FLIGHT CREW OPERATING MANUAL

A318/A319/A320/A321

FMGS

PILOT'S GUIDE

4

AIRBUS®

00.00 CONTENTS

00.10 ORGANIZATION OF THE MANUAL
– FOREWORD 1
– COMMENTS – QUESTIONS – SUGGESTIONS 1
– CONTENT 1
– USE 2
– PAGINATION 3
– REVISIONS 4
– HOW TO INSERT A REVISION 5
– BEST WAY TO GET UPDATED DOCUMENTATION 5

00.20 LIST OF CODES

00.30 LIST OF NORMAL REVISIONS

00.35 RECORD OF TEMPORARY REVISIONS

R **00.36 LIST OF EFFECTIVE TEMPORARY REVISIONS**

00.70 CROSS REFERENCE TABLE

00.75 HIGHLIGHTS

00.80 LIST OF EFFECTIVE PAGES

00.85 LIST OF MODIFICATIONS

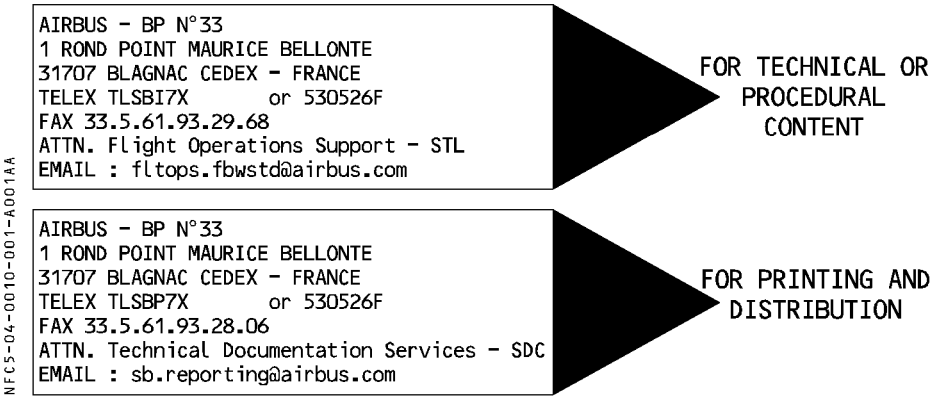
FOREWORD

This manual complements the approved Flight Manual. Airbus has attempted to ensure that the data contained in this manual agrees with the data in the Flight Manual. If there is any disagreement, the Flight Manual is the final authority.

COMMENTS — QUESTIONS — SUGGESTIONS

All manual holders and users are encouraged to submit any Flight Crew Operating Manual questions and suggestions to :

R



CONTENT

R The Flight Crew Operating Manual (FCOM), and the associated Quick Reference Handbook
R (QRH), are developed specifically for flight crews, in order to provide them with all of the
R necessary information about the operational, technical, procedural, and performance
R characteristics that are required for the safe and efficient aircraft operation. These manuals
R take into account all of the operational procedures to be applied during normal and
R abnormal/emergency situations that may occur on ground or in flight.
R The manuals are not designed to provide basic airmanship skills or piloting techniques.
R They are intended for flight crews that have already been trained to fly this type of aircraft,
R and are familiar with the aircraft's handling characteristics.
R In addition, the purpose of the FCOM is to :
R — Be used as a comprehensive reference guide during initial and refresher flight crew
R training. Practical and training-related information is addressed in the Flight Crew
R Training Manual (FCTM).
R — Provide Airbus operators with a basis for their development of a customized airline
R operations manual, in accordance with applicable requirements.

Vol 1 = Systems' description (description of the aircraft systems).
Vol 2 = Flight preparation (performance information, plus loading data).
Vol 3 = Flight operations (operating procedures, techniques, and performance information).
Vol 4 = FMGS pilot's guide (procedures for FMGS use).

USE

As a comprehensive set of references, the FCOM :
- can be used by an operator's flight operations department to supplement its own crew manual
- can be issued directly to crew members for training and subsequently for line operations.

WARNINGS, CAUTIONS AND NOTES

WARNING : an operating procedure, technique, etc, which may result in personel injury or loss of life if not carefully followed.
CAUTION : an operating procedure, technique, etc, which may result in damage to equipment if not carefully followed.
NOTE : an operating procedure, technique, etc, considered essential to emphasize.

COMPLEMENTARY INFORMATION

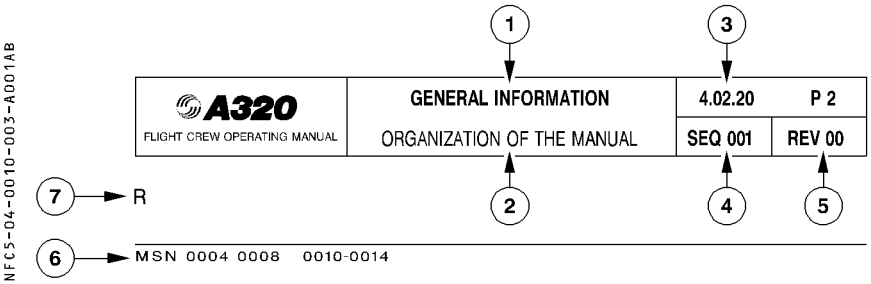
The manual includes technical information required for training as well as complementary information.
- Where a paragraph or schematic is preceded by the heading **FOR INFO** the details given are considered to be "nice to know". Knowledge of these items is not required for the type rating qualification.
- ECAM warnings and cautions are summarized in a table at the end of each chapter of volume 1. Numeric values are given for information only.

OPTIONAL EQUIPMENT

The legend "◁" indicates that a paragraph or a shematic is applicable only if the related equipment is installed.

PAGINATION

R



(1) Chapter title

(2) Subchapter title

(3) FCOM volume number, Chapter number, Section number, Page number

(4) Sequence number is used for Airbus Industrie management of different aircraft configurations and allows to enter into list of effective pages

(5) Revision number of the manual at which the page has been revised

(6) Aircraft MSN

R – 0004 0008 means that the page is applicable to aircraft MSN 004 and MSN 008

R – 0010-0014 means that the page is applicable to aircraft MSN 010 to MSN 0014

– ALL means that the page is applicable to all aircraft covered by the manual.

Correspondance between MSN and registration may be found in the cross reference table

(7) An “R” in front of a line indicates that the line has been revised.

REVISIONS

NORMAL REVISIONS

There are issued periodically to cover non-urgent corrections and changes, and to add new data.
They are accompanied by filing instructions and an updated List of Effective Pages that includes customized pages.
A normal revision record sheet is at the front of each volume.
In addition, each volume has a "List of MOD/MP affecting the manual", that gives a simple explanation of the technical content of each MOD/MP incorporated and its validity per aircraft.

R INTERMEDIATE REVISIONS

R They are issued between normal revisions to cover changes in the definition of the aircraft
R or changes in the composition of the fleet of an airline. They are numbered in ascending
R sequence e.g. 20A, 20B, 20C... for intermediate revisions issued between normal revisions
R 20 and 21.
R They are accompanied by filing instructions and an updated list of effective pages.

TEMPORARY REVISIONS

Printed on yellow paper these are, issued to cover urgent matters arising between normal revisions. They are accompanied by filing instructions and an updated customized list of effective TR.
A yellow temporary revision record sheet is at the front of each volume. It is to be filled by the FCOM's owner.

INCORPORATION OF SERVICE BULLETINS IN THE MANUAL

When a Service Bulletin (SB) has been accomplished on one or more aircraft of the operator fleet, and notified to Airbus Industrie, all affected manuals will reflect the new
R aircraft configuration at next revision. If judged necessary by Airbus Industrie, or requested by the operator, a "Temporary Revision" or an intermediate revision is issued between normal revisions.

OPERATIONS ENGINEERING BULLETINS

These are issued as the need arises to give operators revised or new, but significant, technical and procedural information.
OEBs come with an OEB record sheet. This record sheet is re-issued with each normal revision to update the bulletin embodiment status.
R They are accompanied by filing instructions and an updated customized list of effective OEB.

HOW TO INSERT A REVISION

FILING INSTRUCTIONS

Use the filing instructions as follows :

- REMOVE : The page must be removed. It may be replaced by a new page if associated with an "INSERT" instruction. If not, the page is cancelled.
- INSERT : The page must be inserted. If not associated with a "REMOVE" instruction, the page is new for the operator fleet and does not replace an existing one.

R The column "NOTE" indicates "EFFECTIVITY CHANGE ONLY" if the page is revised due
R to an effectivity change and not due to technical content.

LIST OF EFFECTIVE PAGES (LEP)

The manual after revision must comply with the LEP, which lists all the pages that are in the manual. The new pages are indicated by "N" and the revised pages by "R".

BEST WAY TO GET UPDATED DOCUMENTATION

As soon as any change has been completed on any airplane, the best way to get update documentation is to advise :

AIRBUS INDUSTRIE
BP 33
31707 BLAGNAC CEDEX
FRANCE
Telex : TLSBP7X.. or 530526F
R FAX 33.5.61.93.28.06
ATTN : Customer Service Directorate – Technical Documentation Services (AI/SE – D)
as soon as any change has been completed on any airplane.

To simplify automatic LEP processing some modifications have been grouped under a common code.

CODE	DESIGNATION
0012	Mod : 24035 = 24160 = 24211 = (24035+25863+28551) = (24160+25863+28551) = (24211+25863+28551)
0016	Mod : (24035+24064) = (24035+24065) = (24035+24066) = (24035+24067) = (24064+24211) = (24065+24211) = (24067+24160) = (24067+24211)
0031	Mod : 24414 = (24035+24414) = (24211+24414)
0033	Mod : 25345 = 25346 = (23742+25345) = (23742+25346)
0034	Mod : (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809)
0035	Mod : 31896=31897=31379=31380=32475=32929 = (31896+32332+32475) = (31897+32333+32929)
0048	Mod : 25381 = (25381+31897+32401) = (25381+31896+32332) = (25381+31896+32401)
0049	Mod : 26111 = (26999+28218) = (28382+28218) = (30241+28218) = (30631+28218) = (30635+28218) = (28495+28218)
0050	Mod : 25205 = (28495+26001) = (26999+26001) = (28382+26001) = (30241+26001) = (30631+26001) = (30635+26001)
0051	Mod : 27620 = (27620+32332) = (27620+32333)
0052	Mod : 31896 = 31897 = 32401 = 32402 = 32475
0053	Mod : (27620+31896) = (27620+31897) = (27620+32401) = (27620+32402) = (27620+32475)
0054	Mod : 24105 = (24105+31364+31906) = (24105+31365+31905) = (24105+32332+31905) = (24105+32333+31906)
0055	STD = Mod : (31896+32332) = (31897+32333)
0056	Mod : 26968 = 27831 = 28283 = 28711 = 31364 = 31365 = (31896+32332) = (31897+32333)
0057	Mod : (24035+31896) = (24035+31897) = (24035+32929) = (24035+32475) = (24160+31896) = (24160+31897) = (24160+32475) = (24160+32929) = (24211+31896) = (24211+31897) = (24211+32475) = (24211+32929) = (24035+31896+32332+32475) = (24160+31896+32332+32475) = (24211+31896+32332+32475) = (24035+31897+32333+32929) = (24160+31897+32333+32929) = (24211+31897+32333+32929)
0058	Mod : 24035 = 24160 = 24211 = (24035+31896+32332) = (24035+31897+32333) = (24160+31896+32332) = (24160+31897+32333) = (24211+31896+32332) = (24211+31897+32333)
0059	Mod : 24035 = 24160 = 24211 = (24035+32475) = (24160+32475) = (24211+32475) = (24035+31896+32332) = (24035+31896+32402) = (24035+31897+32333) = (24035+31897+32401) = (24160+31896+32332) = (24160+31896+32402) = (24160+31897+32333) = (24160+31897+32401) = (24211+31896+32332) = (24211+31896+32402) = (24211+31897+32333) = (24211+31897+32401)
0060	Mod : 28238 = 30748 = (28238+31896+32332) = (28238+31897+32333) = (30748+31896+32332) = (30748+31897+32333)
0061	Mod : 28238 = (28238+31896+32332) = (28238+31897+32333)
0062	Mod : 31896 = 31897 = (24035+31896) = (24035+31897) = (24160+31896) = (24160+31897) = (24211+31896) = (24211+31897) = (24035+31896+32332+35119) = (24160+31896+32332+35119) = (24211+31896+32332+35119)
0063	Mod : (28238+31896) = (28238+31897) = (28238+32475) = (28238+32929) = (30748+31896) = (30748+31897) = (30748+32475) = (30748+32929) = (28238+31896+32332+32475) = (28238+31897+32333+32929) = (30748+31896+32332+32475) = (30748+31897+32333+32929)
0065	Mod : 31896 = 31897 = 32475 = 32929 = (31896+32332+32475) = (31897+32333+32929)

CODE	DESIGNATION
0066	Mod : 32475 = 32401 = 32402 = (31896+32402) = (31897+32401) = (23353+32475) = (31896+32332+32475) = (23353+28498+32475) = (23353+31896+32402) = (23353+31897+32401) = (23353+31896+32332+32475) = (23353+28498+31986+32332+32475)
0072	Mod : 28378 = (28378+31896+32332) = (28378+31897+32333)
0074	Mod : 23353 = (23353+31896+32332) = (23353+31897+32333)
0077	Mod : (28238+31896) = (28238+31897) = (28238+32475) = (28238+32929) = (28238+31896+32332+32475) = (28238+31897+32333+32929)
0078	Mod : (28378+31896) = (28378+31897) = (28378+32475) = (28378+32929) = (28378+31896+32332+32475) = (28378+31897+32333+32929)
0081	Mod : (27531+31896) = (27531+31897) = (27531+32475) = (27531+32929) = (27531+31896+32332+32475) = (27531+31897+32333+32929)
0082	Mod : 25295 = 27522 = (25295+27522) = (25295+27522+28360) = (25295+31896+32332) = (25295+31897+32333) = (27522+31896+32332) = (27522+31897+32333) = (25595+27522+31896+32322) = (25595+27522+31897+32323)
0083	STD = Mod : (25295+28499) = (27522+28360) = (31896+32332) = (31897+32333) = (25295+27522+28360+28499)
0084	Mod : 27531 = (27531+31896+32332) = (27531+31897+32333)
0087	STD = Mod : 32475 = 32929 = (31896+32402) = (31897+32333) = (31897+32401)
0096	Mod : 26968 = 27831 = 28283 = 28711 = (31896+32332) = (31897+32333) = (24309+26968+28497) = (24309+27831+28497) = (24309+28283+28497) = (24309+28497+28711) = (24309+28497+31896+32332) = (24309+28497+31897+32333)
0097	STD = Mod : (24309+28497) = (24309+28497+31896+32332) = (24309+28497+31897+32333)
0098	STD = Mod : 24309 = (24309+31896+32332) = (24309+31897+32333)
0099	STD = Mod : 23353 = (23353+31896+32332) = (23353+31897+32333)
0100	STD = Mod : (26999+27917) = (26999+28495)
0101	Mod : 25205 = 26111 = 26485 = 26999 = 28382 = 30241 = 30631 = 30635 = (25205+26999+28495) = (26999+28382+28495) = (26999+31896+32332) = (26999+31897+32333) = (26999+28382+28495+31896+32332) = (26999+28382+28495+31897+32333)
0102	Mod : 23885 = 24075 = 25205 = 26111 = 26485 = 26999 = 28382 = 30241 = 30631 = 30635 = (25205+31896+32332) = (25205+31897+32333) = (26111+31896+32332) = (26111+31897+32333) = (26485+31896+32332) = (26485+31897+32333) = (26999+28382+28495) = (26999+31896+32332) = (26999+31897+32333) = (28382+31896+32332) = (28382+31897+32333) = (30241+31896+32332) = (30241+31897+32333) = (30631+31896+32332) = (30631+31897+32333) = (30635+31896+32332) = (30635+31897+32333) = (23885+24075+26999+28495) = (26999+28382+28495+31896+32332) = (26999+28382+28495+31897+32333)
0104	Mod : (25381+31897) = (25381+31896) = (25381+31897+32401+35651)
0108	Mod : 22013 = 24105 = 25225 = (22013+31896+32332) = (22013+31897+32333) = (24105+31896+32332) = (24105+31897+32333) = (25225+31896+32332) = (25225+31897+32333)
0109	Mod : 24309 = (24309+31896+32332) = (24309+31897+32333)
0110	Mod : (26968+26999+28238) = (26999+27831+28238) = (26999+28238+32332) = (26999+28238+32333) = (26968+26999+28238+31896+32332) = (26999+27831+28238+31897+32333)
0111	Mod : 32401 = 32402 = 32475 = 32929 = 34809 = 34313 = (31896+32402) = (31897+32401) = (31896+32332+32475) = (31897+32333+32929)
0113	STD = Mod : (23353+28498) = (23353+28498+31896+32332) = (23353+28498+31897+32333)

