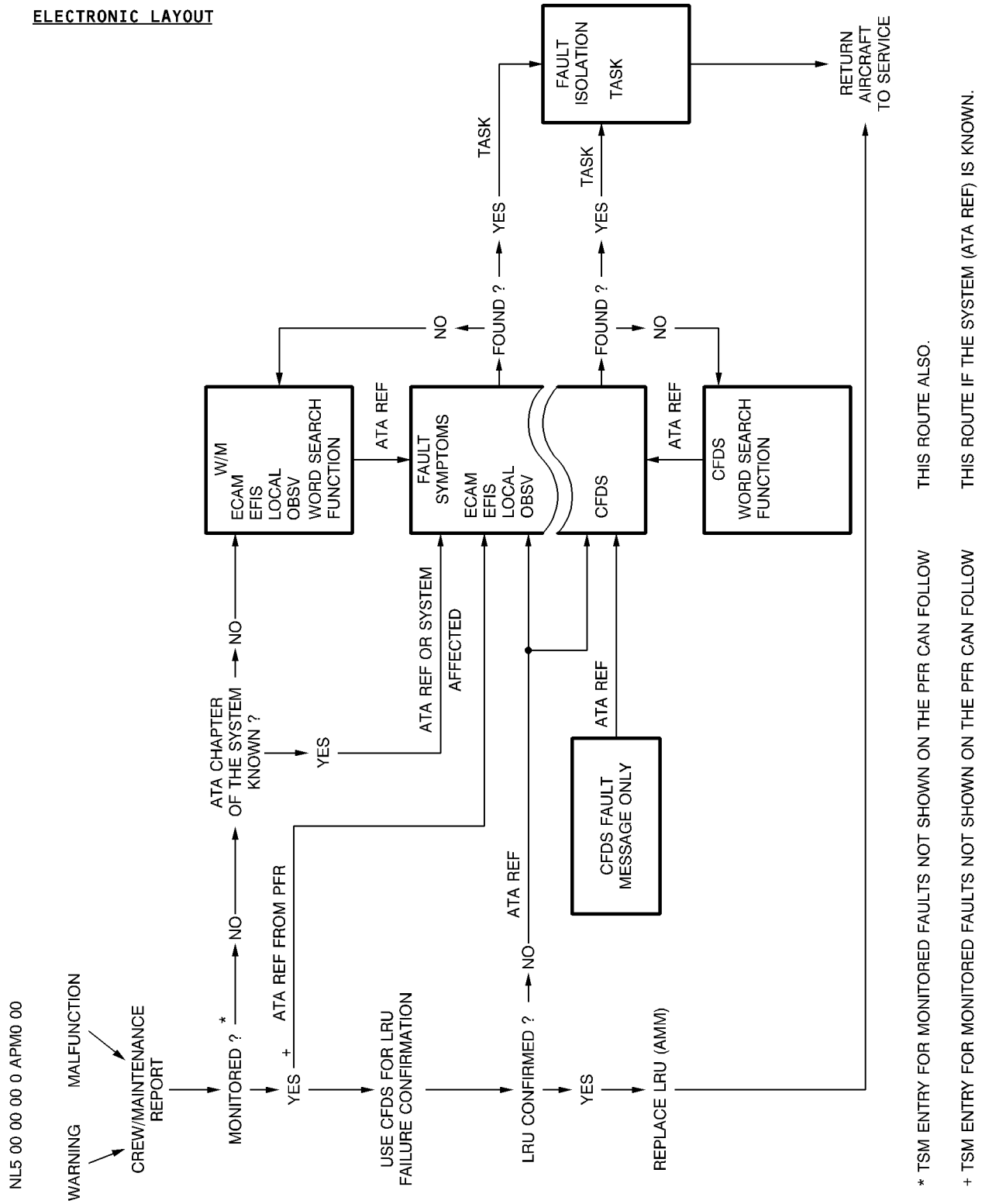
PAPER/PDF LAYOUT



Trouble Shooting Flow
Figure 011 (SHEET 1)

ELECTRONIC LAYOUT



Trouble Shooting Flow
Figure 011 (SHEET 2)

4. How to Use the CFDS

A. Types of systems

Systems have been divided into three categories in order to limit the complexity:
- type 1
- type 2
- type 3

depending on the type of interface that they may have with the CFDIU. This system organization in three types essentially remains transparent for the operator as the CFDIU manages any differences. Nonetheless, their definitions make it possible to understand why certain menus are simplified.

(1) Type 1 systems

These systems are characterized by an input/output interface with the CFDIU of the ARINC 429 bus/ARINC 429 bus type. Most systems are provided with this type of interface.
This type of system enables:
- output: permanent transmission to the CFDIU of maintenance messages generated during the current flight or during the last flight
- input: an operator to dialog on the ground with the BITEs and therefore have access to complementary information (test, ground report, etc.).

(2) Type 2 systems

These systems are characterized by an input/output interface with the CFDIU of the discrete/ARINC 429 bus type.
This type of system enables:
- output: permanent transmission to the CFDIU of maintenance messages generated during the current flight or during the last flight as well as permanent transmission while on the ground of maintenance messages generated on the ground
- input: an operator to launch on the ground the system test and to obtain the results via the output bus.

(3) Type 3 systems

These systems are characterized by an input/output interface with the CFDIU of the discrete/discrete type.
This type of system enables:
- output: permanent transmission of the operating status (OK, not OK)
- input: an operator to launch on the ground the system test and to obtain the result (OK, or not OK) via the discrete output.

The CFDIU codes the corresponding maintenance message in plain language.

B. System BITE

(Ref. Fig. 012)
When a system includes several computers, one of the computers collects the maintenance information and provides the link between the system and the CFDIU. It then realises the BITE function and therefore reports on behalf of all system computers.
This architecture provides for a better targeted diagnosis by correlating data between system computers as well as reducing bus links with the CFDIU.
For the operator, the resulting consequences are minor:
- it is the maintenance message itself which identifies, where necessary, the message source in the system
  example: source = ECAM1; message = SDAC1 : NO DATA FROM BMC1.
  The SDAC which is part of the Flight Warning System has generated the message.

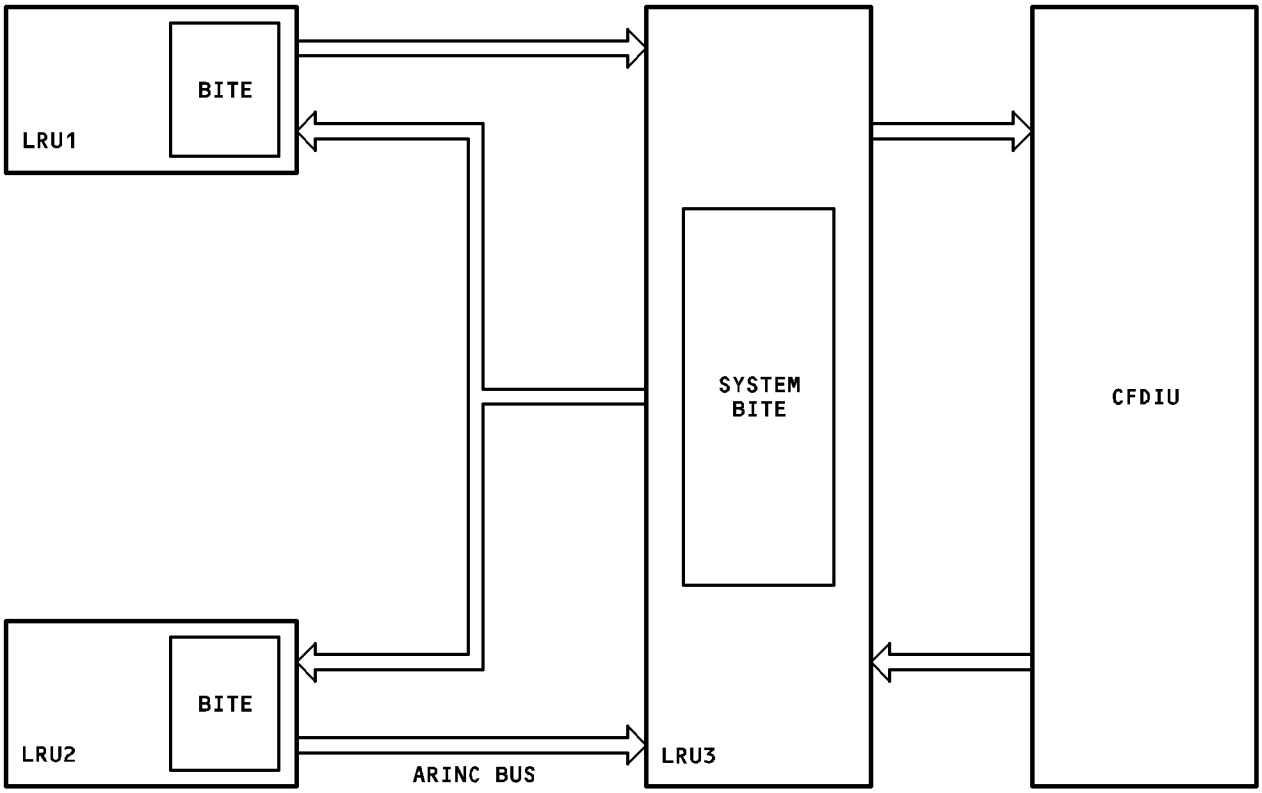
C. Flight/ground conditions

(Ref. Fig. 013)
Information concerning detected faults is generated by the CFDS according to flight/ground conditions.
Faults detected on ground may be due to maintenance actions on the aircraft and therefore are not to be taken into account (e.g. loss of a system because the circuit breaker is open).
This is the reason why the aircraft systems have 2 types of memorization:
- the first one for the faults detected on ground
- the second one for the faults detected in flight.
  The flight/ground condition used by the CFDS is specific and has been selected so as to eliminate the false faults while covering, in the best possible manner, all operations. This is calculated by the CFDIU.