CODE	DESIGNATION
0114	Mod : 34313 = 34809 = (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809)
0117	Mod : 31896 = 31897 = (26999+28495+31896) = (26999+28495+31897) = (31896+32332+35119)
0118	Mod : 31475 = 32929 = (31896+32402) = (31897+32401) = (26999+28495+32475) = (26999+28495+32929) = (31896+32332+32475) = (31897+32333+32929) = (26999+28495+31896+32402) = (26999+28495+31897+32401)
0121	Mod : (24309+31896) = (24309+31897) = (24309+32475) = (24309+32929) = (24309+28497+31896) = (24309+28497+31897) = (24309+28497+32475) = (24039+28497+32929) = ((24309+31896+32332+32475) = (24309+28497+31897+32333+32929) = (24309+28497+31896+32332+32475)
0124	Mod : (26999+31896) = (26999+31897) = (26999+32475) = (26999+32929) = (28382+31897) = (26999+28382+28495+31896) = (26999+28382+28495+31897) = (26999+28382+28495+32475) = (26999+28382+28495+32929) = (26999+31896+32332+32475) = (26999+31897+32333+32929) = (28382+31896+32332+32475) = (28382+31897+32333+32929) = (25205+26999+28495+32475) = (25205+26999+28495+32929) = (26999+28382+28495+31896+32332+32475) = (26999+28382+28495+31897+32333+32929)
0128	Mod : (25295+25381+31896) = (25295+25381+31897) = (25295+25381+32475) = (25295+25381+32929) = (25295+25381+27522+31896) = (25295+25381+27522+31897) = (25295+25381+27522+32475) = (25295+25381+27522+32929) = (25295+25381+27522+28360+31896) = (25295+25381+27522+28360+31897) = (25295+25381+27522+28360+32475) = (25295+25381+27522+28360+32929) = (25295+25381+31896+32332+32475) = (25295+25382+31897+32333+32929) = (25295+25381+27522+31896+32332+32475) = (25295+25381+27522+31897+32333+32929) = (25295+25381+27522+28360+31896+32332+32475) = (25295+25381+27522+28360+31897+32333+32929)
0129	Mod : (22013+31896) = (22013+31897) = (22013+32475) = (22013+32929) = (24105+31896) = (24105+31897) = (24105+32475) = (24105+32929) = (25225+31896) = (25225+31897) = (25225+32475) = (25225+32929) = (22013+31896+32332+32475) = (22013+31897+32333+32929) = (24105+31896+32332+32475) = (24105+31896+32332+32475) = (25225+31896+32332+32475) = (25225+31897+32333+32929)
0130	Mod : (26968+26999+28238+31896) = (26999+27831+28238+31897) = (26999+27381+28238+32475) = (26999+27831+28238+32929) = (26968+26999+28238+31896+32332+32475) = (26968+26999+28238+31897+32333+32929) = (26999+27831+28238+31896+32332+32475) = (26999+27831+28238+31897+32333+32929)
0131	Mod : 31896 = 31897 = 32475 = 32929 = (26111+31896) = (26111+31897) = (26111+32475) = (26111+32929) = (26999+28218+32475) = (26999+28218+32929) = (26999+28495+31896) = (26999+28495+31897) = (26999+28495+32475) = (26999+28495+32929) = (31896+32332+32475) = (31897+32333+32929) = (26111+31896+32332+32475) = (26111+31897+32333+32929) = (26999+28495+31896+32332+32475) = (26999+28495+31897+32333+32929) = (26999+28218+28382+28495+31896) = (26999+28218+28382+28495+28382+31897) = (26999+28218+28382+28495+32475) = (26999+28218+28382+28495+32929) = (26999+28218+28382+28495+31896+32332+32475) = (26999+28218+28382+48495+31897+32333+32929)
0133	STD = Mod : (24309+28497) = (24309+28497+31897+32333) = (24309+28497+31896+32332)
0134	Mod : (24035+30368) = (24160+30368) = (24211+30368)

	CODE	DESIGNATION
	0138	Mod : (30368+31896) = (30368+31897) = (30368+32475) = (30368+32929) = (30368+31896+32332+32475) = (30368+31897+32333+32929) = (30368+31896+32332+35119)
	0140	STD = Mod : (28238+31896) = (28238+31897) = (28238+32401) = (28238+32402) = (28238+32475) = (28238+32929) = (28238+31896+32332+32475) = (28238+31897+32333+32929) = (282388+31896+32332+35119)
	0143	Mod : 32401 = 32402 = 32475 = 32929 = (31896+32402) = (31897+32401) = (31896+32332+32475) = (31897+32333+32929)
	0144	Mod : 32401 = 32402 = 32475 = 32929 = (31896+32402) = (31897+32401) = (31896+32332+32475) = (31897+32333+32929)
	0145	Mod : (24414+32401) = (24414+32402) = (24414+32475) = (24414+32929) = (24735+32401) = (24735+32402) = (24735+32475) = (24735+32929) = (25346+32401) = (25346+32402) = (25346+32475) = (25346+32929)
	0148	Mod : 31896 = 31897 = (26999+28495+31896) = (26999+28495+31897) = (31896+32332+35119)
	0150	Mod : (32475+33181) = (32929+33181) = (32402+33181) = (32401+33181)
	0151	Mod : 24035 = 24160 = (24189+24211) = (24189+24211)
	0153	STD = Mod : 32475 = 32929 = (31896+32332) = (31896+32402) = (31897+32333) = (31897+32401)
	0156	Mod : 32475 = 32401 = 32402 = 32929 = (31896+32402) = (31897+32401) = (32475+24035) = (32401+24035) = (32402+24035) = (32475+24160) = (32401+24160) = (32402+24160) = (32475+24211) = (32401+24211) = (32402+24211) = (24035+32929) = (24160+32929) = (24211+32929) = (31896+32402+24035) = (31897+32401+24035) = (31896+32402+24160) = (31897+32401+24160) = (31896+32332+32475) = (31896+32402+24211) = (31897+32401+24211) = (31897+32333+32929) = (31896+32332+32475+24211) = (31896+32332+32475+24035) = (31896+32332+32475+24160) = (24035+31897+32333+32929) = (24160+31897+32333+32929) = (24211+31897+32333+32929)
	0157	Mod : 32401 = 32402 = 32475 = 32929 = (31896+32402) = (31897+32401) = (31896+32332+32475) = (31897+32333+32929)
	0158	STD = Mod (32401+L) = (32402+L) = (32475+L) = (32929+L)
	0166	Mod : 32475 = 32401 = 32402 = 32929 = (31896+32402) = (31897+32401) = (23353+32475) = (23353+32929) = (31896+32332+32475) = (23353+28498+32475) = (23353+31896+32402) = (23353+31897+32401) = (31897+32333+32929) = (23353+28498+32929) = (23353+31896+32332+32475) = (23353+28498+31986+32332+32475) = (23353+31897+32333+32929) = (23353+28498+31897+32333+32929)
R R	0169	Mod : 34809 = 34313 = (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809)
R	0170	Mod :31896 = 31897 = 35119 = (31896+32332+35119)
	0171	Mod : 24035 = 24160 = 24211 = (24035+25863+28551)
	0173	Mod : (24035+31896) = (24035+31897) = (24035+32475) = (24035+32929) = (24211+31896) = (24211+31897) = (24211+32475) = (24211+32929) = (24035+31896+32332+35119) = (24211+31896+32332+35119) = (24035+25863+28551+31896) = (24035+25863+28551+31897) = (24035+25863+28551+32475) = (24035+25863+28551+32929) = (24035+25863+28551+31896+32332+35119)
R	0178	Mod : 31896 = 31897 = 35119 = (31896+32332+35119)
R R R	0179	Mod : 36562 = 36609 = 36772 = (31896+32402+34313+36562) = (31897+32401+34809+36772)
R R	0180	Mod : 36562 = 36609 = 36772 = (26497+34313+36562) = (26497+34809+36772)
R R R	0181	Mod : 36562 = 36609 = 36772 = (26968+31365+31896+34313+36562) = (27831+31364+31897+34809+36772)
R R	0182	Mod : 36562 = 36609 = 36772 = (26968+31365+31896+32402+34313+36562) = (27831+31364+31897+32401+34809+36772)

	CODE	DESIGNATION
R	0183	Mod : 34313 = 34809 = (31897+32401+34809) = (27831+32929+34809) = (28711+31364+32929+34809) = (27831+31364+32929+34809) = (28283+31365+32475+34313) = (26968+31365+32475+34313) = (26968+31365+31896+32402+34313) = (27831+31364+31897+32401+34809) = (27831+31364+31897+32929+34809) = (27831+31364+32333+32929+34809) = (26968+31365+31896+32332+32475+34313) = (27831+31364+31897+32333+32929+34809)
R	0184	Mod : 31896 = 31897 = (26968+35119) = (31896+32332+35119)
R	0185	Mod : 31896 = 31897 = (28968+31365+31896+32332+34313+36562) = (27831+31364+31897+32401+34809+36772)
R	0186	Mod : 34313 = 34809 = (27831+32929+34809) = (31897+32401+34809) = (26968+31365+32475+34313) = (27831+31364+32929+34809) = (28283+31365+32475+34313) = (28711+31364+32929+34809) = (27831+31364+31897+32401+34809) = (26968+31365+31896+32402+34313) = (27831+31364+31897+32929+34809) = (27831+31364+32333+32929+34809) = (26968+31365+31896+32332+32475+34313) = (27831+31364+31897+32333+32929+34809)
R	0187	Mod : 34313 = 34809 = (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809)
R	0188	Mod : 36562 = 36609 = 36772 = (32402+34313+36562) = (32401+34809+36772)
R	0189	Mod : 34313 = 34809 = (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809) = (31896+32332+32475+34313) = (31897+32333+32929+34809)
R	0190	Mod : 36562 = 36609 = 36772 = (31897+32401+34809+36772)
	0192	Mod : (28399+32475) = (28399+32929) = (28399+31896+32402)
	0193	Mod : 25205 = 26111 = 26999 = 28382 = 30241 = 30631 = (25205+26999+28495) = (26999+28382+28495)
	0197	Mod : 25295 = 27522 = (25295+28499+27522) = (25295+27522+28360)
	0199	Mod : 26111 = 25205 = 26999 = 28382 = 30241 = 26485 = 30631 = 30635 = (25205+26999+28495) = (26999+28485+28382) = (26999+31896+32332) = (26999+31897+32333) = (26999+28495+28382+31897+32333)
	0201	Mod : (24035+30368+31896) = (24035+30368+31897) = (24035+30368+31896+32332+35119)
	0203	Mod : STD = (31896+32332) = (31897+32333)
	0205	Mod : 31896 = 31897 = 32475 = 32929 = (31896+32332+32475) = (31897+32333+32929) = (31896+32332+35119)
	0206	Mod : 31896 = 31897 = 32475 = 32929 = (26999+28495+31896) = (26999+28495+32475) = (26999+28495+32929) = (31896+32332+32475) = (31897+32333+32929)
	0207	Mod : (25346+31896) = (24414+31896) = (24735+31896) = (25346+31897) = (24414+31897) = (24735+31897) = (24414+31896+32332+35119) = (24735+31896+32332+35119) = (25346+31896+32332+35119)
	0210	Mod : (26999+31896) = (26999+31897) = (28382+31897) = (26999+32475) = (26999+32929) = (26999+31896+32332+32475) = (26999+31897+32333+32929) = (26999+28382+28495+31896) = (26999+28382+28495+31897) = (26999+28382+28495+32475) = (26999+28495+28382+32929) = (26999+28495+28382+31896+32332+32475) = (26999+28495+28382+31897+32333+32929)
	0214	STD = Mod : (26999+28495) = (27917+29999)
	0215	Mod : 25205 = 26111 = 26999 = 28382 = 30241 = 30631 = (25205+26999+28495) = (26999+28382+28495)
	0216	Mod : 31896 = 31897 = 32475 = 32929 = (31896+32332+32475) = (25295+27522+28360+31896)
	0217	Mod : (24414+31896) = (25346+31896) = (25346+31897) = (24414+31897) = (24414+31896+32332+35119) = (25346+31896+32332+35119)

CODE	DESIGNATION
0218	Mod : 25205 = 26111 = 26485 = 26999 = 28382 = 30241 = 30641 = (23885+26111) = (25205+26999+28495) = (26999+28382+28495) = (26999+28382+28495+31897+32333) = (26999+28382+28495+31896+32332) = (26999+31897+32333) = (26999+31896+32332)
0219	STD = Mod : 32475 = 32929 = (31896+32332) = (31896+32402) = (31897+32333) = (31897+32401)
0220	STD = Mod : 32475 = 32929 = (31896+32332) = (31896+32402) = (31897+32333) = (31897+32401) = (28399+31896+32332)
0221	STD = Mod : 32475 = 32929 = (31896+32332) = (31896+32402) = (31897+32333) = (31897+32401) = (32222+31896+32402)
0228	Mod : (27531+31579) = (27531+31580) = (27531+31896) = (27531+31987) = (27531+32475) = (27531+32929) = (27531+31896+32332+32475) = (27531+31897+32333+32929)
0230	Mod : (28399+31896+32402) = (28399+31897+32402) = (28399+31897+32233
0231	Mod : 32929 = 32401 = 32402 = 32475
0232	Mod : 32929 = 32401 = 32402 = 32475 = (31896+32332+32475) + (31897+32333+32929) = (31896+32402) = (31897+32401)
0236	Mod : 32475 = 32401 = 32402 = 32929 = (31896+32402) = (31897+32401) = (31896+32332+32475) = (31897+32333+32929)
0240	Mod : 30368 = (30368+31896+32332) = (30368+31897+32333)
0241	Mod : 25205 = 26111 = 26999 = 30631 = 30635 = 28382 (25205+26999+28495) = (26999+28382+28495)
0242	Mod : 25205 = 26111 = 26485 = 26999 = 28382 = 30241 = 30631 = 30635 = (25205+26999+28495) = (26999+28382+28495) = (26999+31896+32332) = (26999+31897+32333) = (26999+28218+31896+32332) = (26999+28382+28495+31896+32332) = (26999+28382+28495+31897+32333) = (22013+25204+26999+31896+32332)
0247	Mod : 25295 = 27522 = (25295+27522) = (25295+27522+31896) = (25395+27522+31897) = (25295+27522+28360) = (25295+27522+28360+31896)
0248	Mod : (25295+27522+32475) = (25295+27522+32929) = (25295+27522+32401) = (25295+27522+31897+32929) = (25295+27522+31897+32401) = (25295+27522+31896+32402)
0249	Mod : 32929 = 32475= (31897+32401) = (31896+32402) = (31897+32333+32929) = (31896+32332+32475)
0250	Mod : 26497 = (26497+31896) = (26497+32475) = (26497+31896+32332) = (26497+31897+32333)
0252	Mod : 32401 = 32402 = 32475 = 32929 = (31896+32402) = (31897+32401) = (31897+32929) = (31896+32332+32475) = (31897+32333+32929)
0253	Mod :24035 = 24160 = 24211 = (24035+30368+35270)
0257	Mod : STD = (30368+35270) = (31283+34861) = (31283+34862) = (31283+34864) = (30368+31283+35270) = (30368+31283+34861) = (30368+31283+34864) = (30368+31283+34862+35270)
0263	Mod : 28238 = 28378 = (28238+31896+32332) = (28238+31897+32333) = (28378+31896+32332) = (28378+31897+32333)
0265	Mod : (32401+33036) = (32402+32997) = (32475+32997) = (32929+33036)
0267	Mod : 32401 = 32402 = 32475 = 32929 = (31896+32402) = (31897+32401) = (31897+32929) = (32401+32929) = (31896+32332+32475) = (31897+32333+32929) = (31896+32402+32475) = (31897+32401+32929)
0268	Mod : 32475 = 32401 = 32402 = 32929 = (31896+32332+32475) = (31897+32333+32929)

CODE	DESIGNATION
0270	Mod : 24035 = 24160 = 24211 = (24035+32475) = (24035+32929) = (24160+32475) = (24160+32929) = (24211+32475) = (24211+32929) = (24035+31896+32332) = (24035+31896+32402) = (24035+31897+32333) = (24035+31897+32401) = (24160+31896+32332) = (24160+31896+32402) = (24160+31897+32333) = (24160+31897+32401) = (24211+31896+32332) = (24211+31896+32402) = (24211+31897+32333) = (24211+31897+32401) = (24035+31897+32929)
0271	STD = Mod : (25295+28499) = (27522+28360) = (31896+32332) = (31897+32333) = (25295+27522+28360+28499) = (25295+27522+27831+28360+28499+31364+31897+32333)
0273	Mod : STD = 32475 = 32929 = (31896+32332) = (31897+32333) = (31897+32401) = (31896+32402) = (31897+32929) = (31896+32332+32475) = (31897+32333+32929) = (28960+31897+32401) = (31897+32401+32456)
0274	STD = Mod : (26999+27917) = (26999+28495) = (26999+28495+31896) = (26999+28495+32475) = (26999+28495+31896+32402)
0275	Mod : (26999+32475) = (26999+32929) = (28382+32475) = (30631+32475) = (26999+32401) = (26999+31896+32402) = (26999+31897+32401) = (26999+31896+32332+32475) = (26999+31897+32333+32929) = (26999+28382+28495+32475) = (26999+28495+28382+32929) = (26999+28382+28495+31896+32402) = (26999+28495+28382+31897+32401) = (26999+28495+28382+31896+32332+32475) = (26999+28495+28382+31897+32333+32929)
0276	Mod : 32401 = 32402 = 32475 = 32929 = (31896+32402) = (31897+32401) = (31896+32332+32475) = (31897+32333+32929) = (24035+31896+32402) = (24035+31897+32401) = (24160+31896+32402) = (24160+31897+32401) = (24211+31896+32402) = (24211+31897+32401) = (24035+31897+32929) = (24035+31896+32332+32475) = (24035+30368+31896+32402+35270) = (24035+30368+31897+32401+35270)
0277	Mod : (24035+30368+32929) = (24035+30368+32401) = (24035+30368+31896+32402) = (24035+30368+31897+32401) = (24035+30368+31897+32333+32929) = (24035+30368+31896+32332+32475)
0278	Mod : (26497+32929) = (26497+32475) = (26497+31896+32402) = (26497+31897+32401) = (26497+31897+32929) = (26497+31897+32333+32929) = (26497+31896+32332+32475)
0279	Mod : 32401 = 32402 = 32475 = 32929 = (28238+32929) = (28378+32929) = (28238+32475) = (28378+32475) = (31896+32402) = (31897+32401) = (31896+32332+32475) = (31897+32333+32929) = (28238+31897+32401) = (28238+31896+32332+32475) = (28378+31896+32332+32475) = (28238+31897+32333+32929) = (28378+31897+32333+32929)
0283	Mod : 31896 = 31897 = 32475 = 32929 = (31896+32332+32475) = (27831+31364+31897+32333+32929)
0284	Mod : 31896 = 31897 = 32475 = 32929 = (31896+32332+32475) = (31897+32333+32929) = (25295+27831+31897) = (25295+27831+31364+32929) = (25295+27522+27831+32929) = (25295+27522+27831+31897) = (25295+26968+27522+31896) = (25295+26968+27522+32475) = (25295+26968+31365+32475) = (27831+31364+31897+32333+32929) = (25295+26968+27522+31365+31896) = (25295+26968+27522+31365+32475) = (25295+27522+27831+31364+31897) = (25295+27522+27831+31364+32929) = (25295+26968+27522+28360+28499+32475) = (25295+26968+27522+28360+31365+31896) = (25295+27522+27831+31364+31897+32929) = (25295+27522+27831+31364+32333+32929) = (25295+26968+27522+28360+28499+31365+32475) = (25295+26968+27522+31365+31896+32332+32475) = (25295+27522+27831+28360+28499+31364+31867) = (25295+27522+27831+28360+28499+31364+32929) = (25295+27522+27831+31364+31897+32333+32929)
0286	Mod : (25295+27522+28360+28499+32475) + (25295+27522+28360+28499+31897)

CODE	DESIGNATION
0288	STD = Mod : 32475 = 32929 = (31896+32402) = (31897+32333) = (31897+32401) = (26999+31896+32332) = (26999+31896+32402) = (26999+31896+32333) = (26999+31897+32401) = (26999+28495+31896+32402) = (26999+28495+31896+32332) = (26999+28495+21897+32333) = (26999+28382+28495+31896+32402) = (26999+28382+28495+31897+32929)
0290	Mod : (32401+25381) = (32402+25381) = (32475+25381) = (32929+25381) = (31896+32402+25381) = (31897+32401+25381) = (31896+32332+32475+25381) = (31897+32333+32929+25381) = (25381+31897+32929)
0292	STD = Mod : 32401 = 32402 = 32475 = 32929 = (31896+32332) = (31897+32333) = (31896+32402) = (31897+32401) = (31897+32929) = (28238+31897+32401) = (31896+32402+32475) = (31897+32401+32929)
0294	STD = Mod : 31897 = 32475 = 32929
0295	STD = Mod : 31896 = 31897 = (31896+32332) = (31897+32333)
0296	STD = Mod : (25225+28399) = (25225+28399+31896+32332)
0297	Mod : 25381 = (25381+31896+32332) = (25381+31897+32333)
0301	STD = Mod : 25295 = (25381+28500) = (31896+32332) = (31897+32333) = (25295+25381+27522+28500) = (25381+28500+31896+32332) = (25381+28500+31897+32333) = (25295+25381+28360+28500) = (25295+25381+27522+28360+28500) = (25295+25381+27522+28360+28499+28500) = (25295+25381+27522+28500+31896+32332) = (25295+25381+27522+28500+31897+32333) = (25295+25381+27522+28360+28500+31896+32332) = (25295+25381+27522+28360+28500+31897+32333) = (25295+25381+27522+28360+28499+28500+31896+32332) = (25295+25381+27522+28360+28499+28500+31897+32333)
0303	Mod :25295 = 27522 = (25295+31896+32332) = (25295+31897+32333) = (27522+31896+32332) = (27522+31897+32333) = (25295+27522+31897+32333) = (25295+27522+31896+32332)
0306	Mod : STD = 31896 = 31897 = 32475 = 32929 = (25295+28499) = (27522+28360) = (31896+32402) = (31897+32401) = (25295+32475) = (25295+32929) = (27522+32475) = (27522+32929) = (31896+32332+32475) = (31897+32333+32929) = (25295+28499+31896) = (25295+28499+31897) = (27522+28360+31896) = (27522+28360+31897) = (25295+28499+31896+32402) = (25295+28499+31897+32401) = (27522+28499+31896+32402) = (27522+28499+31897+32401) = (25295+28499+31896+32332) = (25295+28499+31897+32333) = (27522+28360+31896+32332) = (27522+28360+31897+32333) = (25295+28499+31896+32332+32475) = (25295+28499+31897+32333+32929) = (27522+28360+31896+32332+32475) = (27522+28360+31897+32333+32929)
0307	STD = Mod : 32401 = 32402 = 32475 = 32929 = (31896+32332) = (31897+32403) = (31897+32929) = (31896+32402) = (31897+32401)
0308	26968 = 27831 = 28283 = 28711 = 31364 = 31365 = (26968+31896+32332)
0309	25295 = 27522 = (25295+26968) = (25295+27831) = (25295+28283) = (27522+27831) = (25295+28499+27522) = (25295+27522+28360) = (25295+26968+31896+32332) = (25295+27522+27831+31364+31897+32333)
0310	Mod: 25863 = (25863+28551+34195)
0311	Mod: STD = (32929+34076) = (31897+34076)

CODE	DESIGNATION
0313	Mod : (24035+25863+31896) = (24035+25863+31897) = (24035+25863+32475) = (24035+25863+32929) = (24211+25863+31896) = (24211+25863+31897) = (24211+25863+32475) = (24211+25863+32929) = (24035+25863+31896+32332+32475) = (24035+25863+31897+32332+32929) = (24035+25863+28551+31896+34195) = (24035+25863+28551+31897+34195) = (24035+25863+28551+32475+34195) = (24035+25863+28551+32929+34195) = (24211+25863+31896+32332+35119) = (24211+25863+28551+32475+34195) = (24035+25863+31896+32332+35119) = (24035+25863+28551+31896+32332+32475+34195) = (24035+25863+28551+31896+32332+34195+35119) = (24035+25863+28551+31897+32333+32929+34195)
0314	Mod: (25863+31896) = (25863+31897) = (25863+32475) = (25863+32929) = (25863+28551+32929+34195) = (25863+31896+32332+35119)
0317	Mod : 25381 = 27522 = (25295+25381+28499) = (25381+27522+28390) = (25381+31896+32332) = (25381+31897+32333) = (25295+25381+27522+28360+28499) = (25295+25381+28499+31896+32332) = (25295+25381+28499+31897+32333) = (25381+27522+28360+31896+32332) = (25381+27522+28360+31897+32333) = (25295+25381+27522+28360+28499+31896+32332) = (25295+25381+27522+28360+28499+31897+32333)
0318	Mod : (25295+25381) = (25295+27522) = (25295+25381+27522) = (25295+25381+27522+28360) = (25295+25381+31896+32332) = (25295+25381+31897+32333) = (25295+25381+27522+31896+32332) = (25295+25381+27522+31897+32333) = (25295+25381+27522+28360+31896+32332) = (25295+25381+27522+28360+31897+32333)
0321	Mod : STD = 25800 = (31896+32332) = (31897+32333)
0324	Mod : 34313 = 34809 = (27831+31364+31897+32333+32929+34809) = (26968+31365+31896+32332+32475+34313)
0326	Mod : 34313 = 34809 = (31897+32333+32929+34809) = (31897+32401+34809) = (31896+32332+32475+34313) = (31896+32402+34313)
0327	Mod :31896 = 31897 = (31896+32332+35119)
0328	Mod : 34313 = 34809 = (31897+32333+32929+34809) = (31897+32401+34809) = (31896+32332+32475+34313) = (31896+32402+34313) = (31897+32929+34809)
0330	Mod : 34313 = 34809 = (31897+32333+32929+34809) = (31897+32401+34809) = (31896+32332+32475+34313) = (31896+32402+34313) = (31897+32929+34809) = (32333+32929+34809)
0331	Mod : (26999+32475) = (26999+32401) = (26999+32929) = (28382+32475) = (30631+32475) = (25205+32929) = (30241+31896+32402)
0333	26968 = 27831 = 28283 = 28711 = 31364 = 31365 = (26968+31896+32332) = (25295+26968+28499+31365) = (25295+26968+27522+28360+28499) = (25295+27522+27831+28360+28499) = (25295+26968+27522+28360+28499+31365) = (25295+27522+27831+28360+28499+31364+31897+32333)
0334	STD = Mod : (25295+28499) = (27522+28360) = (31896+32332) = (31897+32333) = (25295+27522+28360+28499) = (25295+27522+28360+28499+31897+32333)
0337	STD = Mod : 32475 = 32929 = 34313 = 34809 = (31896+32332) = (31896+32402) = (31897+32333) = (31897+32401) = (31897+32929) = (31896+32402+34313) = (31897+32401+34809) = (31897+32929+34809) = (31896+32332+32475+34313) = (31897+32333+32929+34809)
0338	Mod : 34313 = 34809 = (31896+32402+34313) = (31897+32401+34809) = (31897+32929+34809) = (31896+32332+32475+34313) = (31897+32333+32929+34809)
0339	Mod : 34313 = 34809 = (31896+32402+34313) = (31897+32401+34809) = (31896+32332+32475+34313) = (31897+32333+32929+34809)
0343	Mod : (25295+27522+31897+32333+32929) = (25295+27522+28360+28499+32929)

	CODE	DESIGNATION
	0345	Mod : (26968+31365+34313) = (28283+31365+34313) = (27831+31364+34809) = (26968+28283+31365+34313) = (26968+28283+31896+34313) = (27831+31364+31897+34809) = (27831+31364+32333+34809) = (26968+31896+32332+34313) = (27831+31364+31897+32333+34809)
	0346	Mod : (32929+34809) = (32475+34313) = (32333+32929+34809) = (31897+32929+34809) = (31897+32401+34809) = (31896+32402+34313) = (31897+32333+32929+34809) = (31896+32332+32475+34313)
	0351	Mod : 34313 = 34809 = (31896+32332+32475+34313) = (31896+32402+34313) = (31897+32333+32929+34809) = (31897+32401+34809) = (31897+32929+34809) = (32333+32929+34809) = (32475+34313) = (32929+34809)
	0352	Mod : 34313 = 34809 = (28960+31897+32401+34809) = (31896+32332+32475+34313) = (31896+32402+34313) = (31897+32333+32929+34809) = (31897+32401+34809) = (31897+32929+34809) = (32333+32929+34809) = (32475+34313) = (32929+34809)
	0353	Mod : 34313 = 34809 = (23742+24035+34313) = (23742+24035+34809) = (23742+24189+34313)
	0354	Mod : 34313 = 34809 = (31896+32332+32475+34313) = (31897+32333+32929+34809) = (31896+32402+34313) = (31897+32401+34809)
	0360	Mod : (28238+31896) = (28238+31897) = (28238+31896+32332+35119)
	0363	Mod : 31896 = 31897 = 32475 = 32929 = (31896+32332+35119)
	0364	Mod : (31897+33909) = (31896+33910) = (31896+32332+35119+33909)
	0365	Mod : (25295+33909) = (27522+33909) = (25295+33910) = (27522+33910) = (25295+27522+33909)
	0369	Mod :31896 = 31897 = 34313 = 34809 = (31896+32332+35119) = (31896+32402+34313) = (31897+32401+34809) = (31897+32929+34809) = (31896+32332+32475+34313) = (31897+32333+32929+34809)
	0370	Mod : 31896 = 31897 = (31897+32401+35651) = (31896+32332+35119) = (25295+25381+27522+28360+28500+31897)
	0372	Mod : 32401 = 32402 = 32475 = 32929 = (25295+32929) = (31896+32402) = (25295+25381+27522+28360+28500+32475) = (25295+25381+27522+28360+28500+32929)
	0373	Mod : (25381+32475) = (25295+25381+32475) = (25295+25381+27522+32475) = (25295+25381+27522+32929) = (25295+25381+27522+31897+32401) = (25295+25381+27522+31897+32929) = (25295+25381+27522+31896+32402) = (25295+25381+27522+31896+32332+32475) = (25295+25381+27522+31897+32333+32929)
R	0374	Mod : (25295+27522+27831+28360+28499+31897)
R	0376	Mod : 36562 = 36609 = 36772 = (31896+32402+34313+36562) = (31897+32401+34809+36772)
R	0377	Mod :31896 = 31897 = 35119 = (31896+32332+35119)
R	0378	Mod : (25205+31896) = (25205+31897) = (26111+31896) = (26111+31897) = (26485+31896) = (26485+31897) = (26999+31896) = (26999+31897) = (28382+31896) = (28382+31897) = (30241+31896) = (30241+31897) = (30631+31896) = (30631+31897) = (30635+31896) = (30635+31897) = (26999+35119) = (26999+28382+28495+31896) = (26999+28382+28495+31897) = (25205+31896+32332+35119) = (26111+31896+32332+35119) = (26485+31896+32332+35119) = (26999+31896+32332+35119) = (28382+31896+32332+35119) = (30241+31896+32332+35119) = (30631+31896+32332+35119) = (30635+31896+32332+35119) = (26999+28382+28495+31896+32332+35119)
R	0379	Mod : 36562 = 36609 = 36772 = (34313+36562) = (34809+36772)
R	0380	Mod : 34313 = 34809 = (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809) = (31896+32332+32475+34313) = (31897+32333+32929+34809)
R	0381	Mod : 31896 = 31897 = 32402 = 32401 = 32475 = 32929 = 35119 = (31896+32402) = (31897+32401) = (31896+32332+32475) = (31897+32333+32929) = (31896+32332+35119)

CODE	DESIGNATION
0382	Mod : CFM 56-5-B4 = CFM 56-5-B8 = CFM 56-5-B9 = (CFM 56-5-B4/25800) = (CFM 56-5-B4/25800+27727) = (CFM 56-5-B4/25800+35119) = (CFM 56-5-B9/25800+31896) = (31896+25530) = (32475+25530) = (25800+32475) = (25800+31896) = (31896+27727) = (25800+35119) = (25800+34313) = (CFM 56-5-B4/31896+32332) = (31896+25530+27727) = (32475+25530+27727) = (31896+32332+32475+27727) = (31896+32332+32475+25530) = (25800+31896+32332+32475) = (25530+31896+32332+35119) = (25800+31896+32332+35119) =(27727+31896+32332+35119) = (31896+32332+32475+25530+27727)
0383	Mod : 31896 = 31897 = 32475 = 32401 = 32402 = 32929 = 34313 = 34809 = 36609 = 36772 = 36562 = (31896+32332+32475) = (31897+32333+32929) = (31896+25530+26505) = (32475+25530+26505) = (31896+32332+3275+25530+26505) = (31896+32332+35119)
0384	Mod : (24035+30368+32929+34809) = (24035+30368+31897+32401+34809) = (24035+30368+31896+32402+34313) = (24035+30368+31897+32333+32929+34809) = (24035+30368+31896+32332+32475+34313)
0385	Mod : 31896 = 31897 = (24035+31896) = (24035+31897) = (24160+31896) = (24160+31897) = (24211+31896) = (24211+31897) = (24035+35119) = (31896+32332+35119) = (24035+30368+31896+35270)
0386	Mod : (24035+30368+31896+32402+34313+35270) = (24035+31896+32332+32475+34313) = (24035+31896+32402+34313) = (24035+31897+32333+32929+34809) = (24035+31897+32401+34809) = (24035+31897+32401+34809+35270) = (24035+31897+32929+34809) = (24035+32929+34809) = (24035+32333+32929+34809) = (24035+32475+34313) = (24211+32475+34313) = (24035+30368+31987+32401+34809+35270)
0387	Mod : (24035+30368) = (24035+30368+31896+32332) = (24035+30368+31897+32333)
0388	Mod : 31896 = 31897 = 32475 = 32929 = 35119 = (31896+32332+32475) = (31897+32333+32929) = (31896+30368+35270) = (31897+30368+35270) = (31896+32332+35119)
0389	Mod : (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809) = (32475+34313) = (31896+32402+34313) = (31896+32232+32475+34313) = (31897+32333+32929+34809)
0390	Mod : (24414+36562) = (24414+36772) = (24414+24735+25346+32401+34809+36772) = (24414+24735+25346+32402+34313+36562)
0391	Mod : (24414+34809) = (24414+34313) = (24414+24735+25346+32401+34809) = (24414+24735+25346+32402+34313)
0392	Mod : 36562 = 36609 = 36772 = (32401+34809+36772) = (32402+34313+36562)
0393	Mod : 34313 = 34809 = (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809)
0394	Mod : 36562 = 36609 = 36772 = (34896+32402+34313+36562) = (31897+32401+34809+36772) = (28960+31897+32401+34809+36772) = (28238+31896+32402+34313+36562)
0395	Mod : 31896 = 31897 = 35119 = (28960+31897) = (28960+31896) = (32456+31896) = (31897+32456) = (31896+32332+35119) = (28960+31896+32332+35119) = (31896+32332+32456+35119)
0396	Mod : 36562 = 36609 = 36772 = (31896+34313+36562) = (31897+34809+36772)
0397	Mod : 36562 = 36609 = 36772 = (31896+32402+34313+36562) = (31897+32401+34809+36772) = (28238+31896+32402+34313+36562)
0398	Mod : 31896 = 31897 = 35119 = (28238+31896) = (28238+31897) = (28378+31896) = (28378+31897) = (31896+32332+35119) = (28238+31896+32332+35119) = (28378+31896+32332+35119)
0399	Mod : 31896 = 31897 = (24035+31896) = (24035+31897) = (24160+31896) = (24160+31897) = (24211+31896) = (24211+31897) = (24035+35119) = (31896+32332+35119) = (24035+31896+32332+35119) = (24160+31896+32332+35119) = (24211+31896+32332+35119)