The flight condition is located between first engine start up plus three minutes (or eighty knots plus thirty seconds if flight plan is not available in the FMS) and eighty knots plus thirty seconds after touch down.

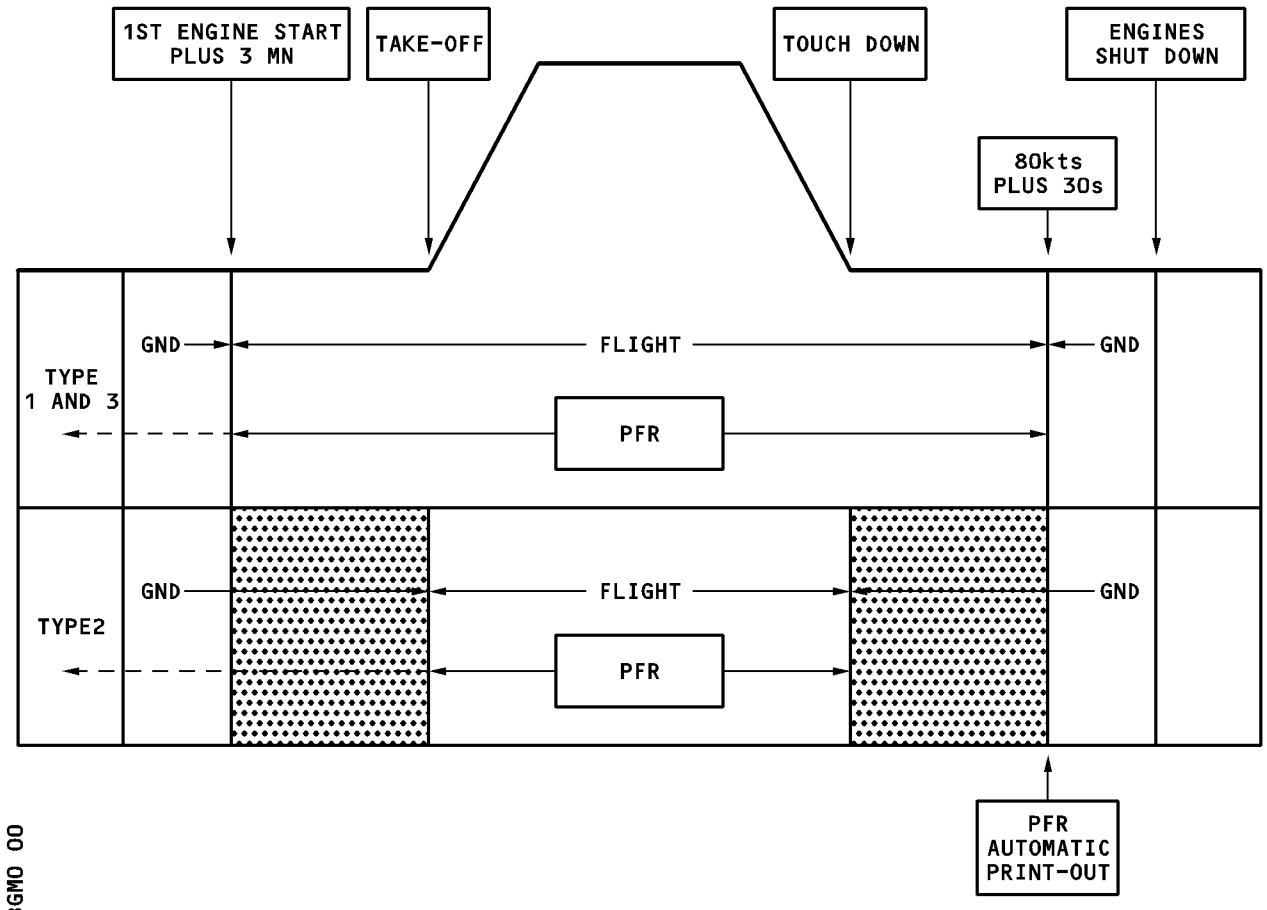
NOTE : In case of engine run up for maintenance purpose, a flight number (at least one character) must be entered using the MCDU to get a PFR, the eighty knots condition being never reached.

Type 1 systems provided with an ARINC bus from the CFDIU will use this flight/ground condition defined by the CFDIU (correct synchronization, monitored range optimized).
Management of messages of type 3 systems (no input or output bus) is via the CFDIU which uses its own flight/ground condition.
Type 2 systems cannot receive this information (no input bus) and generate it by default. For these systems, the flight condition is between takeoff and landing.
This difference only causes minor consequences for maintainability of type 2 systems.
In fact, only:



NL5 00 00 00 0 AEMO 00

System BITE
Figure 012



NL5 00 00 00 0 BGMO 00

Flight/Ground Conditions
Figure 013

- the faults which may be detected between startup of the first engine plus three minutes and takeoff are reported on the PFR facing the CLIMB phase
- the faults which may be detected between touch down and eighty knots plus thirty seconds are not reported on the PFR on the last flight (Ref. Para. 4.E.(1)).

Nonetheless, type 2 systems having no specific function during these phases, the probability of occurrence of these cases is very low.
For the CFDS, a cycle is defined as a set of sequences between two ground/flight transitions as defined by the CFDS.
Conclusion:
Faults detected during flight will generate maintenance messages in the PFR associated with this flight (if class 1 or 2 as defined in Para 4.D.).
Other faults, exceptionally detected on the ground after the flight, may generate maintenance messages in a ground report (Ref. Para. 4.E.(3)(b)) of the associated system. However, if no corrections are made, effective faults will still be present in the next cycle and will consequently generate maintenance messages in the next PFR following the ground/flight transition.
Maintenance messages are stored only once during a given cycle at the first detection after the beginning of the cycle.

D. Maintenance message classification

(1) General

Maintenance message classification is based on fault consequence.
All faults can be divided into three groups:
- the faults leading to an operational event in the cockpit
- the faults leading to an ECAM MAINTENANCE STATUS
- the faults without cockpit events.

NOTE : In each ATA chapter page block 101, the table lists:
- all the possible theorical cases.
  In order to limit the number of cockpit events displayed to the pilots after a single fault, some systems do not generate a cockpit event while they send a class 1 or class 2 fault message because it is already done by another system.
  This means that in most of the cases, the fault message is associated with a cockpit event (ECAM warning, local warning, flag, maintenance status...).
  But in specific cases of fault e.g. only a small part of wiring is faulty and only one of the receivers detects the fault, it is possible to find in the PFR only the fault message.
- fault messages which are only displayed in a test result page.
  Some faults can be detected only during a specific test. The associated fault message is therefore only displayed on the MCDU as a test result and will never appear on a PFR.

- fault messages which need a manual switching in order to generate a cockpit event.
  For systems which are in standby and which fail, the fault message is immediately available in the **PFR** but the associated cockpit event is shown in the cockpit only when a manual switching activates this system (example **ADIRU3**).

(2) Faults with operational cockpit event

This event is also called a cockpit effect. Examples of cockpit effects are: an **ECAM** warning, a local warning, a flag, or any invalid function such as a missing audio signal, amber crosses on a system page, etc.
Some of these faults have consequences on the system safety objective and are **NO GO** items (i.e.: the failure must be fixed before the next departure) or **GO IF** items (**GO** if the conditions given in the **MEL** are fulfilled). The others are **GO** without conditions.
For some of these faults the cockpit effect does not automatically appear to the crew when it is activated (e.g.: amber crosses on a system page).
The status regarding all these faults is given by the **MEL**.
When the crew take notice of a fault through the cockpit effect they must report it into the aircraft **LOG BOOK**.
In order to be able to launch the proper maintenance actions, all faults:
- having a cockpit effect and
- detected by the systems are covered by a **CLASS 1** maintenance message transmitted to the **CFDIU**.
  Class 1 maintenance messages are presented in the Post Flight Report at the end of the flight.

NOTE : Some of the system faults having an effect in the cabin are also covered by a **CLASS 1** maintenance message transmitted to the **CFDIU**.