CODE	DESIGNATION
0400	Mod : 31896 = 31897 = 32475 = 32929 = (31905+35119) = (31896+32332+32475) = (31897+32333+32929)= (31896+32332+35119) = (24105+31364+31906+32929) = (24105+31365+31905+32475)
0401	Mod :31896 = 31897 = 35119 = (31896+32332+35119)
0402	Mod : 34313 = 34809 = (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809)
0403	Mod : 31896 = 31897 = 32401 = 32402 = 32475 = 32929 = 34076 = 35119 = (34076+35651) = (31896+32332+35119) = (31896+32332+32475) = (31897+32333+32929+34076)
0405	Mod : (25205+31896) = (25205+31897) = (26111+31896) = (26111+31897) = (26485+31896) = (26485+31897) = (26999+31896) = (26999+31897) = (28382+31896) = (28382+31897) = (30241+31896) = (30241+31897) = (30631+31896) = (30631+31897) = (30635+31896) = (30635+31897) = (26999+35119) = (26999+28382+28495+31896) = (26999+28382+28495+31897) = (25205+31896+32332+35119) = (26111+31896+32332+35119) = (26485+31896+32332+35119) = (26999+31896+32332+35119) = (28382+31896+32332+35119) = (30241+31896+32332+35119) = (30631+31896+32332+35119) = (30635+31896+32332+35119) = (26999+28382+28495+31896+32332+35119)
0406	Mod : 31579 = 31580 = 31896 = 31897 = 32475 = 32929 = 35119= (31896+32332+32475) = (31897+32333+32929) = (31896+32332+35119)
0407	Mod : 31896 = 31897 = 32475 = 32929 = (26968+35119) = (31896+32332+32475) = (31897+32333+32929) = (31896+32332+35119)
0408	Mod : 34313 = 34809 = (31897+32401+34809) = (27831+31364+31897+32401+34809) = (27831+31364+31897+32333+32929+34809) = (26968+31365+31896+32402+34313) = (26968+31365+31896+32332+32475+34313
0409	Mod : 31896 = 31897 = 32475 = 32929 = 35119 = (31896+32332+32475) = (31897+32333+32929) = (31896+32332+35119)
0410	Mod : 31896 = 31897 = (26968+35119) = (31896+32332+35119)
0411	Mod : 36562 = 36609 = 36772 = (26968+31365+31896+32402+36562) = (27831+31364+31897+32401+36772)
0412	Mod : 26968 = 27831 = 28283 = 28711 = 31364 = 31365 = 31897 = (31896+32332) = (31897+32333)
0413	Mod : 25205 = 26111 = 26485 = 26999 = 28382 = 30241 = 30631 = 30635 = (25205+26999+28495) = (26999+28382+28495)
0414	Mod : 24035 = 24160 = 24211 = (31896+32222) = (31896+32332) = (31897+32333) = (32475+32997) = (32929+33036) = (32402+32997) = (32401+33036) = (32929+32997) = (32929+34076) = (32401+34076) = (24035+31896+34573) = (24035+32929+34076) = (24035+32929+34076) = (24035+31897+34076) = (24211+31896+34573) = (31896+32332+32475+32997) = (31897+32333+32929+33036) = (31897+32333+32929+32997) = (24035+31896+32222+34573) = (24035+31896+32402+32997+34573) = (24035+31897+32333+32929+34076)
0415	Mod : 31896 = 31897 = (24035+31896) = (24035+31897) = (24160+31896) = (24160+31897) = (24211+31896) = (24211+31897) = (24035+35119) = (24035+31896+32332+35119) = (24160+31896+32332+35119) = (24211+31896+32332+35119)
0416	Mod : 32262 = 32766 = 35538 = (23593+32262) = (23593+32766) = (23593+27256+28829+32262) = (23593+27256+28829+32766) = (23593+27541+28829+32262) = (23593+27541+28829+32766) = (23593+27256+27541+28829+35538)
0417	Mod : 31896 = 31897 = 35119 = (31896+32332+35119)
0419	Mod : (28399+35119) = (28399+31896) = (28399+31897) = (28399+31896+32332+35119)
0420	Mod : 34313 = 34809 = (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809)

CODE	DESIGNATION
0421	Mod : 31896 = 31897 = 32475 = 32929 = 35119 = (31896+32332+32475) = (31897+32333+32929) = (31896+32332+35119)
0422	Mod : (24035+25863) = (24160+25863) = (24211+25863) = (31897+35526) = (31897+32333+35526) = (24035+25863+31896+32222) = (24035+25863+31896+32332) = (24035+25863+31897+32333) = (24035+25863+31896+34573) = (24035+25863+28551+34195) = (24211+25863+28551+34195) = (24211+25863+31896+34573) = (24035+25863+31896+32222+34573) = (24035+25863+31896+32222+28551+34195) = (24035+25863+31896+32332+28551+34195) = (24035+25863+31897+32333+28551+34195) = (24035+25863+31896+34573+28551+34195) = (24035+25863+31896+32332+34573+35119) = (24035+25863+31896+32222+34573+28551+34195)
0423	Mod : (24035+25863+34076) = (24035+25863+32929+34076) = (24035+25863+31897+34076) = (24035+25863+31897+32929+34076) = (24035+25863+31897+32333+32929+34076) = (24035+25863+28551+32929+34076+34195)
0424	Mod : 31896 = 31897 = 32402 = 32401 = 32475 = 32929 = 35119 = (31896+32402) = (31897+32401) = (31896+32332+32475) = (31897+32333+32929) = (31896+32332+35119)
0425	STD = Mod : (28238+31896) = (28238+31897) = (28378+31896) = (28378+31897) = (31896+32332+35119) = (28238+31896+32332+35119) = (28378+31896+32332+35119)
0426	Mod : 36562 = 36609 = 36772 = (34313+36562) = (34809+36772)
0427	Mod : 31896 = 31897 = 32475 = 32929 = (24588+31896) = (24588+35119) = (24588+25490+31896) = (24588+25490+32475) = (31896+32332+32475) = (31897+32333+32929) = (31896+32332+35119)
0428	Mod : 31579 = 31580 = 31896 = 31897 = 32401 = 32402 = 32475 = 32929 = 35119 = (31579+31896+32332) = (31580+31897+32333) = (31896+32332+35119) = (31579+31896+32332+35119)
0429	Mod : 31896 = 31897 = (23353+31896) = (23353+31897) = (31896+32332+35119) = (23353+28498+35119) = (23353+31896+32332+35119)
0430	Mod : 31896 = 31897 = 32475 = 32929 = (23353+28498+31896) = (23353+28498+31897) = (23353+28498+32475) = (31896+32332+32475) = (23353+28498+32929) = (31897+32333+32929) = (31896+32332+35119) = (23353+28498+35119) = (23353+28498+31896+32332+35119) = (23353+28498+31896+32332+32475) = (23353+28498+31897+32333+32929)
0431	Mod : 34313 = 34809 = (32401+34809) = (32402+34313) = (32475+34313) = (32929+34809) = (31896+32402+34313) = (31896+32232+32475+34313) = (31897+32333+32929+34809)
0432	Mod : 36562 = 36609 = 36772 = (32401+34809+36772) = (32402+34313+36562)
0433	Mod : (31896+32222) = (31896+34573) = (31897+35526) = (31896+32222+34573) = (31896+32402+34573) = (31897+32333+35526) = (31896+32222+32332+35119)
0434	Mod : (25295+25381+31897) = (25295+25381+31896) = (25295+25381+27522+35119) = (25295+25381+27522+31897) = (25295+25381+27522+31896) = (25295+25381+27522+28360+31896) = (25295+25381+27522+31896+32332+35119)
0435	Mod : 36562 = 36609 = 36772 = (34809+36772) = (34313+36562)
0436	Mod : (27522+34313) = (27522+34809) = (25295+34313) = (25295+34809) = (25295+27522+34313) = (25295+27522+34809) = (25295+27522+28360+28499+34809)
0437	Mod : (25295+36562) = (25295+36609) = (25295+36772) = (27522+36562) = (27522+36609) = (27522+36772) = (25295+27522+34313+36562) = (25295+27522+34809+36772)

CODE	DESIGNATION
0438	Mod : (27522+34313) = (27522+34809) = (25295+34313) = (25295+34809) = (25295+27522+32929+34809) = (25295+27522+32475+34313) = (25295+27522+31896+32402+34313) = (25295+27522+32333+32929+34809) = (25295+27522+31897+32929+34809) = (25295+27522+31897+32401+34809) = (25295+27522+31897+32333+32929+34809) = (25295+27522+28360+28499+32929+34809) = (25295+27522+31896+32332+32475+34313)
0439	Mod : (25295+31896) = (25295+31897) = (27522+31896) = (27522+31897) = (25295+27522+35119) = (25295+31896+32332+35119) = (27522+31896+32332+35119) = (25295+27522+28360+31896)
0440	Mod : (25295+34076) = (25295+34078) = (27522+34076) = (27522+34078) = (25295+32475) = (25295+32929) = (25295+32475) = (27522+32929) = (25295+31896+32402) = (25295+31897+32401) = (27522+31896+32402) = (27522+31897+32401) = (25295+31896+32332+32475) = (25295+31897+32333+32929) = (27522+31896+32332+32475) = (27522+31897+32333+32929) = (25295+27522+31897+32333+32929)
0441	Mod : (27522+34313) = (27522+34809) = (25295+34313) = (25295+34809) = (25295+27522+34313) = (25295+27522+34809) = (25295+27522+32475+34313) = (25295+27522+32929+34809) = (25295+27522+31896+32475+34313) = (25295+27522+31896+32402+34313) = (25295+27522+31897+32401+34809) = (25295+27522+31897+32929+34809) = (25295+27522+28360+28499+32929+37809)
0442	Mod : (25281+34313) = (25381+34809) = (25381+32929+34809) = (25381+32475+34313) = (25381+31897+32929+34809) = (25381+31897+32401+34809) = (25381+32333+32929+34809) = (25381+31896+32402+34313) = (25831+28500+32929+34809) = (25381+31896+32332+32475+34313) = (25381+31897+32333+32929+34809)
0443	Mod : (25381+31896) = (25381+31897) = (25381+35119) = (25381+31896+32332+35119)
0444	Mod : (25381+36562) = (25381+36609) = (25381+36772) = (25381+34313+36562) = (25381+34809+36772)
0445	Mod : (25381+34313) = (25381+34809)
0446	Mod : (25381+36562) = (25381+36609) = (25381+36772) = (25381+31896+34313+36562) = (25381+31897+32401+34809+36772)
0447	Mod : (25381+34313) = (25381+34809) = (31896+25381+34313) = (31897+25381+34809) = (25381+28500+34809) = (31896+32332+25381+34313) = (31897+32401+25381+34809)
0448	Mod : (34313+25381) = (25381+34809) = (25381+28500+34313) = (25381+31896+34313) = (25381+31897+34809) = (25381+28500+34809) = (25381+31896+32332+34313) = (25381+31897+32401+34809)
0450	Mod : (26999+31896) = (26999+31897) = (26999+35119) = (28382+31897) = (26999+28382+28495+31896) = (26999+28382+28495+31897) = (26999+31896+32332+35119)

R

N°	ISSUE DATE	
00	APR 1992	
01	JUN 1992	
02	SEP 1993	
03	JUN 1994	
04	SEP 1995	
05	MAR 1997	
06	APR 1998	
07	DEC 1998	
08	SEP 1999	
09	MAR 2000	
10	SEP 2000	
11	APR 2001	
12	OCT 2001	
13	MAR 2002	
14	DEC 2002	
15	AUG 2003	
16	MAY 2004	
17	JUL 2005	
18	JUN 2006	
19	JAN 2007	

N°	TITLE	STATUS	LOCATION
To be filled by the operator, if needed.			

THIS TABLE GIVES, FOR EACH AIRCRAFT INCLUDED IN THE MANUAL, THE CROSS REFERENCE BETWEEN :

- THE MANUFACTURING SERIAL NUMBER (MSN) WHICH APPEARS IN THE LIST OF EFFECTIVE PAGES

- THE REGISTRATION NUMBER OF THE AIRCRAFT AS KNOWN BY AIRBUS INDUSTRIE.

MSN	REGISTRATION
0990	CC-CZB
1304	CC-COC
1332	CC-COD
1351	CC-COE
1355	CC-COF
1491	CC-COG
1512	CC-COH
1526	CC-COI
1548	CC-COK
1568	CC-COL
1626	CC-COM
1854	LV-BET
1858	LV-BFY
1877	LV-BFO
1903	CC-COT
2089	CC-COU
2096	CC-COX
2295	CC-COY
2304	CC-COZ
2321	CC-CPE
2572	CC-CPF
2585	CC-CPI
2845	CC-CPJ
2858	CC-CPL
2864	CC-CPM
2872	CC-CPO
2886	CC-CPQ
2887	CC-CPX
2892	CC-CQK
2894	CC-CQL
3001	CC-CVA
3030	CC-CVB
3062	CC-CVF
3214	
3216	
3220	
3225	

V CH SEC ---PAGE--	SEQ-	--REV-- ----VALIDATION CRITERIA----- ----------REASONS OF CHANGE----------
4 02 00 001	001	REV019
		- TECHNICAL AMENDMENT 1)The Table of Contents has been updated to reflect FCOM revisions and take into account various pagination changes.
4 02 20 004A	001	REV019
		- TECHNICAL AMENDMENT 1)Page revised to remove the references to the MMEL, and to remove the FAA MMEL example previously provided on page 4B. Indeed, those dispatch conditions are not FCOM relevant.
4 02 20 007	130	REV018 CODE 0408
		- INCORPORATION OF MOD 34809
4 02 20 016	100	REV012 CODE 0412
		- INCORPORATION OF MOD 31897
4 02 30 003	100	REV015 CODE 0280
		- DELETION OF MOD 32401
4 03 00 001	001	REV019 CODE:0055
		- TECHNICAL AMENDMENT 1)The Table of Contents has been updated to reflect FCOM revisions and take into account various pagination changes.
4 03 00 002	001	REV019 CODE:0055
		- TECHNICAL AMENDMENT 1)The Table of Contents has been updated to reflect FCOM revisions and take into account various pagination changes.
4 03 10 001	120	REV014 CODE 0416
		- INCORPORATION OF MOD 35538
4 03 25 012	100	REV019 CODE 0170
		- TECHNICAL AMENDMENT 1)Page revised for aircraft with FMS2 Pegasus Standard, to clarify that ZFWCG is not defaulted at 25 per cent.
4 03 25 094	100	REV019 CODE 0417
		- TECHNICAL AMENDMENT 1)Page revised to improve the wording of the conditions that trigger the MCDU message "CHECK TAKEOFF DATA".

V CH SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA----- REASONS OF CHANGE----------
4 03 25	104	106	REV019	CODE 0433 - INCORPORATION OF MOD 35526
4 03 28	003	130	REV019	EQUI 0393 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	004	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	005	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	007	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	010	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	010A	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	013	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	014	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

correct page validation for all customers.

4 03 28 014A 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 015 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 016 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 018 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 019 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 021 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 022 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 024 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

V CH SEC	PAGE	SEQ	REV	VALIDATION CRITERIA / REASONS OF CHANGE
4 03 28	025	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	027	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	028	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	029	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	031	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	035	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	036	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	039	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

4 03 28 040 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 041 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 043 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 044 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 045 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 047 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 049 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 053 102 REV019 CODE 0169

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

V CH SEC	PAGE	SEQ	REV	VALIDATION CRITERIA / REASONS OF CHANGE
4 03 28	064	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	078	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	086	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	087	102	REV019	CODE 0114 - INCORPORATION OF MOD 34809 - TECHNICAL AMENDMENT 1)Page created for aircraft with the FMS2 Thales/Smiths : The (2L) field of PERF CRZ page displays "RTA CI", if an RTA has been inserted in the flight plan.
4 03 28	088	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	090	102	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	091	105	REV019	CODE 0169 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	092	130	REV019	EQUI 0393 - TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

V CH SEC	PAGE	SEQ	REV	VALIDATION CRITERIA / REASONS OF CHANGE
4 03 28	105	130	REV019 EQUI 0393	- TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	106	130	REV019 EQUI 0393	- TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	108	130	REV019 EQUI 0393	- TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	109	130	REV019 EQUI 0393	- TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	110	130	REV019 EQUI 0393	- TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	111	130	REV019 EQUI 0393	- TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	112	130	REV019 EQUI 0393	- TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.
4 03 28	113	130	REV019 EQUI 0393	- TECHNICAL AMENDMENT 1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

4 03 28 114 130 REV019 EQUI 0393

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 115 130 REV019 EQUI 0393

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 116 130 REV019 EQUI 0393

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 117 130 REV019 EQUI 0393

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 28 118 130 REV019 EQUI 0393

- TECHNICAL AMENDMENT
1)No technical change. The sequence number has been changed to ensure correct page validation for all customers.

4 03 35 003 100 REV019 CODE 0178

- TECHNICAL AMENDMENT
1)Page revised to improve the wording of the conditions that trigger the MCDU message "CHECK TAKEOFF DATA".

4 03 38 001 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 03 38 002 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

4 03 38 003 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 03 38 004 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 03 38 005 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 03 38 006 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 03 38 007 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 03 38 008 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 03 38 009 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 03 38 010 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

4 03 38 011 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 03 40 002 100 REV016 CODE 0403

- INCORPORATION OF MOD 34076

4 03 40 003 102 REV019 CODE 0420

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 00 001 001 REV019 CODE 0055

- TECHNICAL AMENDMENT
1)The Table of Contents has been updated to reflect FCOM revisions and take into account various pagination changes.

4 04 00 001 110 REV019 31896=31897

- TECHNICAL AMENDMENT
1)The Table of Contents has been updated to reflect FCOM revisions and take into account various pagination changes.

4 04 00 001 130 REV019 CODE 0330

- TECHNICAL AMENDMENT
1)The Table of Contents has been updated to reflect FCOM revisions and take into account various pagination changes.

4 04 00 001 200 REV019 31897+35891

- INCORPORATION OF MOD 35891
- TECHNICAL AMENDMENT
1)Page created to reflect FCOM revisions : the POLAR NAVIGATION item has been moved from 4.04.30 to 4.04.32.

4 04 18 001 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 003 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change. The sequence

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

number has been changed to ensure the good page validation for all customers.

4 04 18 003A 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 003B 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 004 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 011 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 014 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 019 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 020 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 023 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

all customers.

4 04 18 024 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 027 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 038 115 REV019 CODE 0189

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 039 115 REV019 CODE 0189

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 040 115 REV019 CODE 0189

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 041 115 REV019 CODE 0189

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 042 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 18 043 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

4 04 18 044 110 REV019 CODE 0187

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 04 28 001 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 04 28 002 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 04 28 002A 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 04 28 003 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 04 28 003A 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 04 28 004 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

4 04 28 005 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to
ensure the correct page validation for
all customers.

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

4 04 28 006 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 28 006A 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 28 007 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 28 008 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 28 009 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 28 010 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 28 011 110 REV019 CODE 0402

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 04 30 010 001 REV019 CODE 0055

- TECHNICAL AMENDMENT
1)Page revised to clarify the description of the flight management function in the case of an engine-out.

V CH SEC	PAGE	SEQ	REV	VALIDATION CRITERIA / REASONS OF CHANGE
4 04 30	010	110	REV019	CODE 0170 - TECHNICAL AMENDMENT 1)Page revised to clarify the description of the flight management function in the case of an engine-out.
4 04 30	010	130	REV019	CODE 0339 - TECHNICAL AMENDMENT 1)Page revised to clarify the description of the flight management function in the case of an engine-out.
4 04 30	016	100	REV019	M:26497 - TECHNICAL AMENDMENT 1)Page revised to clarify that in descent and in engine-out conditions, DES mode reverts to V/S mode if the aircraft is above the EO REC Max Altitude. If not, the Descent mode is maintained. 2)Page revised to clarify that for engine-out approach phase, to further specify the AP and FD bank angle conditions, in order to be in line - ADDITIONAL INFORMATION with FCOM 3.02.10 and 4.04.30 P 10a.
4 04 30	016	130	REV019	MOD 34313 + 34809 - TECHNICAL AMENDMENT 1)Page revised to clarify that in descent and in engine-out conditions, DES mode reverts to V/S mode if the aircraft is above the EO REC Max Altitude. If not, the Descent mode is maintained. 2)Page revised to clarify that for engine-out approach phase, to further specify the AP and FD bank angle conditions, in order to be in line - ADDITIONAL INFORMATION with FCOM 3.02.10 and 4.04.30 P 10a.
4 04 32	001	100	REV019	M:35891 - INCORPORATION OF MOD 35891 - TECHNICAL AMENDMENT 1)Page created to move information about the Polar Navigation function from the OTHER FUNCTIONS Chapter to the POLAR NAVIGATION Chapter.
4 04 32	002	100	REV019	M:35891 - INCORPORATION OF MOD 35891 - TECHNICAL AMENDMENT 1)Page created to move information about the Polar Navigation function from the OTHER FUNCTIONS Chapter to the POLAR NAVIGATION Chapter.

V CH SEC	PAGE	SEQ	REV	VALIDATION CRITERIA / REASONS OF CHANGE
4 04 32	003	100	REV019 M:35891	- INCORPORATION OF MOD 35891 - TECHNICAL AMENDMENT 1)Page created to move information about the Polar Navigation function from the OTHER FUNCTIONS Chapter to the POLAR NAVIGATION Chapter.
4 04 32	004	100	REV019 M:35891	- INCORPORATION OF MOD 35891 - TECHNICAL AMENDMENT 1)Page created to move information about the Polar Navigation function from the OTHER FUNCTIONS Chapter to the POLAR NAVIGATION Chapter.
4 04 32	005	100	REV019 M:35891	- INCORPORATION OF MOD 35891 - TECHNICAL AMENDMENT 1)Page created to move information about the Polar Navigation function from the OTHER FUNCTIONS Chapter to the POLAR NAVIGATION Chapter.
4 04 32	006	100	REV019 M:35891	- INCORPORATION OF MOD 35891 - TECHNICAL AMENDMENT 1)Page created to move information about the Polar Navigation function from the OTHER FUNCTIONS Chapter to the POLAR NAVIGATION Chapter.
4 04 32	007	100	REV019 M:35891	- INCORPORATION OF MOD 35891 - TECHNICAL AMENDMENT 1)Page created to move information about the Polar Navigation function from the OTHER FUNCTIONS Chapter to the POLAR NAVIGATION Chapter.
4 04 32	008	100	REV019 M:35891	- INCORPORATION OF MOD 35891 - TECHNICAL AMENDMENT 1)Page created to move information about the Polar Navigation function from the OTHER FUNCTIONS Chapter to the POLAR NAVIGATION Chapter.
4 04 32	009	100	REV019 M:35891	- INCORPORATION OF MOD 35891 - TECHNICAL AMENDMENT 1)Page created to move information about the Polar Navigation function from the OTHER FUNCTIONS Chapter to the POLAR NAVIGATION Chapter.

V CH SEC ---PAGE-- SEQ-	--REV-- ----VALIDATION CRITERIA----- ----------REASONS OF CHANGE----------
4 04 32 010 100	REV019 M:35891 - INCORPORATION OF MOD 35891 - TECHNICAL AMENDMENT 1)Page created to move information about the Polar Navigation function from the OTHER FUNCTIONS Chapter to the POLAR NAVIGATION Chapter.
4 04 40 001 204	REV019 CODE 0436 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure correct page validation for all customers.
4 04 40 002 100	REV019 CODE 0197 - TECHNICAL AMENDMENT 1)Page revised to clarify the different FMS logics and conditions for flight plan (F-PLN) uplinks to the SEC F-PLN, and to reflect that a SEC F-PLN uplink can be directly inserted in the SEC F-PLN without flight crew action.
4 04 40 002 204	REV019 CODE 0436 - TECHNICAL AMENDMENT 1)Page revised to clarify the different FMS logics and conditions for flight plan (F-PLN) uplinks to the SEC F-PLN, and to reflect that a SEC F-PLN uplink can be directly inserted in the SEC F-PLN without flight crew action. 2)The sequence number was changed to ensure correct page validation for all customers.
4 04 40 003 204	REV019 CODE 0436 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure correct page validation for all customers.
4 04 40 004 206	REV019 CODE 0438 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure correct page validation for all customers.
4 04 40 005 204	REV019 CODE 0436 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure correct page validation for all customers.
4 04 40 006 100	REV019 CODE 0197 - TECHNICAL AMENDMENT 1)Page revised to clarify the different FMS logics and conditions for

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

inserting uplinked wind data in the SEC F-PLN, and to reflect that uplinked wind data can be directly inserted in the F-PLN without flight crew action.

4 04 40 006 204 REV019 CODE 0436

- TECHNICAL AMENDMENT
  1)Page revised to clarify the different FMS logics and conditions for inserting uplinked wind data in the SEC F-PLN, and to reflect that uplinked wind data can be directly inserted in the F-PLN without flight crew action.
  2)The sequence number was changed to ensure correct page validation for all customers.

4 04 40 007 204 REV019 CODE 0436

- TECHNICAL AMENDMENT
  1)No technical change. The sequence number was changed to ensure correct page validation for all customers.

4 04 40 008 202 REV019 CODE 0441

- TECHNICAL AMENDMENT
  1)No technical change. The sequence number was changed to ensure correct page validation for all customers.

4 04 50 001 206 REV019 CODE 0442

- TECHNICAL AMENDMENT
  1)No technical change. The sequence number was changed to ensure correct page validation for all customers.

4 04 50 002 204 REV019 CODE 0445

- TECHNICAL AMENDMENT
  1)No technical change. The sequence number was changed to ensure correct page validation for all customers.

4 04 50 003 100 REV019 25381

- TECHNICAL AMENDMENT
  1)Page revised in order to correct FM report values.

4 04 50 003 200 REV019 M:25381+34313=25381+34809

- TECHNICAL AMENDMENT
  1)Page revised in order to correct FM report values.

4 04 50 004 205 REV019 CODE 0104

- INCORPORATION OF MOD 31897
- TECHNICAL AMENDMENT
  1)Page created in order to take into account FMS2 Honeywell features

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

applicable to printing the INFLIGHT REPORT.

4 04 50 004 210 REV019 CODE 0447

- INCORPORATION OF MOD 31897
- INCORPORATION OF MOD 32401
- TECHNICAL AMENDMENT
  1)No technical change. The sequence number was changed to ensure correct page validation for all customers.

4 04 50 005 100 REV019 25381

- TECHNICAL AMENDMENT
  1)Page revised in order to correct FM report values.

4 04 50 005 200 REV019 M:25381+34313=25381+34809

- TECHNICAL AMENDMENT
  1)Page revised in order to correct FM report values.

4 04 50 006 205 REV019 M:31896+25381=25381+31897

- INCORPORATION OF MOD 31897
- TECHNICAL AMENDMENT
  1)Page created in order to take into account FMS2 Honeywell features applicable to printing the POSTFLIGHT REPORT.

4 04 50 006 210 REV019 CODE 0448

- INCORPORATION OF MOD 31897
- INCORPORATION OF MOD 32401
- TECHNICAL AMENDMENT
  1)No technical change. The sequence number was changed to ensure correct page validation for all customers.

4 04 50 007 100 REV019 25381

- TECHNICAL AMENDMENT
  1)Page revised in order to correct FM report values.

4 04 50 007 200 REV019 M:25381+34313=25381+34809

- TECHNICAL AMENDMENT
  1)Page revised in order to correct FM report values.

4 05 00 002 001 REV019 STD=25863+28551

- TECHNICAL AMENDMENT
  1)The Table of Contents has been updated to reflect FCOM revisions and take into account various pagination changes.

4 05 00 002 100 REV019 CODE 0310

- TECHNICAL AMENDMENT
  1)The Table of Contents has been updated

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

to reflect FCOM revisions and take into account various pagination changes.

4 05 10 010 105 REV018 CODE 0186

- INCORPORATION OF MOD 34809

4 05 50 008 103 REV019 CODE 0380

- TECHNICAL AMENDMENT
  1)No technical change. The sequence number has been changed to ensure the good page validation for all customers.

4 05 50 014 100 REV018 CODE 0383

- INCORPORATION OF MOD 32401
- INCORPORATION OF MOD 34809

4 05 60 004 403 REV019 CODE 0384

- TECHNICAL AMENDMENT
  1)Page created in order to take into account the following aircraft configuration :
  - FMS2 Thales/Smiths REV2
  - EIS2

4 05 70 011 001 REV019 CODE 0257

- TECHNICAL AMENDMENT
  Page revised to update the callouts in order to be in accordance with the standard callout list in FCOM 3.03.90 :
  1)At 350 ft RA, the PF announces "LAND", instead of "LAND GREEN"
  2)If external visual references are sufficient, the PF announces "CONTINUE", instead of "LANDING"
  3)If external visual references are not sufficient, the PF announces
- ADDITIONAL INFORMATION
  "GO-AROUND, FLAPS", instead of "GO-AROUND".

4 05 70 011 200 REV019 30368+31283

- TECHNICAL AMENDMENT
  Page revised to update the callouts in order to be in accordance with the standard callout list in FCOM 3.03.90 :
  1)At 350 ft RA, the PF announces "LAND", instead of "LAND GREEN"
  2)If external visual references are sufficient, the PF announces "CONTINUE", instead of "LANDING"
  3)If external visual references are not sufficient, the PF announces
- ADDITIONAL INFORMATION
  "GO-AROUND, FLAPS", instead of "GO-AROUND".

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

4 05 70 012 001 REV019

- TECHNICAL AMENDMENT
  Page revised to update the callouts in order to be in accordance with the standard callout list in FCOM 3.03.90 :
  1)At 350 ft RA, the PF announces "LAND", instead of "LAND GREEN"
  2)If external visual references are sufficient, the PF announces "CONTINUE", instead of "LANDING"
  3)If external visual references are not sufficient, the PF announces
- ADDITIONAL INFORMATION
  "GO-AROUND, FLAPS", instead of "GO-AROUND".

4 05 70 013 001 REV019

- TECHNICAL AMENDMENT
  Page revised to update the callouts in order to be in accordance with the standard callout list in FCOM 3.03.90 :
  1)At 350 ft RA, the PF announces "LAND", instead of "LAND GREEN"
  2)If external visual references are sufficient, the PF announces "CONTINUE", instead of "LANDING"
  3)If external visual references are not sufficient, the PF announces
- ADDITIONAL INFORMATION
  "GO-AROUND, FLAPS", instead of "GO-AROUND".

4 05 70 013A 001 REV019

- TECHNICAL AMENDMENT
  Page revised to update the callouts in order to be in accordance with the standard callout list in FCOM 3.03.90 :
  1)At 350 ft RA, the PF announces "LAND", instead of "LAND GREEN"
  2)At 100 ft RA, the PF announces "CONTINUE", instead of "LANDING".

4 05 70 026 001 REV019

- TECHNICAL AMENDMENT
  1)Page revised to be in accordance with the illustration in FCOM 4.05.70 P28 : When the aircraft reaches the MDA/MDH, and visual references are not acquired, a go-around must be initiated.

4 05 70 028 100 REV019 M:24035=24160=24211

- TECHNICAL AMENDMENT
  1)Page revised to be in accordance with the procedure in FCOM 4.05.70 P24 : Airbus' standard philosophy for all Non Precision Approaches (NPAs) is to use the "stabilized" approach technique. With this technique, the aircraft descends in final approach,

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

on a stabilized path, to the MDA. When the aircraft reaches the MDA, the Pilot Flying makes the decision

- ADDITIONAL INFORMATION
whether to continue or discontinue the approach, depending on the visual references.
2)Note added to be in line with the SOP 3.03.19 P 11 : in cases where a step descent is performed down to the MDA, a level-off at the MDA may be performed.

4 05 80 002 307 REV019 CODE 0423

- INCORPORATION OF MOD 34076
- TECHNICAL AMENDMENT
1)Page created to take into account the following aircraft configuration :
-FMGC S2I9
-CPIP3
-automatic FD bars at Go-around.

4 05 80 005 100 REV019 M:(24035=24160=24211)

- TECHNICAL AMENDMENT
1)Page revised to update the callouts in order to be in accordance with the standard callout list in FCOM 3.03.90 : When the rate of climb is positive, the PF announces "GEAR UP", instead of "gear retraction".

4 06 00 001 001 REV019 CODE:0055

- TECHNICAL AMENDMENT
1)The Table of Contents has been updated to reflect FCOM revisions and take into account various pagination changes.

4 06 00 001 115 REV019 CODE 0354

- TECHNICAL AMENDMENT
1)The Table of Contents has been updated to reflect FCOM revisions and take into account various pagination changes.

4 06 20 006 100 REV019 24588=24588+31897+32333

- TECHNICAL AMENDMENT
1)Page revised to extend the "Spurious engine-out" procedure to all occurrences of spurious engine-out instead of describing it only for a particular case linked to IAE engines.