(3) Faults triggering an **ECAM MAINTENANCE STATUS**

These faults have no consequence on the system operating conditions. They are always **GO** without any restriction. These faults must be fixed at the first opportunity and not later than the "rectification interval" required as per **MMEL** section 01-00.
The crew must make an entry into the **LOG BOOK** (Pilot report) because this information is provided by the **FWS** at the end of the flight, after engines shutdown, through the **ECAM MAINTENANCE STATUS**.
In order to launch at the first opportunity the proper maintenance action it is necessary to provide the information to the maintenance teams. Consequently, these faults are covered by a **CLASS 2** maintenance message transmitted to the **CFDIU**.
Class 2 maintenance messages are presented in the Post Flight Report at the end of the flight.

(4) Faults without cockpit event

(a) General philosophy
These faults have no consequence on the system operating conditions and the crew is not aware of them.
All faults detected by the systems without cockpit event are covered by a CLASS 3 fault maintenance message.
These messages are recorded in each system BITE (class 3 report).

NOTE : For engine system this definition must be completed with the following information.

(b) Engine system
The class 3 faults (without cockpit event) have been classified in the two following categories:
- the TIME LIMITED dispatch faults: which means that the fault may remain uncorrected within a maximum time frame specified by the Maintenance Planning Document.

- the UNLIMITED TIME dispatch faults: which means that the fault may remain uncorrected within an unlimited time frame.

  All these faults are presented by the FADEC BITE in the 'Scheduled Maintenance Report' at the aircraft level and classified "S" in the Trouble Shooting Manual.
  Within class "S" faults, an (*) at the end of the maintenance message will highlight UNLIMITED TIME dispatch faults.
  Faults without the (*) correspond to TIME LIMITED dispatch faults.

  Example:
  'CFDIU,EIU (FLGT), J3*' is an UNLIMITED TIME dispatch fault and should be treated like any other aircraft system CLASS 3 fault.

  'T495L harn (En-4028 KS2)J9/ECU(En-4000Ks)' is a TIME LIMITED dispatch fault and must be corrected in accordance with the Maintenance Planning Document.

(5) Internal fault/external fault

A unique fault may disturb several systems. In this case, it will lead to the generation of several maintenance messages (one per system). One of these messages may be more accurate than the others. Depending on the fault and its effect, it will be the one generated either by a computer which detects itself faulty (self monitoring) or by the computer in charge of the BITE of the system.
Under these conditions this message is qualified by the unit generating it as having priority over all messages transmitted by the other systems for the same fault. It will be the one retained by the CFDIU (refer to the PFR). This message is called internal.
The other maintenance messages related to the same fault are called external by the other systems. They have less accuracy, have not

priority and are not recorded in this case by the CFDIU. Only their origins are memorized by the CFDIU as identifiers (refer to the PFR). Therefore, each system has in memory an information linked to every message transmitted to the CFDIU which defines its internal or external attribute so that the CFDIU can give priority to the most accurate one.
When no priority messages are received by the CFDIU for the same event it is considered that the accuracy is equal for all messages received. In this case the CFDIU retains the first one received.

Remark: as a general rule, the LRUs incriminated by the maintenance messages shown in the PFR are part of the systems which generated the internal messages.

Example:
(Ref. Fig. 014)
A fault of the ADM sensor is detected by the ADIRU.
The ADIRU sends a fault message (e.g. ADIRU1: NO ADM 19FP1 DATA) to the CFDIU and invalidates some parameters on its output buses (e.g. Airspeed). This fault message is coded as internal by the ADIRU.
The users of the ADIRU data (EIS, AFS, ECAM, FADEC, ...) detect the loss of the airspeed parameter. They send fault messages to the CFDIU, coded as external (e.g. EIS1: NO ADIRU1 DATA).
The CFDIU stores the fault message from the ADIRU and the name of the systems which have detected the fault.
The PFR is:

	SOURCE	IDENTIFIERS
ADIRU1 : NO ADM19 FP1 DATA	ADIRU1	EIS, AFS, ECAM FADEC

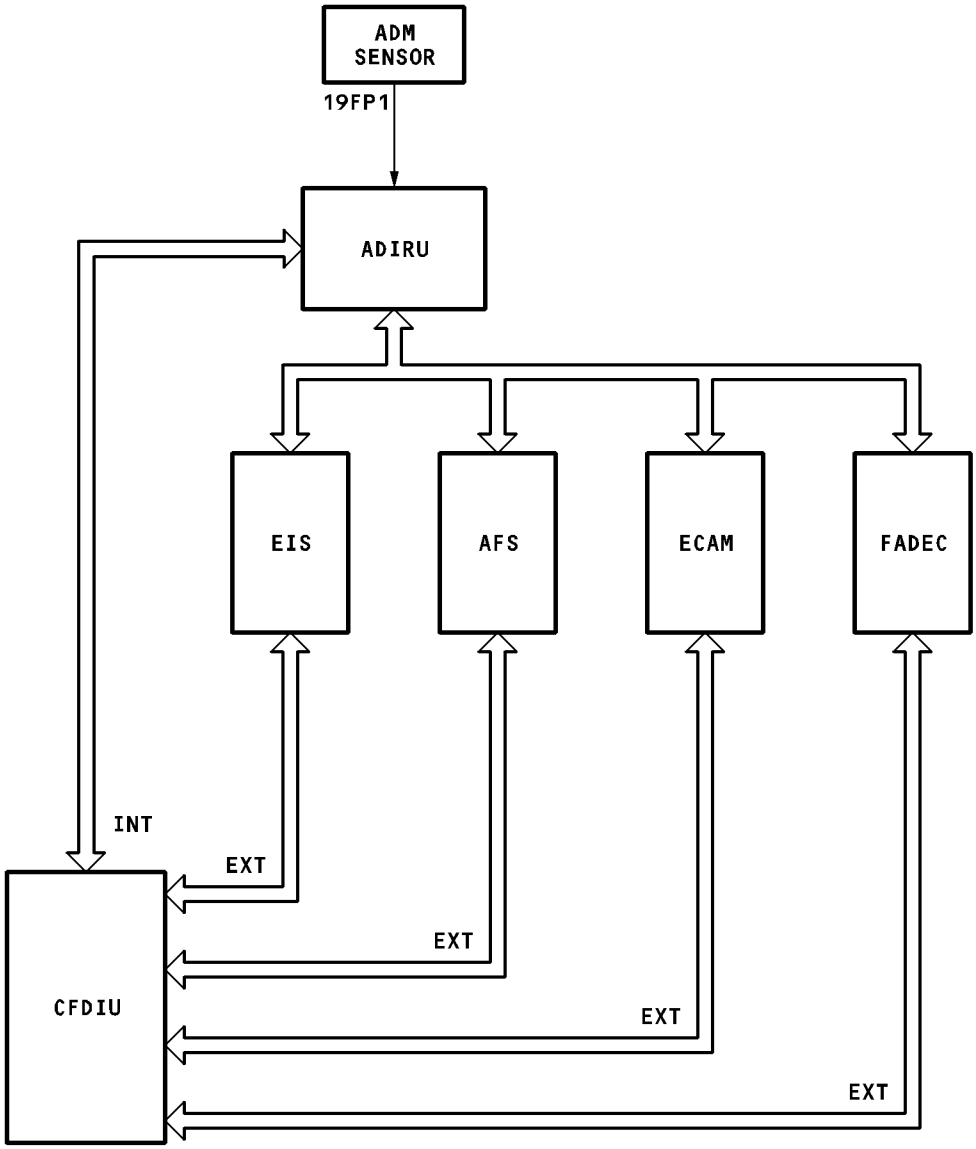
E. Maintenance functions

(1) First group: the PFR

(a) Description of the PFR

R A maintenance report on the last flight is automatically printed
R after touch down, 2 minutes and 30 seconds after the aircraft
R speed decreases below 80 kts.
This document is the Post Flight Report (PFR). The PFR is a result of the CFDS automatic operating mode.
This report is the main source of information used to initiate trouble shooting and to decide on the required maintenance actions.

(Ref. Fig. 015)
A backup of the printed PFR is available on the MCDU. It should only be used if the printed PFR is not available as the information is less complete and the presentation is not so friendly.
Conditional maintenance operations are carried out in response to the observations made by the flight crew in the LOG BOOK.



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Example of ADM Sensor Fault Detection
Figure 014

A/C ID DATE GMT FLTN CITY PAIR
D-AIPA 29JAN 2304 974 GCTS EDDF

MAINTENANCE
POST FLIGHT REPORT

DB/N

A/C ID DATE GMT FLTN CITY PAIR
D-AIPA 29JAN 1507/1935 LH4747 GCTS EDDF

ECAM WARNING MESSAGES

GMT	PH	ATA	
1511	04	77-00	ENG 2 FADEC
1527	06	27-00	NAV ADR 3 FAULT(5)
1528	06	27-00	F/CTL

FAILURE MESSAGES

GMT	PH	ATA		SOURCE	IDENTIFIERS
1511	04	73-22-52	FMU/HC/EEC2	EIU2FADEC	
1527	06	34-11-17	ADM19FP8	ADR 3	EFCS 1/AFS EFCS 2
1528	06	27-94-34	SEC2 OR WIRING FROM ACCLRM3 12CE3	EFCS1	EFCS2
1744	06	32-41-13	CHECK TIRES 1/2 PRESS 2649/2650GM	TPIS	
1744	06	32-49-18	TIRE 1 ROTATING MECH 7GV OR PRESS TRANSDUCER 13GV	TPIS	

NL5 00 00 00 0 ALM0 01

POST FLIGHT REPORT
Figure 015

EFF : ALL

R

SROS

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This information represents a cockpit effect as previously defined.