4 06 20 006 110 REV019 CODE 0427

- TECHNICAL AMENDMENT
1)Page revised to introduce information about spurious engine-out indications, and to provide the applicable procedure in order to clear these spurious indications.

V CH SEC	PAGE	SEQ	REV	VALIDATION CRITERIA / REASONS OF CHANGE
4 06 20	008	001	REV019	CODE:0055 - TECHNICAL AMENDMENT 1)Page revised to provide the Operators with recommendations to avoid a map shift at takeoff, which may occur when the approach of the previous flight was a "LOC-only" approach.
4 07 18	002	105	REV019	CODE 0431 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure the correct page validation for all customers.
4 07 18	003	105	REV019	CODE 0431 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure the correct page validation for all customers.
4 07 18	005	105	REV019	CODE 0431 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure the correct page validation for all customers.
4 07 18	006	105	REV019	CODE 0431 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure the correct page validation for all customers.
4 07 18	008	105	REV019	CODE 0431 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure the correct page validation for all customers.
4 07 18	009	105	REV019	CODE 0431 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure the correct page validation for all customers.
4 07 18	011	105	REV019	CODE 0431 - TECHNICAL AMENDMENT 1)No technical change. The sequence number was changed to ensure the correct page validation for all customers.

V CH SEC ---PAGE-- SEQ- --REV-- ----VALIDATION CRITERIA-----
----------REASONS OF CHANGE----------

4 07 18 012 105 REV019 CODE 0431

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 07 18 013 105 REV019 CODE 0431

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 07 18 014 105 REV019 CODE 0431

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

4 07 18 015 105 REV019 CODE 0431

- TECHNICAL AMENDMENT
1)No technical change.
The sequence number was changed to ensure the correct page validation for all customers.

M	V	CH	SEC	PAGE	SEQ	REV	VALIDATION CRITERIA	EFFECTIVITY
M	V	CH	SEC	PAGE	SEQ	REV	VALIDATION CRITERIA	EFFECTIVITY
	4	00	00	001-2	001	REV007		ALL
	4	00	10	001	001	REV018	ORGANIZATION OF THE MANUAL	ALL
	4	00	10	002	001	REV018	ORGANIZATION OF THE MANUAL	
	4	00	10	003	001	REV007	ORGANIZATION OF THE MANUAL	ALL
	4	00	10	004	001	REV007	ORGANIZATION OF THE MANUAL	
	4	00	10	005	001	REV007	ORGANIZATION OF THE MANUAL	ALL
R	4	00	20	001	001	REV019	LIST OF CODES	ALL
R	4	00	20	002	001	REV019	LIST OF CODES	
R	4	00	20	003	001	REV019	LIST OF CODES	ALL
R	4	00	20	004	001	REV019	LIST OF CODES	
R	4	00	20	005	001	REV019	LIST OF CODES	ALL
R	4	00	20	006	001	REV019	LIST OF CODES	
R	4	00	20	007	001	REV019	LIST OF CODES	ALL
R	4	00	20	008	001	REV019	LIST OF CODES	
R	4	00	20	009	001	REV019	LIST OF CODES	ALL
R	4	00	20	010	001	REV019	LIST OF CODES	
R	4	00	20	011	001	REV019	LIST OF CODES	ALL
R	4	00	20	012	001	REV019	LIST OF CODES	
R	4	00	20	013	001	REV019	LIST OF CODES	ALL
R	4	00	20	014	001	REV019	LIST OF CODES	
R	4	00	30	001	001	REV019	LIST OF NORMAL REVISIONS	ALL
	4	00	35	001	001	REV006	RECORD OF TEMPORARY REVISION	ALL
R	4	00	36	001	001	REV019	LIST OF EFFECTIVE TEMP.REV.	ALL
R	4	00	70	001	001	REV019	CROSS REFERENCE TABLE	ALL
R	4	00	75	001	001	REV019	HIGHLIGHTS	ALL
R	4	00	80	001	001	REV019	LIST OF EFFECTIVE PAGES	ALL
R	4	00	85	001	001	REV019	LIST OF MODIFICATIONS	ALL
	4	01	00	001	001	REV006		ALL
	4	01	10	001	001	REV006		ALL
	4	01	10	002	001	REV006		
R	4	02	00	001	001	REV019		ALL
	4	02	10	001	001	REV006		ALL
	4	02	20	001	001	REV006		0990
	4	02	20	002	100	REV015	CODE:0101	
	4	02	20	001	001	REV006		1304-2894
	4	02	20	002	220	REV015	CODE 0405	

M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
	4	02	20	001	001	REV006		3001-3225
	4	02	20	002	240	REV015	CODE 0331	
	4	02	20	003	100	REV008	CODE:0193	0990
	4	02	20	004	001	REV010	CODE 0055	
	4	02	20	003	100	REV008	CODE:0193	1304-3225
	4	02	20	004	110	REV014	CODE 0406	
R	4	02	20	004A	001	REV019		ALL
	4	02	20	005	001	REV006		0990
	4	02	20	006	100	REV011	CODE 0056	
	4	02	20	005	001	REV006		1304-2894
	4	02	20	006	110	REV014	CODE 0407	
	4	02	20	005	001	REV006		3001-3225
	4	02	20	006	130	REV018	CODE 0324	
	4	02	20	007	100	REV011	CODE 0056	0990
	4	02	20	008	001	REV006	CODE 0055	
	4	02	20	007	100	REV011	CODE 0056	1304-2894
	4	02	20	008	110	REV014	CODE 0377	
N	4	02	20	007	130	REV018	CODE 0408	3001-3225
N	4	02	20	008	120	REV017	CODE 0143	
	4	02	20	009	001	REV014	CODE 0055	0990
	4	02	20	010	001	REV018		
	4	02	20	009	110	REV014	CODE 0377	1304-2894
	4	02	20	010	001	REV018		
	4	02	20	009	120	REV017	CODE 0143	3001-3225
	4	02	20	010	130	REV018	MOD 34313 + 34809	
	4	02	20	011	001	REV014	CODE 0055	0990
	4	02	20	012	001	REV006	CODE 0055	
	4	02	20	011	110	REV014	CODE 0409	1304-2894
	4	02	20	012	110	REV014	CODE 0377	
	4	02	20	011	110	REV014	CODE 0409	3001-3225
	4	02	20	012	130	REV018	CODE 0326	
	4	02	20	013	001	REV006		0990
	4	02	20	014	100	REV014	CODE 0056	
	4	02	20	013	001	REV006		1304-2894
	4	02	20	014	110	REV014	CODE 0410	
	4	02	20	013	001	REV006		3001-3225
	4	02	20	014	120	REV015	CODE 0143	
	4	02	20	015	100	REV014	CODE 0056	0990
	4	02	20	016	100	REV012	CODE 0412	

M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
	4	02	20	015	110	REV014	CODE 0410	1304-2894
	4	02	20	016	100	REV012	CODE 0412	
N	4	02	20	015	120	REV014	CODE 0143	3001-3225
N	4	02	20	016	100	REV012	CODE 0412	
	4	02	20	017	001	REV006		0990
	4	02	20	018	001	REV017	CODE 0055	
	4	02	20	017	001	REV006		1304-2894
	4	02	20	018	105	REV017	CODE 0377	
	4	02	20	017	001	REV006		3001-3225
	4	02	20	018	130	REV018	CODE 0326	
	4	02	20	019	001	REV006		ALL
	4	02	20	020	100	REV015	CODE 0413	
	4	02	20	021	001	REV006		0990-2894
	4	02	20	022	001	REV014		
	4	02	20	021	130	REV018	MOD 34313 + 34809	3001-3225
	4	02	20	022	120	REV014	CODE 0143	
	4	02	30	001	001	REV006		ALL
	4	02	30	002	001	REV014		
	4	02	30	003	100	REV015	CODE 0414	0990 3001-3225
	4	02	30	004	100	REV006	M:24035 OR 24160 OR 24211	
	4	02	30	003	120	REV015	CODE 0205	1304-2894
	4	02	30	004	100	REV006	M:24035 OR 24160 OR 24211	
	4	02	30	005	100	REV006	CODE 0270	0990 3001-3225
	4	02	30	006	001	REV006		
	4	02	30	005	110	REV014	CODE 0415	1304-2894
	4	02	30	006	001	REV006		
	4	02	30	007	100	REV014	CODE 0056	0990
	4	02	30	008	105	REV017	24035+24160+24211	
	4	02	30	007	110	REV014	CODE 0410	1304-2321
	4	02	30	008	105	REV017	24035+24160+24211	
	4	02	30	007	110	REV014	CODE 0410	2572-2894
	4	02	30	008	200	REV017	M:30368+24035	
	4	02	30	007	120	REV015	CODE 0143	3001-3225
	4	02	30	008	200	REV017	M:30368+24035	
	4	02	30	009	001	REV006		ALL
	4	02	30	010	001	REV014		
	4	02	30	011	100	REV006	CODE 0253	0990-2321
	4	02	30	012	001	REV014		
	4	02	30	011	200	REV015	CODE 0134	2572-3225
	4	02	30	012	001	REV014		

M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
	4	02	30	013	100	REV008	M:24035=24160=24211	ALL
R	4	03	00	001	001	REV019	CODE:0055	0990
R	4	03	00	002	001	REV019	CODE:0055	
	4	03	00	001	110	REV014	CODE 0377	1304-2894
	4	03	00	002	110	REV014	CODE 0377	
	4	03	00	001	130	REV018	CODE 0328	3001-3225
	4	03	00	002	130	REV018	CODE 0328	
	4	03	10	001	100	REV013	27256	0990
	4	03	10	002	110	REV014	CODE 0033	
	4	03	10	001	105	REV008	M:27541=(27256+27541)	1304-2894
	4	03	10	002	110	REV014	CODE 0033	
N	4	03	10	001	120	REV014	CODE 0416	3001-3225
N	4	03	10	002	110	REV014	CODE 0033	
	4	03	10	003	001	REV013		ALL
	4	03	10	004	120	REV006	M.24035=24160=(24189+24211)	
	4	03	10	005	001	REV006		ALL
	4	03	20	001	001	REV006	CODE:0055	0990
	4	03	20	002	001	REV006	CODE:0055	
	4	03	20	003	100	REV011	CODE:0056	0990
	4	03	20	004	100	REV006	CODE:0056	
	4	03	20	005	105	REV018	CODE 0333	0990
	4	03	20	006	001	REV011	CODE:0055	
	4	03	20	007	001	REV006	CODE:0055	0990
	4	03	20	008	100	REV006	CODE:0056	
	4	03	20	009	100	REV011	CODE:0056	0990
	4	03	20	010	100	REV006	CODE:0056	
	4	03	20	011	100	REV008	CODE:0056	0990
	4	03	20	012	001	REV014	CODE:0055	
	4	03	20	013	001	REV018	CODE:0055	0990
	4	03	20	014	100	REV016	CODE:0056	
	4	03	20	015	100	REV006	CODE:0056	0990
	4	03	20	016	001	REV006	CODE:0055	
	4	03	20	017	001	REV011	CODE:0055	0990
	4	03	20	018	001	REV018	CODE:0055	
	4	03	20	019	001	REV006	CODE:0055	0990
	4	03	20	020	001	REV006	CODE:0055	
	4	03	20	021	001	REV006	CODE:0055	0990
	4	03	20	022	001	REV006	CODE:0055	

M V CH SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
4 03 20	023	001	REV011	CODE:0055	0990
4 03 20	024	001	REV006	CODE:0055	
4 03 20	025	001	REV011	CODE:0055	0990
4 03 20	026	001	REV014	CODE:0055	
4 03 20	027	001	REV007	CODE:0055	0990
4 03 20	028	001	REV006	CODE:0055	
4 03 20	029	001	REV006	CODE:0055	0990
4 03 20	030	001	REV016	CODE:0055	
4 03 20	031	001	REV006	CODE:0055	0990
4 03 20	032	105	REV011	CODE 0096	
4 03 20	033	100	REV007	CODE:0056	0990
4 03 20	034	100	REV006	CODE 0098	
4 03 20	035	001	REV006	CODE:0055	0990
4 03 20	036	001	REV006	CODE:0055	
4 03 20	037	001	REV006	CODE:0055	0990
4 03 20	038	001	REV006	CODE:0055	
4 03 20	039	001	REV011	CODE:0055	0990
4 03 20	040	001	REV006	CODE:0055	
4 03 20	041	001	REV011	CODE:0055	0990
4 03 20	042	001	REV006	CODE:0055	
4 03 20	043	001	REV011	CODE:0055	0990
4 03 20	044	001	REV015	CODE:0055	
4 03 20	045	001	REV011	CODE:0055	0990
4 03 20	046	001	REV018	CODE:0055	
4 03 20	047	001	REV006	CODE:0055	0990
4 03 20	048	001	REV007	CODE:0055	
4 03 20	049	001	REV015	CODE:0055	0990
4 03 20	050	001	REV013	CODE 0113	
4 03 20	051	001	REV006	CODE:0055	0990
4 03 20	052	100	REV014	CODE:0101	
4 03 20	053	100	REV017	CODE:0101	0990
4 03 20	054	100	REV014	CODE:0101	
4 03 20	055	105	REV009	CODE:0218	0990
4 03 20	056	001	REV006	CODE 0334	
4 03 20	057	001	REV006	CODE 0334	0990
4 03 20	058	001	REV006	CODE 0334	
4 03 20	059	001	REV006	CODE 0334	0990
4 03 20	060	001	REV006	CODE 0334	
4 03 20	061	001	REV006	CODE 0334	0990
4 03 20	062	001	REV006	CODE 0271	

M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
	4	03	20	063	001	REV006	CODE 0055	0990
	4	03	20	064	001	REV006	CODE 0301	
	4	03	20	065	001	REV006	CODE 0301	0990
	4	03	20	066	001	REV007	CODE:0055	
	4	03	20	067	001	REV011	CODE:0055	0990
	4	03	20	068	001	REV007	CODE:0055	
	4	03	20	069	001	REV016	CODE:0055	0990
	4	03	20	070	001	REV007	CODE:0055	
	4	03	20	071	001	REV014	CODE:0055	0990
	4	03	20	072	100	REV006	CODE:0056	
	4	03	20	073	100	REV006	CODE:0056	0990
	4	03	20	074	001	REV006	CODE:0055	
	4	03	20	075	001	REV006	CODE:0055	0990
	4	03	20	076	001	REV011	CODE:0055	
	4	03	20	077	001	REV008	CODE 0296	0990
	4	03	20	078	001	REV006	CODE:0055	
	4	03	20	079	001	REV006	CODE:0055	0990
	4	03	20	080	100	REV014	CODE:0101	
	4	03	20	081	100	REV018	CODE:0056	0990
	4	03	20	082	100	REV014	CODE:0101	
	4	03	20	083	100	REV014	CODE:0101	0990
	4	03	20	084	100	REV015	CODE 0199	
	4	03	20	085	100	REV006	CODE 0242	0990
	4	03	20	086	001	REV006	CODE:0055	
	4	03	20	087	001	REV006	CODE:0055	0990
	4	03	20	088	001	REV006	CODE:0055	
	4	03	20	089	105	REV006	CODE:0056	0990
	4	03	20	090	001	REV006	CODE 0334	
	4	03	25	001	100	REV012	CODE 0170	1304-2894
	4	03	25	002	100	REV012	CODE 0170	
	4	03	25	003	100	REV012	CODE 0170	1304-2894
	4	03	25	004	100	REV012	CODE 0170	
	4	03	25	005	100	REV012	CODE 0170	1304-2894
	4	03	25	006	100	REV012	CODE 0170	
	4	03	25	007	100	REV012	CODE 0170	1304-2894
	4	03	25	008	100	REV012	CODE 0170	
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	4	03	25	010	100	REV012	CODE 0170	
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R	4	03	25	012	100	REV019	CODE 0170	

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4 03 25 016	100	REV016	CODE 0170	
4 03 25 017	100	REV012	CODE 0170	1304-2894
4 03 25 018	100	REV012	CODE 0170	
4 03 25 019	100	REV012	CODE 0170	1304-2894
4 03 25 020	100	REV018	CODE 0170	
4 03 25 021	100	REV012	CODE 0170	1304-2894
4 03 25 022	100	REV012	CODE 0170	
4 03 25 023	100	REV012	CODE 0170	1304-2894
4 03 25 024	100	REV012	CODE 0170	
4 03 25 025	100	REV012	CODE 0417	1304-2894
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4 03 25 038	100	REV016	CODE 0417	
4 03 25 039	100	REV012	CODE 0417	1304-2894
4 03 25 040	100	REV012	CODE 0417	
4 03 25 041	100	REV012	CODE 0417	1304-2894
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4 03 25 049	100	REV012	CODE 0417	1304-2894
4 03 25 050	100	REV012	CODE 0417	
4 03 25 051	100	REV012	CODE 0417	1304-2894
4 03 25 052	100	REV012	CODE 0417	