The following data are recorded in the PFR:

- **ECAM WARNING MESSAGES**
  The **ECAM WARNING MESSAGES** contains:
- the warning message available on the upper **ECAM** display unit
- the Maintenance Status.
  These warning messages are associated with their **ATA** reference (aid for cross referencing with the maintenance message).
- **FAULTS:**
  Maintenance messages are listed in the **PFR** in the **FAILURE MESSAGES** part.
  Additional information is associated with each message.
- **FLIGHT PHASE - GMT**
  Flight operational phases (**CLIMB, CRUISE,** etc.) are indicated in coded form in the **PFR** in front of the warning message. The time (**GMT**) is also given in front of the warning message and the maintenance message.
  . **FLIGHT PHASE** decoding:
  02 : Engine start + 3 mn up to **TO** Power
  03 : **TO** Power up to 80 kts
  04 : 80 kts up to lift off
  05 : Climb
  06 : Cruise
  07 : Descent
  08 : Touch down up to 80 kts
  09 : 80 kts up to last engine shut down.
- **ATA:**
  This is the **ATA** chapter of the first suspected component. It is the entry point to the technical documentation. It may also be an aid in relation to the corresponding warning message and with the **GMT**.
- **SOURCE:**
  The source is the system (for system **BITE**) or the computer which generated the maintenance message retained by the **CFDIU** for this event and recorded in the **PFR**.
- **IDENTIFIER(S):**
  The identifier(s) are the computers which have also reacted in relation to the fault by generating:
  . external maintenance messages not retained by the **CFDIU**
  . cockpit effects.

(b) Correlation principle

1 Correlation between fault messages:
In order to limit the number of fault messages printed on the **PFR** and to give the line mechanic only the root cause of a fault, the **CFDIU** correlates the fault messages.
This correlation is based on the **GMT** and the **ATA** chapter of the received fault messages.

2 Correlation between fault message and ECAM warning or Maintenance Status:
This correlation has to be performed by the line mechanic. The ATA Chapter and the GMT have to be used (general case).
If a fault appears and disappears several times during the same flight leg, the corresponding fault message is transmitted only at the first detection, but the ECAM warning (for a Class 1 fault) or the Maintenance Status (for a Class 2 fault) is displayed every time in the cockpit and transmitted every time to the CFDIU.
Therefore, it is possible to find in the PFR several times the same ECAM warning or Maintenance Status but only one fault message.

Example:

ECAM WARNING MESSAGES

GMT	PH	ATA	
1000	06	31-00	DAR(3)
1030	06	21-31	CAB PR SYS 2 FAULT
1045	06	31-00	DAR

FAILURE MESSAGES

GMT	PH	ATA		SOURCE	IDENT.
1000	06	31-36-52	DAR	DMU	
1030	06	21-31-34	PRESS CONTR 2	CPC2	

The DAR fails several times during the flight.
The figure (3) displayed after the Maintenance Status "DAR" means that this Maintenance Status was sent 3 consecutive times to the CFDIU for PFR recording. In order to prevent the recording of 3 "DAR" messages, the "occurence counter" has been activated, and only the fault message related to the first occurrence of the DAR fault is recorded (GMT = 1000).
But as a warning "CAB PR SYS 2 FAULT" has been recorded (GMT = 1030), followed by a new "DAR" Maintenance Status (GMT=1045), then in this case the "occurence counter" is reset.
If the warning "CAB PR SYS 2 FAULT" would have not been recorded, the "DAR" message would have been recorded at GMT=1000 with a counter set to 4.

(c) An ECAM warning or a Maintenance Status can be associated with a system only shown as an identifier in the PFR, because it is not the root cause of the fault.

Example:

```
ECAM WARNING MESSAGES
GMT     PH      ATA
0844    06      34-00       NAV RA 2 FAULT
0844    06      27-00       F/CTL

FAILURE MESSAGES
GMT     PH      ATA                                 SOURCE    IDENT.
0844    06      34-42-33    NO RA2 DATA             CFDS      EFCS 1
                                                              EFCS 2
                                                              ECAM 1
                                                              ECAM 2
                                                              EIS 1
                                                              EIS 2
```

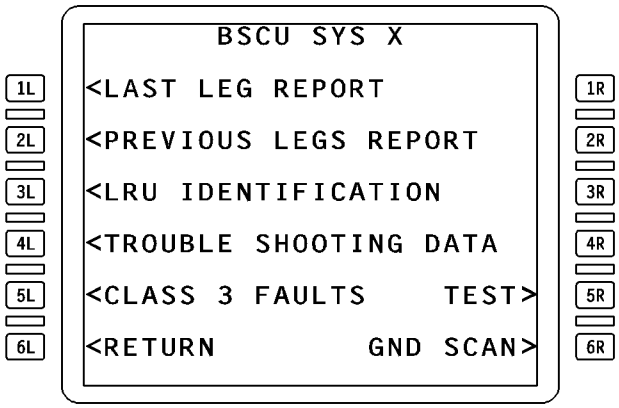
There is a Radio Altimeter 2 fault.
The RA2 is really faulty and is not able to send a fault message.
The users of the RA2 signals detect the fault (CFDS, EFCS, ECAM, EIS). For the EFCS, the loss of the RA2 is a class 2 fault. The associated Maintenance Status is available (F/CTL).
The installation of a new RA2 on the aircraft will eliminate the ECAM warning and the Maintenance Status.

NOTE : The number of identifiers is limited to 6. If more than 6 are correlated, the CFDIU keeps only the first six systems received. The remaining are ignored. It is therefore theorically possible to have an ECAM warning or a Maintenance Status without any indication on the associated system in the FAILURE MESSAGES part.

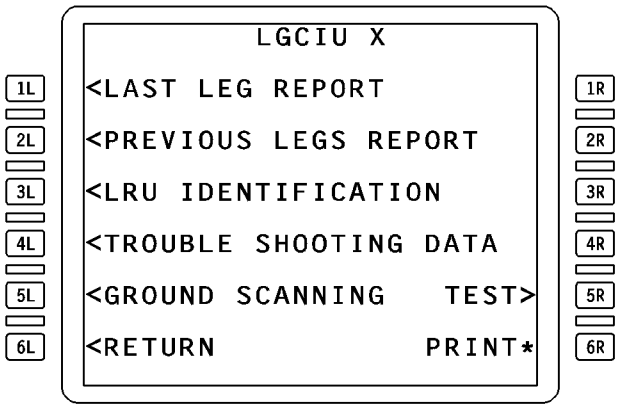
(2) 2nd group: reports available via the SYSTEM REPORT/TEST

The manual test function is the main function of the CFDS manual operating mode.
The purpose is to be able to test on the ground, the maximum number of components, i.e. the integrity of the computer managing the test, the system LRUs and the validity of the external signals used by the system with a single test.

(a) Various types of tests
(Ref. Fig. 016)
Nonetheless, in order to optimize the test function and better satisfy operator requirements, certain adaptations have been introduced:
- To limit system complexity and their BITE, the test function does not always fully cover complete system integrity.
  In the TSM with each maintenance message, the test or the procedure will be indicated making it possible to recheck the component on the ground
- To better manage the effect of the test on the system and its ground handling the test function may be divided into two groups:



BSCU



LGCIU

NL5 00 00 00 0 AQM0 00

Examples of Main Menu
Figure 016

. BASIC TEST (OR SYSTEM TEST)
. COMPLEMENTARY TESTS.

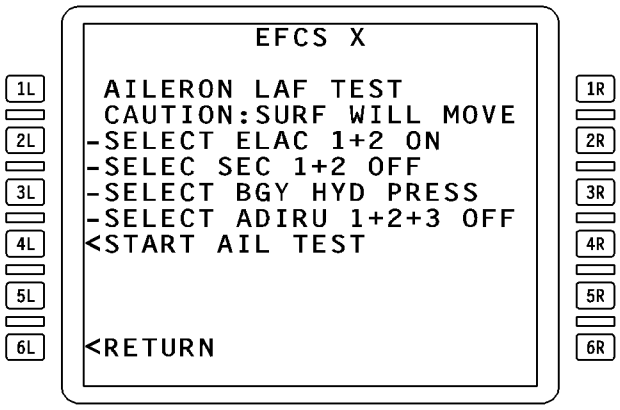
This makes it possible to have at least one test available at the terminal gate (the basic test) which is quickly to start-up by a single technician, the other tests making it possible to increase the global coverage level of the tests where useful and possible.
All these tests are run on the ground from the **MCDU** using, first of all, the **CFDIU** menu **(SYSTEM REPORT/TEST)** then the system **MENU.**

***** Basic test or system test
This test has no effect on the aircraft and does not require that any long or complex actions be performed by the operator. Consequently, this test may be initiated from the cockpit by a single operator whenever required during stopovers.
All faults present on ground and actually detected by the system will be analyzed and reported by this test. Furthermore, it must be run before any other test to check the integrity of the computer housing the **BITE.**

***** Complementary tests
(Ref. Fig. 017)
These tests may affect the aircraft (and may require actions by the operator). In fact these tests send stimuli to various components such as actuators, valves, etc.
For this reason, **CAUTIONS** may be displayed on the **MCDU** before activation of test.
The wording of the cautions is in fact simply a reminder of the consequences on the aircraft following test activation. In fact, the safety procedures associated with these tests are in the **AMM.**
Consequently, normally these tests are not performed during a short stopover. Test names are related to the tested parts.