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	4	03	25	057	100	REV012	CODE 0417	1304-2894
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	4	03	25	060	100	REV012	CODE 0417	
	4	03	25	061	100	REV012	CODE 0417	1304-2894
	4	03	25	062	100	REV015	CODE 0417	
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	4	03	25	065	100	REV012	CODE 0417	1304-2894
	4	03	25	066	100	REV012	CODE 0417	
	4	03	25	067	100	REV012	CODE 0417	1304-2894
	4	03	25	068	100	REV012	CODE 0417	
	4	03	25	069	100	REV012	CODE 0417	1304-2894
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	4	03	25	071	100	REV012	CODE 0417	1304-2894
	4	03	25	072	100	REV012	CODE 0417	
	4	03	25	073	100	REV012	CODE 0417	1304-2894
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	4	03	25	077	100	REV012	CODE 0417	1304-2894
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	4	03	25	079	100	REV012	CODE 0417	1304-2894
	4	03	25	080	100	REV012	CODE 0417	
N	4	03	25	081	100	REV012	CODE 0417	1304-2894
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	4	03	25	083	300	REV018	CODE 0434	1304-2894
	4	03	25	084	100	REV012	CODE 0417	
	4	03	25	085	100	REV012	CODE 0417	1304-2894
	4	03	25	086	100	REV012	CODE 0417	
	4	03	25	087	100	REV012	CODE 0417	1304-2894
	4	03	25	088	100	REV014	CODE 0417	
	4	03	25	089	100	REV014	CODE 0417	1304-2894
	4	03	25	090	100	REV012	CODE 0417	
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	4	03	25	095	100	REV016	CODE 0417	1304-2894
	4	03	25	096	100	REV012	CODE 0417	
	4	03	25	097	100	REV012	CODE 0417	1304-2894
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	4	03	25	099	100	REV012	CODE 0417	1304-2894
	4	03	25	100	100	REV012	CODE 0417	
	4	03	25	101	100	REV012	CODE 0417	1304-2894
	4	03	25	102	100	REV012	CODE 0417	
	4	03	25	103	100	REV012	CODE 0417	1304-2321
	4	03	25	104	100	REV015	CODE 0417	
N	4	03	25	103	100	REV012	CODE 0417	2572-2894
N	4	03	25	104	106	REV019	CODE 0433	
	4	03	25	105	100	REV012	CODE 0417	1304-2894
	4	03	25	106	100	REV012	CODE 0417	
	4	03	25	107	100	REV018	CODE 0417	1304-2894
	4	03	25	108	100	REV012	CODE 0417	
	4	03	25	109	200	REV015	CODE 0450	1304-2894
	4	03	25	110	200	REV015	CODE 0450	
	4	03	25	111	200	REV015	CODE 0450	1304-2894
	4	03	25	112	100	REV012	CODE 0417	
	4	03	25	113	100	REV012	CODE 0417	1304-2894
	4	03	25	114	100	REV012	CODE 0417	
	4	03	25	115	100	REV012	CODE 0417	1304-2894
	4	03	25	116	100	REV017	CODE 0417	
	4	03	25	117	100	REV012	CODE 0417	1304-2894
	4	03	25	118	100	REV012	CODE 0417	
	4	03	25	119	100	REV012	CODE 0417	1304-2894
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N	4	03	28	004	102	REV019	CODE 0169	
N	4	03	28	005	102	REV019	CODE 0169	3001-3225
N	4	03	28	006	100	REV015	MOD:32401=32402=32475=32929	
N	4	03	28	007	102	REV019	CODE 0169	3001-3225
N	4	03	28	008	100	REV018	32401=32402=32475=32929	
N	4	03	28	009	100	REV015	MOD:32401=32402=32475=32929	3001-3225
N	4	03	28	010	102	REV019	CODE 0169	

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	4	03	28	012	100	REV014	MOD:32401=32402=32475=32929	
N	4	03	28	013	102	REV019	CODE 0169	3001-3225
N	4	03	28	014	102	REV019	CODE 0169	
N	4	03	28	014A	102	REV019	CODE 0169	3001-3225
N	4	03	28	015	102	REV019	CODE 0169	3001-3225
N	4	03	28	016	102	REV019	CODE 0169	
N	4	03	28	017	100	REV014	MOD:32401=32402=32475=32929	3001-3225
N	4	03	28	018	102	REV019	CODE 0169	
N	4	03	28	019	102	REV019	CODE 0169	3001-3225
N	4	03	28	020	100	REV014	MOD:32401=32402=32475=32929	
N	4	03	28	021	102	REV019	CODE 0169	3001-3225
N	4	03	28	022	102	REV019	CODE 0169	
N	4	03	28	023	100	REV015	MOD:32401=32402=32475=32929	3001-3225
N	4	03	28	024	102	REV019	CODE 0169	
N	4	03	28	025	102	REV019	CODE 0169	3001-3225
N	4	03	28	026	100	REV014	MOD:32401=32402=32475=32929	
N	4	03	28	027	102	REV019	CODE 0169	3001-3225
N	4	03	28	028	102	REV019	CODE 0169	
N	4	03	28	029	102	REV019	CODE 0169	3001-3225
N	4	03	28	030	100	REV014	MOD:32401=32402=32475=32929	
N	4	03	28	031	102	REV019	CODE 0169	3001-3225
N	4	03	28	032	100	REV014	MOD:32401=32402=32475=32929	
	4	03	28	033	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	03	28	034	100	REV014	MOD:32401=32402=32475=32929	
N	4	03	28	035	102	REV019	CODE 0169	3001-3225
N	4	03	28	036	102	REV019	CODE 0169	
	4	03	28	037	100	REV016	MOD:32401=32402=32475=32929	3001-3225
	4	03	28	038	100	REV014	MOD:32401=32402=32475=32929	
N	4	03	28	039	102	REV019	CODE 0169	3001-3225
N	4	03	28	040	102	REV019	CODE 0169	
N	4	03	28	041	102	REV019	CODE 0169	3001-3225
N	4	03	28	042	100	REV014	MOD:32401=32402=32475=32929	
N	4	03	28	043	102	REV019	CODE 0169	3001-3225
N	4	03	28	044	102	REV019	CODE 0169	
N	4	03	28	045	102	REV019	CODE 0169	3001-3225
N	4	03	28	046	100	REV014	MOD:32401=32402=32475=32929	

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N	4	03	28	049	102	REV019	CODE 0169	3001-3225
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	4	03	28	052	100	REV014	MOD:32401=32402=32475=32929	
N	4	03	28	053	102	REV019	CODE 0169	3001-3225
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	4	03	28	056	100	REV014	MOD:32401=32402=32475=32929	
	4	03	28	057	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	03	28	058	100	REV014	MOD:32401=32402=32475=32929	
	4	03	28	059	100	REV015	MOD:32401=32402=32475=32929	3001-3225
	4	03	28	060	100	REV014	MOD:32401=32402=32475=32929	
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	4	03	28	062	100	REV014	MOD:32401=32402=32475=32929	
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N	4	03	28	064	102	REV019	CODE 0169	
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	4	03	28	066	100	REV015	MOD:32401=32402=32475=32929	
	4	03	28	067	100	REV015	MOD:32401=32402=32475=32929	3001-3225
	4	03	28	068	100	REV014	MOD:32401=32402=32475=32929	
	4	03	28	069	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	03	28	070	100	REV014	MOD:32401=32402=32475=32929	
	4	03	28	071	200	REV018	CODE 0373	3001-3225
	4	03	28	072	200	REV018	CODE 0373	
	4	03	28	073	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	03	28	074	100	REV014	MOD:32401=32402=32475=32929	
	4	03	28	075	100	REV014	MOD:32401=32402=32475=32929	3001-3225
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N	4	03	28	077	100	REV015	MOD:32401=32402=32475=32929	3001-3225
N	4	03	28	078	102	REV019	CODE 0169	
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	4	03	28	080	100	REV014	MOD:32401=32402=32475=32929	
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	4	03	28	082	100	REV016	MOD:32401=32402=32475=32929	
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	4	03	28	084	100	REV016	MOD:32401=32402=32475=32929	
N	4	03	28	085	100	REV015	MOD:32401=32402=32475=32929	3001-3225
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N	4	03	28	090	102	REV019	CODE 0169	
N	4	03	28	091	105	REV019	CODE 0169	3001-3225
N	4	03	28	092	130	REV019	EQUI 0393	
	4	03	28	093	100	REV015	MOD:32401=32402=32475=32929	3001-3225
	4	03	28	094	100	REV014	MOD:32401=32402=32475=32929	
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	4	03	28	096	100	REV018	MOD:32401=32402=32475=32929	
	4	03	28	097	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	03	28	098	100	REV014	MOD:32401=32402=32475=32929	
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	4	03	28	100	100	REV014	MOD:32401=32402=32475=32929	
	4	03	28	101	100	REV014	MOD:32401=32402=32475=32929	3001-3225
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	4	03	28	103	100	REV015	MOD:32401=32402=32475=32929	3001-3225
	4	03	28	104	100	REV015	MOD:32401=32402=32475=32929	
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	4	03	30	002	001	REV015	CODE:0055	
	4	03	30	003	001	REV006	CODE:0055	0990
	4	03	30	004	001	REV010	CODE:0055	
	4	03	30	005	001	REV006	CODE:0055	0990
	4	03	30	006	001	REV006	CODE:0055	
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	4	03	30	008	100	REV006	CODE:0058	

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	4	03	35	002	100	REV012	CODE 0178	
R	4	03	35	003	100	REV019	CODE 0178	1304-2894
R	4	03	35	004	100	REV012	CODE 0178	
	4	03	35	005	100	REV012	CODE 0178	1304-2894
	4	03	35	006	100	REV012	CODE 0178	
	4	03	35	007	100	REV012	CODE 0178	1304-2894
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	4	03	35	009	100	REV012	CODE 0178	1304-2894
	4	03	35	010	100	REV012	CODE 0178	
	4	03	35	011	100	REV012	CODE 0178	1304-2894
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N	4	03	38	002	102	REV019	CODE 0420	
N	4	03	38	003	102	REV019	CODE 0420	3001-3225
N	4	03	38	004	102	REV019	CODE 0420	
N	4	03	38	005	102	REV019	CODE 0420	3001-3225
N	4	03	38	006	102	REV019	CODE 0420	
N	4	03	38	007	102	REV019	CODE 0420	3001-3225
N	4	03	38	008	102	REV019	CODE 0420	
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N	4	03	38	010	102	REV019	CODE 0420	
N	4	03	38	011	102	REV019	CODE 0420	3001-3225
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	4	03	40	002	001	REV011	CODE 0055	
	4	03	40	001	001	REV006		1304-3225
	4	03	40	002	100	REV016	CODE 0403	
	4	03	40	003	001	REV011		0990-2894
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	4	03	40	010	001	REV011		
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R	4	04	00	001	001	REV019	CODE 0055	0990
R	4	04	00	001	110	REV019	31896=31897	1304-2321
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	4	04	10	001	001	REV006	CODE 0055	0990
	4	04	10	002	001	REV006	CODE 0055	
	4	04	10	003	001	REV006	CODE 0055	0990
	4	04	10	004	001	REV006	CODE 0055	
	4	04	10	005	001	REV006	CODE 0055	0990
	4	04	10	006	001	REV006	CODE 0055	
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	4	04	10	008	001	REV006	CODE 0055	
	4	04	10	009	001	REV006	CODE 0055	0990
	4	04	10	010	001	REV006	CODE 0055	
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	4	04	10	012	001	REV017	CODE 0055	
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	4	04	10	014	001	REV014	CODE 0055	
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	4	04	10	019	001	REV006	CODE 0055	0990
	4	04	10	020	001	REV006	CODE 0055	
	4	04	10	021	001	REV014	CODE 0055	0990
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	4	04	10	026	001	REV007	CODE 0055	
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4		04	15	016	100	REV012	CODE 0178	
4		04	15	017	100	REV012	CODE 0178	1304-2894
4		04	15	018	100	REV012	CODE 0401	
4		04	15	019	100	REV017	CODE 0401	1304-2894
4		04	15	020	100	REV017	CODE 0401	
4		04	15	021	100	REV017	CODE 0401	1304-2894
4		04	15	022	100	REV017	CODE 0401	
4		04	15	023	100	REV012	CODE 0401	1304-2894
4		04	15	024	100	REV012	CODE 0401	
4		04	15	025	100	REV017	CODE 0401	1304-2894
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4		04	15	033	100	REV012	CODE 0401	1304-2894
4		04	15	034	100	REV012	CODE 0401	
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4		04	15	036	100	REV016	CODE 0401	

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	4	04	15	040	100	REV012	CODE 0401	
	4	04	15	041	100	REV012	CODE 0401	1304-2894
	4	04	15	042	100	REV013	CODE 0401	
	4	04	15	043	100	REV012	CODE 0401	1304-2894
N	4	04	18	001	110	REV019	CODE 0187	3001-3225
N	4	04	18	002	100	REV014	MOD:32401=32402=32475=32929	
N	4	04	18	003	110	REV019	CODE 0402	3001-3225
N	4	04	18	003A	110	REV019	CODE 0187	3001-3225
N	4	04	18	003B	110	REV019	CODE 0187	3001-3225
N	4	04	18	004	110	REV019	CODE 0187	3001-3225
	4	04	18	005	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	04	18	006	100	REV014	MOD:32401=32402=32475=32929	
	4	04	18	007	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	04	18	008	100	REV015	MOD:32401=32402=32475=32929	
	4	04	18	009	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	04	18	010	100	REV014	MOD:32401=32402=32475=32929	
N	4	04	18	011	110	REV019	CODE 0187	3001-3225
N	4	04	18	012	230	REV018	CODE 0034	
N	4	04	18	013	100	REV017	M:32401=32402=32475=32929	3001-3225
N	4	04	18	014	110	REV019	CODE 0187	
	4	04	18	015	100	REV017	32401=32402=32475=32929	3001-3225
	4	04	18	016	100	REV017	32401=32402=32475=32929	
	4	04	18	017	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	04	18	018	100	REV014	MOD:32401=32402=32475=32929	
N	4	04	18	019	110	REV019	CODE 0187	3001-3225
N	4	04	18	020	110	REV019	CODE 0187	
	4	04	18	021	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	04	18	022	100	REV014	MOD:32401=32402=32475=32929	
N	4	04	18	023	110	REV019	CODE 0187	3001-3225
N	4	04	18	024	110	REV019	CODE 0187	
	4	04	18	025	100	REV017	32401=32402=32475=32929	3001-3225
	4	04	18	026	100	REV014	MOD:32401=32402=32475=32929	
N	4	04	18	027	110	REV019	CODE 0187	3001-3225
N	4	04	18	028	100	REV015	MOD:32401=32402=32475=32929	

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	4	04	18	031	100	REV015	MOD:32401=32402=32475=32929	3001-3225
	4	04	18	032	100	REV014	MOD:32401=32402=32475=32929	
	4	04	18	033	100	REV015	MOD:32401=32402=32475=32929	3001-3225
	4	04	18	034	100	REV014	MOD:32401=32402=32475=32929	
	4	04	18	035	100	REV014	MOD:32401=32402=32475=32929	3001-3225
	4	04	18	036	100	REV014	MOD:32401=32402=32475=32929	
N	4	04	18	037	100	REV014	MOD:32401=32402=32475=32929	3001-3225
N	4	04	18	038	115	REV019	CODE 0189	
N	4	04	18	039	115	REV019	CODE 0189	3001-3225
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N	4	04	18	041	115	REV019	CODE 0189	3001-3225
N	4	04	18	042	110	REV019	CODE 0187	
N	4	04	18	043	110	REV019	CODE 0187	3001-3225
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	4	04	20	006	100	REV011	CODE:0056	
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	4	04	25	002	100	REV017	CODE 0178	
	4	04	25	003	100	REV012	CODE 0178	1304-2894
	4	04	25	004	100	REV012	CODE 0178	
	4	04	25	005	100	REV012	CODE 0178	1304-2894
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	4	04	25	008	100	REV012	CODE 0178	
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	4	04	25	010	100	REV012	CODE 0327	
	4	04	25	011	100	REV012	CODE 0178	1304-2894
	4	04	25	012	100	REV012	CODE 0178	
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N	4	04	28	002	110	REV019	CODE 0402	
N	4	04	28	002A	110	REV019	CODE 0402	3001-3225

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N	4	04	28	004	110	REV019	CODE 0402	3001-3225
N	4	04	28	005	110	REV019	CODE 0402	3001-3225
N	4	04	28	006	110	REV019	CODE 0402	
N	4	04	28	006A	110	REV019	CODE 0402	3001-3225
N	4	04	28	007	110	REV019	CODE 0402	3001-3225
N	4	04	28	008	110	REV019	CODE 0402	
N	4	04	28	009	110	REV019	CODE 0402	3001-3225
N	4	04	28	010	110	REV019	CODE 0402	
N	4	04	28	011	110	REV019	CODE 0402	3001-3225
	4	04	30	001	001	REV006		0990-2894
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	4	04	30	001	001	REV006		3001-3225
	4	04	30	002	120	REV014	CODE 0144	
	4	04	30	003	001	REV014		ALL
	4	04	30	004	001	REV006		
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	4	04	30	006	001	REV006	CODE 0055	
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	4	04	30	006	110	REV014	CODE 0178	
	4	04	30	005	120	REV014	CODE 0144	3001-3225
	4	04	30	006	130	REV018	CODE 0354	
	4	04	30	006A	130	REV018	MOD 34313 = 34809	3001-3225
	4	04	30	006B	130	REV018	MOD 34313 = 34809	3001-3225
	4	04	30	007	001	REV006	CODE 0337	0990
	4	04	30	008	001	REV006	CODE 0153	
	4	04	30	007	001	REV006	CODE 0337	3001-3225
	4	04	30	008	130	REV018	CODE 0338	
	4	04	30	007	110	REV014	CODE 0178	1304-2894
	4	04	30	008	110	REV017	CODE 0178	
	4	04	30	009	001	REV006	CODE 0055	0990
	4	04	30	009	110	REV014	CODE 0178	1304-2894
	4	04	30	009	130	REV018	CODE 0339	3001-3225
	4	04	30	009A	130	REV018	CODE 0339	3001-3225
R	4	04	30	010	001	REV019	CODE 0055	0990