These tests can also be menu-guided tests. The actions to be taken are displayed in plain language on the **MCDU.** (Description of the initial configuration, description of the actions, wording of the questions to which the operator must respond). Test names are related to the tested parts.

(b) Presentation of the test pages
- Certain information may require several pages. Each page is then numbered and the **MCDU NEXT PAGE** function key is used to run through the test
- In certain cases, the system waits until the operator has performed an action to continue the test. Then there is a limited time out so as not to stop in this configuration when the monitored signals are blocked. This implies that the operator action must be performed before this time out.



NL5 00 00 00 0 ASMO 00

Example of Caution
Figure 017

- A dash may be shown when data is not available. This does not necessarily mean that an effective failure is present. Only maintenance messages indicate possible failures.

(c) Initial aircraft configuration for test activation
The general configuration of the aircraft for test activation is basically as follows:
- aircraft on ground
- engines stopped
- all systems power supplied (**ADIRS, FADEC** may be off)
- pushbutton switches and switches in normal configuration.

If a test calls for a different configuration, this configuration will be described in the **AMM**.
To limit **BITE** complexity all these conditions are assumed to be correctly applied by the operator. Consequently, if a difference is detected by a system it is considered as a fault and therefore generates a maintenance message in the test results.
In all cases, it is recommended to restart the tests indicating faults in the results to eliminate any possible disturbances or wrong initial conditions.

(d) **TEST IN PROGRESS**
When a test is run without any operator action being requested the **TEST IN PROGRESS** can be displayed on the **MCDU**.

(e) Test results
The result of a test is one of the following:
- The mention **TEST OK, PASS, NO FAULT, ...**:
  The test has not detected any faults
- The display of maintenance messages on the **MCDU**:
  The test has detected at least one fault.
  In certain multiple fault cases, the test may only indicate the first fault encountered. In fact, certain faults prevent to run the test more extensively.
  Test re-running after repair of the fault is therefore always necessary to check whether there is another fault or not. Only the mention **TEST OK, PASS, NO FAULT ...** is proof that the test has not detected any other faults.
- No response from the system to the test request or no results displayed:
  In this case, the test has not been completed.

  Return to initial condition is obtained by pressing the **MCDU MENU** key then **CFDS** key and selecting the system again.
  If the same sequence reoccurs then the computer managing the **BITE** of the system or the wiring from the **CFDIU** must be the cause.

(f) Test stop
In some cases, a key is allocated to stop a test in progress.

(g) Configuration resetting after a test
The operator may be requested to reconfigure after a test if the initial conditions required by the test have had a significant effect on the aircraft (instructions are in the **AMM**). If the operator wants to repeat the test he is not obliged to apply these instructions on configuration resetting.

(h) Ground handling of the tests
As maintenance messages are stored in the **PFR** or the **GROUND REPORT** they will not be erased until the next beginning of flight. Therefore, a test is a means of checking whether a fault is still present and a means of isolating a failed **LRU**.
Activation of a test will be requested in the **TSM** by the fault isolation procedure related to a maintenance message. It will be used to confirm the presence of a fault or to eliminate any ambiguity. As a general rule, the test of the system including the **LRU** incriminated by the maintenance message (message **ATA**) will be activated. By default, the test of the system which generated the message (**SOURCE**) may be activated.
The activation of a test may also be part of the removal/installation procedure of an **LRU** given in the **AMM**.

(3) 3rd group

(a) **AVIONICS STATUS**
This function displays the identity of the systems detecting a class 1, 2 or 3 internal or external fault when the function is called.
The **AVIONICS STATUS** thus rapidly provides a global overview of the status of all systems. It is a user-friendly monitoring device providing direct access to system menus which detect a fault (for example, flag displayed on the **PFD**).
Furthermore, after aircraft power up, it enables to check that all computers have correctly satisfied the related power up tests.
In order to know the reason for which a system is displayed in the **AVIONICS STATUS** it is recommended to get access to the system menu and to activate the system test (or test).

NOTE : Certain systems are listed in the **AVIONICS STATUS** due to normal absence of a ground power supply. Therefore, it is recommended to supply all systems prior to gaining access to the **AVIONICS STATUS**.
It shall be noted that when a computer is not supplied it is not directly displayed in the **AVIONICS STATUS** as it no longer detects, itself, this fault. However, the systems using the signals from this computer appear in the **AVIONICS STATUS**.

(b) GROUND REPORT

This function displays on ground the class 1, 2 and 3 internal maintenance messages related to new faults detected on ground and which are therefore not recorded in the PFR. The faults detected during flight and which remain present on ground are in the PFR and not in the ground report.

It is necessary to confirm all faults of the ground report by activating a test or a procedure described in the TSM.

NOTE : Case related to Type 2 systems:
This function is in the LAST LEG/GROUND REPORT section specific to type 2 systems.
The messages in this section concern faults detected during flight and on ground, the wording GND preceding the list of messages related to the faults detected on the ground in accordance with the same ground report logic as for type 1 systems.
Case related to Type 3 systems:
There is no ground report function for Type 3 systems. The test function shall be used in this case.

(c) GROUND SCANNING

The GROUND SCANNING enables fault trouble shooting based on ground activation by the operator himself of functions normally performed during a flight.

The advantage of this is that it is not restrictive as far as actions are concerned. In fact, the operator decides what type of actions to be performed on the system, which is in GROUND SCANNING, as a function of the problems to be processed.

This action may include dynamic phases (for example: engine startup, flight control surface movement, etc.).

This is also an aid in trouble shooting faults difficult to resolve.

All maintenance messages (class 1, 2 and 3, internal and external) related to all faults detected in real time by the system will be displayed during the GROUND SCANNING.

In order to indicate a transient fault source to the operator, the maintenance messages, automatically displayed in GROUND SCANNING, are only erased when exiting from the function.

Furthermore, GROUND SCANNING must always be preceded by a system test in order to identify, sooner, the possible static faults.

The use of this function may also be requested by the TSM procedures.

(d) LAST LEG REPORT

This section presents a portion of the information given in the PFR.

It contains the class 1 and 2 fault messages transmitted to the CFDIU during the previous flight.

NOTE : For information purposes, the messages generated by the identifiers are accessible in the last leg report of these

identifiers. The user who wants to use these messages must do so carefully as the information involved is non-correlated and non-priority information.

(4) 4th group

(a) **PREVIOUS LEGS REPORT**
The **PREVIOUS LEGS REPORT** function is the history of the **LAST LEG REPORT** limited to 64 flights. Therefore, it is displayed with the same restrictions.

(b) **TROUBLE SHOOTING DATA**
In most cases, this concerns primary and coded data.
The purpose is to supply additional information on conditions prevailing when the maintenance message was generated.
In general, these data are read in the case of events which do not result from effective part failure, already covered by the replacement of the failed part.
Analysis of this data will be effectively useful in the study which may enable the identification of the cause of an event.

NOTE : In certain cases, this analysis can only be concluded with the designer.

If certain trouble shooting data are required for fault trouble shooting, data readout will be requested by a **TSM** procedure. Wherever possible, these data will be displayed decoded on the **MCDU**.

(c) **LRU IDENTIFICATION**
The purpose of this section is to display on ground the part numbers of computers of the selected system and possibly their serial numbers. This section may be consulted to check the interrogated computer standard.
This is a configuration management aid.

(5) 5th group

(a) **CLASS 3 REPORT**
All class 3 (internal and external) maintenance messages corresponding to the selected system are grouped under this report. This function enables a quick access to the class 3 messages of a given system.

NOTE : Some systems do not have class 3 reports.

(6) Summary of the functions

Summary of the functions available in ground menu mode (Manual Mode).

	HISTORY DATA	REAL TIME
CFDIU driven	- POST FLIGHT REPORT	- AVIONICS STATUS (at activation)
SYSTEM driven	- LAST LEG REPORT - PREVIOUS LEGS REPORT - GROUND REPORT - CLASS 3 REPORT - TROUBLE SHOOTING DATA	- TEST (all) - GROUND SCANNING - LRU IDENTIFICATION

5. Glossary of Abbreviations

ABBREVATION	SIGNIFICATION
A	Amber
A	Alternate
A/C	Aircraft
A/D	Analog/Digital
A/DC	Analog-to-Digital Converter
A/R	Audio Reproducer
A/SKID	Anti-Skid
A/THR	Autothrust
A/XFMR	Autotransformer
ABCU	Alternate Braking Control Unit
AC	Alternating Current
ACARS	Aircraft Communication Addressing and Reporting System
ACC	Active Clearance Control
ACCEL	Acceleration/Accelerate
ACCLRM	Accelerometer
ACCU	ACCUMULATOR
ACMM	Abbreviated Component Maintenance Manual
ACMS	Aircraft Condition Monitoring System
ACP	Area Call Panel
ACP	Audio Control Panel
ACQN	Acquisition
ACSC	Air Conditioning System Controller
ACT	Active

ABBREVATION	SIGNIFICATION
ACTR	Actuator
ADC	Air Data Computer
ADF	Automatic Direction Finder
ADIRS	Air Data/Inertial Reference System
ADIRU	Air Data/Inertial Reference Unit
ADM	Air Data Module
ADR	Air Data Reference
ADS	Air Data System
ADV	Advisory
AEVC	Avionics Equipment Ventilation Computer
AF	Audio Frequency
AFS	Automatic Flight System
AGB	Accessory Gearbox
AGC	Automatic Gain Control
AGL	Above Ground Level
AGW	Actual Gross Weight
AIL	Aileron
AIM	Aircraft Integrated Maintenance
AIP	Attendant Indication Panel
ALIGN	ALIGNMENT
ALT	Altitude
ALTM	Altimeter
ALTN	Alternate, Alternative
AM	Amplitude Modulation
AMM	Aircraft Maintenance Manual

ABBREVATION	SIGNIFICATION
AMU	Audio Management Unit
ANI	Analog Input
ANN	Annunciator
ANN LT	Annunciator Light
ANO	Analog Output
ANT	Antenna
AOA	Angle-of-Attack
AP	Autopilot
AP/FD	Autopilot/Flight Director
APPR	Approach
APPU	Asymmetry Position Pick Off Unit
APU	Auxiliary Power Unit
ARINC	Aeronautical Radio Incorporated
ARPT	Airport
ASCII	American Standard Code for Information Interchange
ASI	Airspeed Indicator
ASIC	Application Specific Integrated Circuits
ASM	Aircraft Schematics Manual
ASP	Audio Selector Panel
ASSY	Assembly
ATA	Air Transport Association of America
ATC	Air Traffic Control
ATE	Automatic Test Equipment
ATLAS	Abbreviated Test Language for All Systems
ATS	Autothrottle System

ABBREVATION	SIGNIFICATION
ATSU	Air Traffic Service Unit
ATT	Attitude
ATTND	Attendant
AUTO	Automatic
AUX	Auxiliary
AVAIL	Available
AVNCS	Avionics
AWM	Aircraft Wiring Manual
AWY	Airway
AZ	Azimuth
B	Blue
BARO	Barometric
BAT	Battery
BCD	Binary Coded Decimal
BCL	Battery Charge Limiter
BFO	Beat Frequency Oscillator
BGM	Boarding Music
BITE	Built-in Test Equipment
BMC	Bleed Monitoring Computer
BNR	BINARY
BOT	Begin of Tape
BP	Bottom Plug
BRG	Bearing
BRK	Brake
BRKR	Breaker

ABBREVATION	SIGNIFICATION
BRKT	Bracket
BRT	Bright, Brightness
BSCU	Braking/Steering Control Unit
BTC	Bus Tie Contactor
BTMU	Brake Temperature Monitoring Unit
BTN	Button
BTR	Bus Tie Relay
BU	Battery Unit
BUS	Busbar
BYDU	Back-Up Yaw Damper Unit
C	Close
C	Celsius, Centigrade
C/B	Circuit Breaker
C/L	Check List
CAB	Cabin
CAM	Cabin Assignment Module
CAPT	Captain
CAS	Calibrated Air Speed
CAUT	Caution
CAUT LT	Caution Light
CBMS	Circuit Breaker Monitoring System
CBMU	Circuit Breaker Monitoring Unit
CCS	Cabin Communications System
CCW	Counter Clockwise
CDP	Compressor Discharge Pressure

ABBREVATION	SIGNIFICATION
CDU	Control and Display Unit
CFDIU	Centralized Fault Display Interface Unit
CFDS	Centralized Fault Display System
CFMI	CFM International
CFRP	Carbon Fiber Reinforced Plastic
CG	Center of Gravity
CGCS	Center of Gravity Control System
CHAN	Channel
CHG	Change
CIDS	Cabin Intercommunication Data System
CK	Check
CKPT	Cockpit
CKT	Circuit
CL	Center Line
CLB	Climb
CLG	Centerline Landing Gear
CLOG	Clogging
CLR	Clear
CMC	Central Maintenance Computer
CMD	Command
CMM	Component Maintenance Manual
CMS	Central Maintenance System
CNTOR	Contactor
CO	Company
COM	Communication

ABBREVATION	SIGNIFICATION
COMPT	Compartment
COMPTR	Comparator
COND	Conditioned, Conditioning
CONFIG	Configuration
CONT	Controller
CONV	Converter
COOL	Cooling, Cooler
COS	Cosine
CPC	Cabin Pressure Controller
CPLR	Coupler
CPMS	Cabin and Passenger Management System
CPMU	Cabin Passenger Management Unit
CPRSR	Compressor
CPU	Central Processing Unit
CRC	Continuous Repetitive Chime
CRG	Cargo
CRS	Course
CRT	Cathode Ray Tube
CRZ	Cruise
CSD	Constant Speed Drive
CSM/G	Constant Speed Motor/Generator
CSTR	Constraint
CSU	Command Sensor Unit
CT	Current Transformer
CTL	Central

ABBREVATION	SIGNIFICATION
CTL	Control
CTR	Center
CU	Control Unit
CUDU	Current Unbalance Detection Unit
CUR	Current
CVR	Cockpit Voice Recorder
CVT	Center Vent Tube
CW	Clockwise
D/D	Engine Out Drift Down Point
D/O	Description and Operation
DA	Drift Angle
DAC	Digital to Analog Converter
DAR	Digital ACMS Recorder
DC	Direct Current
DDRMI	Digital Distance and Radio Magnetic Indicator
DEC	Declination
DECEL	Decelerate
DECR	Decrease
DEF	Definition
DELTA P	Differential Pressure
DES	Descent
DEST	Destination
DET	Detection, Detector
DEU	Decoder/Encoder Unit
DEV	Deviation

ABBREVATION	SIGNIFICATION
DFDR	Digital Flight Data Recorder
DFDRS	Digital Flight Data Recording System
DGI	Digital Input
DGO	Digital Output
DH	Decision Height
DIA	Diameter
DIFF	Differential
DIM	Dimming, Dimension
DIR	Direction, Direct, Director
DISC	Disconnect, Disconnected
DIST	Distance
DMA	Direct Memory Access
DMC	Display Management Computer
DME	Distance Measuring Equipment
DMU	Data Management Unit
DN	Down
DNLK	Downlock
DPDT	Double Pole/Double Throw
DPI	Differential Pressure Indicator
DR	Dead Reckoning
DRVR	Driver
DSCRT	Discrete
DSDL	Dedicated Serial Data Link
DSI	Discrete Input
DSO	Discrete Output

ABBREVATION	SIGNIFICATION
DSPL	Display
DTG	Distance to Go
DTMF	Dual Tone Multiple Frequency
DU	Display Unit
E	East
ECAM	Electronic Centralized Aircraft Monitoring
ECB	Electronic Control Box (APU)
ECM	Engine Condition Monitoring
ECMU	Electrical Contactor Management Unit
ECON	Economy
ECP	Ecam Control Panel
ECS	Environmental Control System
ECU	Electronic Control Unit
EEC	Electronic Engine Control
EEPROM	Electrically Eraseable Programmable Read Only Memory
EFCS	Electrical Flight Control System
EFF	Effective, Effectivity
EFIS	Electronic Flight Instrument System
EGIU	Electrical Generation Interface Unit
EGT	Exhaust Gas Temperature
EIS	Electronic Instrument System
EIU	Engine Interface Unit
EIVMU	Engine Interface and Vibration Monitoring Unit
ELEC	Electric, Electrical, Electricity
ELEV	Elevation, Elevator

ABBREVATION	SIGNIFICATION
EMER	Emergency
EMI	Electromagnetic Interference
END	Endurance
ENG	Engine
EO	Engine Out
EOSID	Engine Out Standard Instrument Departure
EOT	End of Tape
EPC	External Power Contactor
EPGS	Electrical Power Generation System
EPR	Engine Pressure Ratio
EPROM	Erasable Programmable Read Only Memory
EPSU	Emergency Power Supply Unit
EQPT	Equipment
ESS	Essential
EST	Estimated
ETA	Estimated Time of Arrival
ETE	Estimated Time en Route
ETP	Equal Time Point
EVAC	Evacuation
EWD	Engine/Warning Display
EXC	Excitation, Excite
EXCESS	Excessive
EXT	Exterior, External
F	Fahrenheit
F-PLN	Flight Plan

ABBREVATION	SIGNIFICATION
F/O	First Officer
FAC	Flight Augmentation Computer
FADEC	Full Authority Digital Engine Control
FAIL	Failed, Failure
FAP	Forward Attendant Panel
FC	Fully Closed
FCDC	Flight Control Data Concentrator
FCMS	Fuel Control Monitoring System
FCOM	Flight Crew Operating Manual
FCPC	Flight Control Primary Computer
FCSC	Flight Control Secondary Computer
FCTN	Function
FCU	Flight Control Unit
FCV	Flow Control Valve
FD	Flight Director
FDBK	Feedback
FDIU	Flight Data Interface Unit
FDU	Fire Detection Unit
FE	Flight Envelope
FF	Fuel Flow
FG	Flight Guidance
FIDS	Fault Isolation and Detection System
FIFO	First Input/First Output
FIG	Figure
FIN	Functional Item Number

ABBREVATION	SIGNIFICATION
FL	Flight Level
FLEX	Flexible
FLP	Flap
FLT	Flight
FM	Flight Management
FMA	Flight Mode Annunciator
FMC	Flight Management Computer
FMGC	Flight Management and Guidance Computer
FMGS	Flight Management and Guidance System
FMGS	Flight Management and Guidance System
FMS	Flight Management System
FMV	Fuel Metering Valve
FO	Fully Open
FOB	Fuel On Board
FPA	Flight Path Angle
FPEEPMS	Floor Proximity Emergency Escape Path Marking System
FPPU	Feedback Position Pick-off Unit
FPV	Flight Path Vector
FQ	Fuel Quantity
FQI	Fuel Quantity Indicating/Indication/Indicator
FR	Frame
FREQ	Frequency
FRU	Frequency Reference Unit
FRV	Fuel Return Valve
FSB	Fasten Seat Belts

ABBREVATION	SIGNIFICATION
FW	Failure Warning
FWC	Flight Warning Computer
FWD	Forward
FWS	Flight Warning System
G	Green
G/S	Glide Slope
GA	Go-Around
GALY	
GAPCU	Ground Auxiliary Power Control Unit
	Galley
GCR	Generator Control Relay
GCU	Generator Control Unit
GEN	Generator
GLC	Generator Line Contactor
GLR	Generator Line Relay
GMT	Greenwich Mean Time
GND	Ground
GPCU	Ground Power Control Unit
GPS	Global Positioning System
GPU	Ground Power Unit
GPWC	Ground Proximity Warning Computer
GPWS	Ground Proximity Warning System
GRP	Geographic Reference Point
GRU	Ground Refrigeration Unit
GS	Ground Speed

ABBREVATION	SIGNIFICATION
GSE	Ground Support Equipment
GW	Gross Weight
H	Hot (Electrical Point)
HCU	Hydraulic Control Unit
HDG	Heading
HEGS	Hydraulic Electrical Generating System
HF	High Frequency
HI	High
HLAC	High Level Alternating Current Voltage
HLDC	High Level Direct Current Voltage
HMU	Hydromechanical Unit
HP	High Pressure
HPC	High Pressure Compressor
HPT	High Pressure Turbine
HPTACC	High Pressure Turbine Active Clearance Control
HS	High Speed
HSI	Horizontal Situation Indicator
HSMU	Hydraulic System Monitoring Unit
HUDC	Head Up Display Computer
HYD	Hydraulic
I/O	Input/Output
I/P	Intercept Profile
I/P	Input
IAE	International Aero Engines
IAS	Indicated Airspeed

ABBREVATION	SIGNIFICATION
IDENT	Identification, Identifier, Identify
IDG	Integrated Drive Generator
IGB	Inlet Gear Box
IGN	Ignition
IGV	Inlet Guide Vane
ILS	Instrument Landing System (LOC and G/S)
IMM	Immediate
INB	Inbound
INBD	Inboard
INCR	Increment
IND	Indicator
INFO	Information
INHIB	Inhibition, Inhibit, Inhibited
INIT	Initial(ization)
INOP	Inoperative
INR	Inner
INT	Interrupt
INTCP	Intercept
INTFC	Interface
INTL	Internal
INTRG	Interrogate, Interrogator
INV	Inverter
IP	Intermediate Pressure
IPC	Illustrated Parts Catalog
IPPU	Instrumentation Position Pick-off Unit

ABBREVATION	SIGNIFICATION
IR	Inertial Reference
IRS	Inertial Reference System
ISA	International Standard Atmosphere
ISO	International Standardization Organisation
ISOL	Isolation
IVS	Inertial Vertical Speed
JAM	Jammed, Jamming
JAR	Joint Airworthiness Requirements
L	Left
L	Length
L/G	Landing Gear
LA	Linear Accelerometer
LAT	Lateral
LAT	Latitude
LAV	Lavatory
LBP	Left Bottom Plug
LCD	Liquid Crystal Display
LCIT	Load Compressor Inlet Temperature
LDG	Landing
LE	Leading Edge
LED	Light Emitting Diode
LGCIU	Landing Gear Control and Interface Unit
LIM	Limit, Limitation, Limiting, Limiter
LKD	Locked
LL	Lat/Long

ABBREVATION	SIGNIFICATION
LLDC	Low Level Direct Current Voltage
LMP	Left Middle Plug
LNG	Long
LMS	Leakage Measurement System
LO	Low
LOC	Localizer
LONG	Longitude
LONGN	Longeron
LOP	Low Oil Pressure
LP	Low Pressure
LPT	Low Pressure Turbine
LPTACC	Low Pressure Turbine Active Clearance Control
LRU	Line Replaceable Unit
LS	Loudspeaker
LSB	Least Significant Bit
LSI	Large Scale Integration
LT	Light
LTP	Left Top Plug
LV	Low Voltage
LVDT	Linear Variable Differential Transducer
LVL	Level
LW	Landing Weight
LWR	Lower
MAC	Mean Aerodynamic Chord
MAG	Magnetic

ABBREVATION	SIGNIFICATION
MAINT	Maintenance
MAN	Manual
MAX	Maximum
MCDU	Multipurpose Control & Display Unit
MCL	Maximum Climb
MCT	Maximum Continuous Thrust
MCU	Modular Concept Unit
MDA	Minimum Descent Altitude
MDDU	Multipurpose Disk Drive Unit
MECH	Mechanic, Mechanical, Mechanism
MED	Medium
MES	Main Engine Start
MI	Magnetic Indicator
MIC	Microphone
MICBAC	Micro-System Bus Access Channel
MID	Middle
MIN	Minimum
MISC	Miscellaneous
MKR	Marker (radio) Beacon
MLA	Maneuver Load Alleviation
MLG	Main Landing Gear
MLI	Magnetic Level Indicator
MLS	Microwave Landing System
MLW	Maximum Design Landing Weight
MMEL	Master Minimum Equipment List

ABBREVATION	SIGNIFICATION
MMO	Maximum Operating Mach
MMR	Multi Mode Receiver
MODLTR	Modulator
MON	Monitor, Monitored
MONG	Monitoring
MORA	Minimum Off Route Altitude
MOT	Motor, Motorized
MPD	Maintenance Planning Document
MSA	Minimum Safe Altitude
MSB	Most Significant Bit
MSG	Message
MSL	Mean Sea Level
MSU	Mode Selector Unit (IRS)
MSW	Microswitch
MTBF	Mean Time Between Failure
MTBUR	Mean Time Between Unscheduled Removals
MTG	Mounting
MTO	Maximum Take-Off
MTOGW	Maximum Takeoff Gross Weight
MU	Management Unit
MUX	Multiplex, Multiplexer
MVT	Movement
MZFW	Maximum Design Zero Fuel Weight
N	Normal, North
N/A	Not Applicable

ABBREVATION	SIGNIFICATION
N/P	Next Page
N/W	Nose Wheel
N/WS	Nose Wheel Steering
NAC	Nacelle
NAS	Navy and Army Standard
NAV	Navigation
NAVAID	Navigation Aid
NBPT	No Break Power Transfer
NC	Normally Closed
NCD	No Computed Data
ND	Navigation Display
NDB	Non-Directional Beacon
NEG	Negative
NLG	Nose Landing Gear
NMI	Non Maskable Interrupt
No	Number
NO	Normally Open
NO	Normal Operation in SSM
NORM	Normal
NS	No Smoking
NUM	Numerical
NVM	Non-Volatile Memory
N1	Low Pressure Rotor Speed
N2	High Pressure Rotor Speed
O	Open

	ABBREVATION	SIGNIFICATION
	O/P	Output
	OAT	Outside Air Temperature
	OBRM	On Board Replaceable Module
	OC	Open Circuit
	OC	Overcurrent
	OF	Overfrequency
	OFST	Offset
R	OFV	Outflow Valve
	OGV	Outlet Guide Vane
	OHU	Optical Head Unit
	OIT	Oil Inlet Temperature
	OK	Correct
	OMS	Onboard Maintenance System
	OOT	Oil Outlet Temperature
	OP	Operational
	OPP	Opposite
	OPS	Operation
	OPT	Optimum
	OPV	Overpressure Valve
	OUTBD	Outboard
	OVBD	Overboard
	OVHD	Overhead
	OVHT	Overheat
	OVLD	Overload
	OVRD	Override

ABBREVATION	SIGNIFICATION
OVSP	Overspeed
OXY	Oxygen
P/B	Pushbutton
P/BSW	Pushbutton Switch
PA	Passenger Address
PATS	Passenger Air-to-Ground Telephone System
PAX	Passenger
PC	Pack Controller
PCB	Printed Circuit Board
PCM	Pulse Code Modulation
PCU	Passenger Control Unit
PCU	Power Control Unit
PED	Pedestal
PERF	Performance
PES	Passenger Entertainment (System)
PF	Power Factor
PFD	Primary Flight Display
PH	Phase
PHC	Probe Heat Computer
PIU	Passenger Information Unit
PMA	Permanent Magnet Alternator
PMG	Permanent Magnet Generator
PN	Part Number
PNL	Panel
POB	Pressure-Off Brake

ABBREVATION	SIGNIFICATION
POR	Point of Regulation
POS	Position
POT	Potentiometer
PPOS	Present Position
PR	Power Ready Relay
PRAM	Prerecorded Announcement and Music
PREAMP	Preamplifier
PRED	Prediction
PRESEL	Preselector/Preselection
PRESS	Pressure, Pressurization, Pressurize
PREV	Previous
PRIM	Primary
PROC T	Procedure Turn
PROF	Profile
PROG	Progress
PROM	Programmable Read Only Memory
PROT	Protection
PROX	Proximity
PRR	Power Ready Relay
PSCU	Proximity Switch Control Unit
PSDU	Power Supply Decoupling Unit
PSI	Pound per Square Inch
PSS	Passenger Services System
PSU	Passenger Service Unit
PT	Point

ABBREVATION	SIGNIFICATION
PTC	Positive Temperature Coefficient
PTT	Push to Test
PTT	Push-to-Talk
PU	Panel Unit
PVI	Paravisual Indicating
PVIS	Passenger Visual Information System
PWR	Power
Q	Pitch Rate
QAD	Quick-Attach-Detach
QAR	Quick Access Recorder
QAT	Quadruple ARINC Transmitter
QEC	Quick Engine Change
QFE	Field Elevation Atmospheric Pressure
QFU	Runway Heading
QNE	Sea Level Standard Atmosphere Pressure
QNH	Sea Level Atmospheric Pressure
QTY	Quantity
R	Red
R	Right
R/I	Radio/Inertial
RA	Radio Altimeter, Radio Altitude
RAC	Rotor Active Clearance
RACC	Rotor Active Clearance Control
RACSB	Rotor Active Clearance Start Bleed
RAD	Radio

	ABBREVATION	SIGNIFICATION
	RAM	Random Access Memory
	RAT	Ram Air Turbine
	RBP	Right Bottom Plug
	RC	Repetitive Chime
	RCC	Remote Charge Converter
	RCCB	Remote Control Circuit Breaker
	RCDR	Recorder
	RCL	Recall
	RCPT	Receptacle
	RCPTN	Reception
	RCVR	Receiver
	RECIRC	Recirculate, Recirculation
	RECT	Rectifier
	RED	Reduction
	REF	Reference
	REFUEL	Refueling
	REG	Regulator
R	REGUL	Regulation
	REL	Release
	RES	Resistance
	RET	Return
	REV	Reverse
	REV	Revise, Revision
	RF	Radio Frequency
	RLA	Reverser Lever Angle

	ABBREVATION	SIGNIFICATION
	RLS	Remote Light Sensor
	RLY	Relay
	RMP	Radio Management Panel
	RNG	Range
	ROM	Read Only Memory
R	RPCU	Residual Pressure Control Unit
	RPLNT	Repellent
	RPM	Revolution per Minute
	RQRD	Required
	RST	Reset
	RSV	Reserve
	RSVR	Reservoir
	RTE	Route
	RTN	Return
	RTP	Right Top Plug
	RTS	Return to Seat
	RUD	Rudder
	RVDT	Rotary Variable Differential Transducer
	RVR	Runway Visual Range
	RWY	Runway
	S	South
	S/C	Step Climb
	S/D	Step Descent
	SAF	Safety
	SAT	Static Air Temperature

ABBREVATION	SIGNIFICATION
SC	Single Chime
SD	System Display
SDAC	System Data Acquisition Concentrator
SDCU	Smoke Detection Control Unit
SDN	System Description Note
SEB	Seat Electronic Box
SEC	Secondary
SEL	Select, Selected, Selector, Selection
SELCAL	Selective Calling System
SFCC	Slat Flap Control Computer
SH ABS	Shock Absorber
SHED	Shedding
SHT	Short
SIC	System Isolation Contactor
SID	Standard Instrument Departure
SIG	Signal
SLT	Slat
SMK	Smoke
SN	Serial Number
SOL	Solenoid
SOV	Shut-Off Valve
SPD	Speed
SPLY	Supply
SQ	Squelch
SRU	Shop Replaceable Unit

ABBREVATION	SIGNIFICATION
SSB	Single Side Band
SSEC	Static Source Error Correction
SSM	Sign Status Matrix
SSTU	Side Stick Transducer Unit
STA	Station
STAB	Stabilizer
STAR	Standard Terminal Arrival Route
STAT	Static
STBY	Standby
STD	Standard
STGR	Stringer
STS	Status
SVCE	Service
SW	Switch
SWTG	Switching
SYNTHR	Synthetizer
SYS	System
T	True, Turn
T/C	Top of Climb
T/D	Top of Descent
T/R	Thrust Reverser
T-P	Turn Point
TACT	Tactical
TAS	True Airspeed
TAT	Total Air Temperature

ABBREVATION	SIGNIFICATION
TBC	To Be Confirmed
TBD	To be Determined
TCAS	Traffic Alert and Collision Avoidance System
T2CAS	Traffic and Terrain Collision Avoidance System
TCC	Turbine Case Cooling
TDS	Technical Data Sheet
TE	Trailing Edge
TEC	Turbine Exhaust Case
TEMP	Temperature
TFU	Technical Follow-Up
TGT	Target
THR	Thrust
THRM	Thermal
THS	Trimmable Horizontal Stabilizer
TIT	Turbine Inlet Temperature
TK	Tank
TKE	Track Angle Error
TLA	Throttle Lever Angle
TLU	Travel Limitation Unit
TMR	Timer
TO	Takeoff
TOGW	Takeoff Gross Weight
TOT	Total
TPIC	Tire Pressure Indicating Computer
TPIS	Tire Pressure Indicating System

ABBREVATION	SIGNIFICATION
TR	Transformer Rectifier
TRA	Throttle Resolver Angle
TRANS	Transition
TRDV	Thrust Reverser Directional Valve
TRF	Turbine Rear Frame
TRIG	Trigger
TRK	Track (angle)
TROPO	Tropopause
TRPV	Thrust Reverser Pressurizing Valve
TRV	Travel
TSM	Trouble Shooting Manual
TTG	Time to Go
TTL	Transistor Transistor Logic
TTS	Trim Tank System
TURB	Turbulent, Turbulence
UF	Underfrequency
UHF	Ultra High Frequency
UNLK	Unlock
UNLKD	Unlocked, Unlocking
UNSD	UNUSED
UPR	Upper
UTC	Universal Time Coordinated
UV	Under Voltage
V/S	Vertical Speed
Vc	Calibrated Airspeed

ABBREVATION	SIGNIFICATION
VAC	Voltage Alternating Current
VAR	Variable, Variation
VBV	Variable Bleed Valve
VC	Ventilation Controller
VCO	Voltage Controlled Oscillator
VCU	Video Control Unit
VDC	Voltage Direct Current
VDEV	Vertical Deviation
VEL	Velocity
VENT	Ventilation
VERT	Vertical
VFE	Maximum Flat Extended Speed
VFTO	Final Takeoff Speed
VHF	Very High Frequency
VHV	Very High Voltage
VIB	Vibration
VLE	Maximum Landing Gear Extended Speed
VLO	Maximum Landing Gear Operating Speed
VLS	Lower Selectable Speed
VM	Voltmeter
VMAX	Maximum Allowable Airspeed
VMO	Maximum Operating Speed
VOR	VHF Omnidirectional Range
VOR.D	VOR-DME
VR	Rotation Speed

ABBREVATION	SIGNIFICATION
VRMS	Volt Root Mean Square
VRS	V2500 Repair Scheme
VSC	Vacuum System Controller
VSCF	Variable Speed Constant Frequency
VSV	Variable Stator Vane
VSWR	Voltage Standing Wave Ratio
V1	Critical Engine Failure Speed
V2	Takeoff Safety Speed
V3	Flap Retraction Speed
V4	Slat Retraction Speed
W	Weight
W	White
WARN	Warning
WBC	Weight & Balance Computer
WBS	Weight and Balance System
WD	Warning Display
WHC	Window Heat Computer
WHL	Wheel
WIPCU	Water Ice Protection Control Unit
WIPDU	Water Ice Protection Data Unit
WPT	Waypoint
WTB	Wing Tip Brake
WXR	Weather Radar
X FEED	Crossfeed
X-TALK	Cross-Talk

ABBREVATION	SIGNIFICATION
XCVR	Transceiver
XDCR	Transducer
XFMR	Transformer
XFR	Transfer
XMSN	Transmission
XMTR	Transmitter
XPDR	Transponder
Y	Yellow
Z	Zone
ZFCG	Zero Fuel Center of Gravity
ZFW	Zero Fuel Weight
3D	Three Dimensional (Lat, Long, Alt)
4D	Four Dimensional (Lat, Long, Alt, Time)