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	4	04	30	010A	120	REV018	CODE 0111	3001-3225
	4	04	30	011	001	REV010		0990-2894
	4	04	30	012	001	REV006		
	4	04	30	011	120	REV014	CODE 0144	3001-3225
	4	04	30	012	120	REV014	CODE 0144	
	4	04	30	013	100	REV018	M:23742	ALL
	4	04	30	014	200	REV018	M:23742+26497	
R	4	04	30	015	001	REV011		0990-2894
R	4	04	30	016	100	REV019	M:26497	
R	4	04	30	015	001	REV011		3001-3225
R	4	04	30	016	130	REV019	MOD 34313 + 34809	
	4	04	30	017	001	REV014	CODE 0055	0990
	4	04	30	018	001	REV014	CODE 0055	
	4	04	30	017	110	REV014	CODE 0178	1304-2894
	4	04	30	018	001	REV014	CODE 0055	
	4	04	30	017	130	REV018	CODE 0339	3001-3225
	4	04	30	018	001	REV014	CODE 0055	
	4	04	30	019	001	REV006	CODE 0055	0990
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	4	04	30	021	110	REV014	CODE 0178	1304-2894
	4	04	30	022	110	REV014	CODE 0178	
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	4	04	30	023	130	REV018	CODE 0338	3001-3225
	4	04	30	024	130	REV018	CODE 0338	
	4	04	30	025	110	REV014	CODE 0178	1304-2894
	4	04	30	026	110	REV014	CODE 0369	
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	4	04	30	030	110	REV016	CODE 0178	
	4	04	30	029	130	REV018	CODE 0338	3001-3225
	4	04	30	030	130	REV018	CODE 0338	
	4	04	30	031	110	REV014	CODE 0178	1304-2894
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	4	04	30	036	110	REV014	CODE 0178	
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	4	04	30	036	130	REV018	CODE 0338	
	4	04	30	037	110	REV014	CODE 0178	1304-2894
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N	4	04	32	001	100	REV019	M:35891	2572-2894
N	4	04	32	002	100	REV019	M:35891	
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N	4	04	32	004	100	REV019	M:35891	
N	4	04	32	005	100	REV019	M:35891	2572-2894
N	4	04	32	006	100	REV019	M:35891	
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N	4	04	32	008	100	REV019	M:35891	
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R	4	04	40	001	100	REV017	CODE 0197	1304-2894
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N	4	04	40	002	204	REV019	CODE 0436	
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	4	04	40	004	200	REV017	CODE 0439	

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	4	04	50	001	205	REV017	CODE 0443	1304-2894
	4	04	50	002	100	REV017	25381	
N	4	04	50	001	206	REV019	CODE 0442	3001-3225
N	4	04	50	002	204	REV019	CODE 0445	
N	4	04	50	003	100	REV019	25381	1304-2894
N	4	04	50	004	205	REV019	CODE 0104	
N	4	04	50	003	200	REV019	M:25381+34313=25381+34809	3001-3225
N	4	04	50	004	210	REV019	CODE 0447	
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N	4	04	50	006	205	REV019	M:31896+25381=25381+31897	
N	4	04	50	005	200	REV019	M:25381+34313=25381+34809	3001-3225
N	4	04	50	006	210	REV019	CODE 0448	
R	4	04	50	007	100	REV019	25381	1304-2894
N	4	04	50	007	200	REV019	M:25381+34313=25381+34809	3001-3225
R	4	05	00	001	001	REV018		0990
R	4	05	00	002	001	REV019	STD=25863+28551	
R	4	05	00	001	001	REV018		1304-3225
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	4	05	10	001	001	REV006	CODE 0055	0990
	4	05	10	002	001	REV006	CODE 0055	
	4	05	10	001	110	REV014	CODE 0178	1304-2894
	4	05	10	002	110	REV014	CODE 0178	
	4	05	10	001	120	REV014	CODE 0144	3001-3225
	4	05	10	002	120	REV014	CODE 0144	
	4	05	10	003	001	REV015	CODE 0158	0990-2894
	4	05	10	004	100	REV006	CODE 0056	
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	4	05	10	005	130	REV018	CODE 0346	3001-3225
	4	05	10	006	001	REV006		
	4	05	10	007	100	REV006	CODE 0056	0990
	4	05	10	008	100	REV006	CODE 0056	
	4	05	10	007	105	REV018	CODE 0183	3001-3225
	4	05	10	008	105	REV018	CODE 0183	
	4	05	10	007	110	REV014	CODE 0184	1304-2894
	4	05	10	008	110	REV014	CODE 0184	
	4	05	10	009	001	REV006		0990
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	4	05	10	009	001	REV006		1304-2894
	4	05	10	010	110	REV014	CODE 0184	
	4	05	10	011	001	REV006		0990
	4	05	10	012	001	REV006	CODE 0055	
	4	05	10	011	001	REV006		3001-3225
	4	05	10	012	105	REV018	CODE 0351	
	4	05	10	011	001	REV006		1304-2894
	4	05	10	012	110	REV014	CODE 0178	
	4	05	10	013	001	REV006		0990
	4	05	10	014	001	REV014	CODE 0055	
	4	05	10	013	001	REV006		3001-3225
	4	05	10	014	105	REV018	CODE 0351	
	4	05	10	013	001	REV006		1304-2894
	4	05	10	014	110	REV014	CODE 0178	
	4	05	10	015	001	REV011		0990
	4	05	10	016	001	REV006	CODE 0273	
	4	05	10	015	001	REV011		3001-3225
	4	05	10	016	106	REV018	CODE 0352	
	4	05	10	015	001	REV011		1304-2894
	4	05	10	016	110	REV017	CODE 0395	
	4	05	10	017	001	REV017	CODE 0307	0990
	4	05	10	017	105	REV018	CODE 0351	3001-3225
	4	05	10	017	110	REV017	CODE 0178	1304-2894

M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
4	05	10		017A	110	REV017	CODE 0178	1304-2894
4	05	10		017A	130	REV018	MOD 34313 + 34809	3001-3225
4	05	10		018	001	REV017	CODE 0292	0990
4	05	10		018	105	REV018	CODE 0351	3001-3225
4	05	10		018	110	REV014	CODE 0398	1304-2894
4	05	10		019	001	REV011		ALL
4	05	10		020	001	REV015		
4	05	10		021	100	REV014	CODE 0058	0990
4	05	10		022	100	REV014	CODE 0058	
4	05	10		021	110	REV014	CODE 0399	1304-2894
4	05	10		022	110	REV014	CODE 0399	
4	05	10		021	120	REV015	CODE:0156	3001-3225
4	05	10		022	120	REV014	CODE:0156	
4	05	10		023	001	REV011		ALL
4	05	15		001	001	REV007	CODE 0055	0990
4	05	15		002	001	REV006		
4	05	15		001	105	REV018	CODE 0351	3001-3225
4	05	15		002	130	REV018	MOD 34313 + 34809	
4	05	15		001	110	REV014	CODE 0377	1304-2894
4	05	15		002	001	REV006		
4	05	20		001	115	REV018	CODE 0353	3001-3225
4	05	20		002	100	REV007	M:24035 OR 24189	
4	05	20		001	200	REV006	M:(23742+24035)+(23742+24189	0990-2894
4	05	20		002	100	REV007	M:24035 OR 24189	
4	05	30		001	120	REV006	CODE 0151	ALL
4	05	30		002	120	REV006	CODE 0151	
4	05	30		003	100	REV007	M:24035 OR 24160 OR 24211	ALL
4	05	30		004	100	REV007	M:24035 OR 24160 OR 24211	
4	05	30		005	120	REV007	CODE 0151	ALL
4	05	30		006	001	REV014		
4	05	30		007	001	REV016	STD OR M:(26358+30980)+ (276	0990
4	05	30		007	103	REV016	M:(26358)+(26358+27620+33497	1304-2321
4	05	30		007	200	REV016	M:26358+27620	2572-3225
4	05	40		001	001	REV014	CODE 0055	0990
4	05	40		002	100	REV006	M:24035 OR 24160 OR 24211	
4	05	40		001	110	REV014	CODE 0377	1304-2894
4	05	40		002	100	REV006	M:24035 OR 24160 OR 24211	

M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
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	4	05	40	001	120	REV014	CODE 0144	3001-3225
	4	05	40	002	100	REV006	M:24035 OR 24160 OR 24211	
	4	05	40	003	100	REV006	M:24035 OR 24160 OR 24211	ALL
	4	05	40	004	100	REV006	M:24035 OR 24160 OR 24211	
	4	05	40	005	001	REV006		ALL
	4	05	40	006	100	REV006	M:24035 OR 24160 OR 24211	
	4	05	40	007	100	REV006	M:24035 OR 24160 OR 24211	0990
	4	05	40	008	001	REV007	CODE 0055	
	4	05	40	007	100	REV006	M:24035 OR 24160 OR 24211	3001-3225
	4	05	40	008	105	REV018	CODE 0351	
	4	05	40	007	100	REV006	M:24035 OR 24160 OR 24211	1304-2894
	4	05	40	008	110	REV014	CODE 0377	
	4	05	50	001	001	REV017		ALL
	4	05	50	002	001	REV006		
	4	05	50	003	100	REV014	CODE:0101	0990
	4	05	50	004	001	REV006		
	4	05	50	003	210	REV014	CODE 0378	1304-2894
	4	05	50	004	001	REV006		
	4	05	50	003	220	REV014	CODE 0275	3001-3225
	4	05	50	004	130	REV018	MOD 34313 = 34809	
	4	05	50	004A	130	REV018	MOD 34313 = 34809	3001-3225
	4	05	50	005	001	REV017	CODE 0055	0990
	4	05	50	006	001	REV017	CODE 0055	
	4	05	50	005	100	REV017	CODE 0377	1304-2894
	4	05	50	006	110	REV017	CODE 0377	
	4	05	50	005	115	REV018	CODE 0354	3001-3225
	4	05	50	006	130	REV018	CODE 0354	
	4	05	50	007	001	REV011		0990-2894
	4	05	50	008	001	REV006		
N	4	05	50	007	001	REV011		3001-3225
N	4	05	50	008	103	REV019	CODE 0380	
	4	05	50	009	001	REV006		0990
	4	05	50	010	001	REV007	CODE 0055	
	4	05	50	009	001	REV006		1304-2894
	4	05	50	010	110	REV014	CODE 0377	
	4	05	50	009	130	REV018	CODE 0354	3001-3225
	4	05	50	010	120	REV014	CODE 0144	
	4	05	50	011	100	REV015	CODE 0056	0990
	4	05	50	012	001	REV007	CODE 0055	

M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
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	4	05	50	011	110	REV014	CODE 0377	1304-2894
	4	05	50	012	110	REV014	CODE 0381	
	4	05	50	011	120	REV014	CODE 0144	3001-3225
	4	05	50	012	130	REV018	CODE 0354	
	4	05	50	013	001	REV006		0990
	4	05	50	014	001	REV018	CODE 0321	
	4	05	50	013	001	REV006		1304-2894
	4	05	50	014	100	REV018	CODE 0383	
	4	05	50	013	130	REV018	MOD 34313 + 34809	3001-3225
	4	05	50	014	100	REV018	CODE 0383	
	4	05	60	001	001	REV010		0990-2321
	4	05	60	002	100	REV006	M:24035 OR 24160 OR 24211	
	4	05	60	001	001	REV010		2572-3225
	4	05	60	002	200	REV015	CODE 0134	
	4	05	60	003	100	REV006	CODE 0253	0990
	4	05	60	004	100	REV006	CODE 0058	
	4	05	60	003	100	REV006	CODE 0253	1304-2321
	4	05	60	004	110	REV014	CODE 0385	
	4	05	60	003	200	REV015	CODE 0134	2572-2894
	4	05	60	004	300	REV015	CODE 0201	
N	4	05	60	003	200	REV015	CODE 0134	3001-3225
N	4	05	60	004	403	REV019	CODE 0384	
	4	05	60	005	001	REV015	CODE 0203	0990
	4	05	60	006	100	REV016	CODE : 0241	
	4	05	60	005	100	REV018	CODE 0388	1304-2321
	4	05	60	006	100	REV016	CODE : 0241	
	4	05	60	005	200	REV018	CODE 0138	2572-3225
	4	05	60	006	100	REV016	CODE : 0241	
	4	05	60	007	001	REV011		0990
	4	05	60	008	001	REV015	CODE 0055	
	4	05	60	007	001	REV011		1304-2894
	4	05	60	008	110	REV015	CODE 0377	
	4	05	60	007	001	REV011		3001-3225
	4	05	60	008	115	REV018	CODE 0389	
	4	05	60	009	001	REV015		ALL
	4	05	60	010	001	REV010		
	4	05	70	001	001	REV014	CODE 0055	0990
	4	05	70	002	001	REV006		
	4	05	70	001	110	REV014	CODE 0388	1304-3225
	4	05	70	002	001	REV006		

M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
	4	05	70	003	001	REV006		0990
	4	05	70	004	001	REV011	STD = 32332 = 32333 = 33591	
	4	05	70	003	001	REV006		1304-3225
	4	05	70	004	100	REV018	CODE 0035	
	4	05	70	005	001	REV006		ALL
	4	05	70	006	110	REV006	M:24035=24160=(24189+24211)	
	4	05	70	007	110	REV008	M: 26497	ALL
	4	05	70	008	001	REV017		
	4	05	70	009	001	REV017	CODE 0055	0990
	4	05	70	010	001	REV017		
	4	05	70	009	110	REV014	CODE 0400	1304-3225
	4	05	70	010	001	REV017		
R	4	05	70	011	001	REV019	CODE 0257	0990-2321
R	4	05	70	012	001	REV019		
R	4	05	70	011	200	REV019	30368+31283	2572-3225
R	4	05	70	012	001	REV019		
R	4	05	70	013	001	REV019		ALL
R	4	05	70	013A	001	REV019		ALL
	4	05	70	014	001	REV007		ALL
	4	05	70	015	001	REV014	CODE 0055	0990
	4	05	70	016	001	REV011		
	4	05	70	015	110	REV013	CODE 0421	1304-3225
	4	05	70	016	001	REV011		
	4	05	70	017	001	REV011		ALL
	4	05	70	018	001	REV017		
	4	05	70	019	001	REV011		0990
	4	05	70	020	001	REV006	STD OR M:(26358+30980)	
	4	05	70	019	001	REV011		1304-2321
	4	05	70	020	100	REV015	M:(26358)=(26358+27620+33497	
	4	05	70	019	001	REV011		2572-3225
	4	05	70	020	200	REV015	M:26358+27620	
	4	05	70	021	001	REV006		ALL
	4	05	70	022	100	REV015	CODE 0215	
	4	05	70	022A	001	REV015		ALL
	4	05	70	023	100	REV011	M:24035=24160=24211	ALL
	4	05	70	024	100	REV008	M:24035=24160=24211	
R	4	05	70	025	100	REV008	M:24035=24160=24211	3001-3225
R	4	05	70	026	001	REV019		

M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
R	4	05	70	025	200	REV009	CODE:0016	0990-2894
R	4	05	70	026	001	REV019		
R	4	05	70	027	001	REV014		ALL
R	4	05	70	028	100	REV019	M:24035=24160=24211	
	4	05	70	029	001	REV006		ALL
	4	05	70	030	001	REV006		
	4	05	80	001	100	REV017	M:26497	ALL
	4	05	80	001A	102	REV017	CODE 0250	0990-2894
	4	05	80	001A	201	REV017	CODE 0278	3001-3225
	4	05	80	002	100	REV011	CODE 0171	0990
N	4	05	80	002	307	REV019	CODE 0423	3001-3225
	4	05	80	002	310	REV015	CODE 0313	1304-2894
	4	05	80	003	100	REV011	CODE 0012	0990
	4	05	80	004	001	REV015	STD=(25863+28551)	
	4	05	80	003	110	REV007	CODE 0310	1304-3225
	4	05	80	004	100	REV015	CODE 0310	
R	4	05	80	005	100	REV019	M:(24035=24160=24211)	ALL
R	4	06	00	001	001	REV019	CODE:0055	0990
	4	06	00	001	110	REV014	CODE 0424	1304-2894
R	4	06	00	001	115	REV019	CODE 0354	3001-3225
	4	06	10	001	001	REV012		0990-2894
	4	06	10	002	001	REV012		
	4	06	10	001	100	REV016	CODE 0231	3001-3225
	4	06	10	002	100	REV016	CODE 0231	
	4	06	20	001	001	REV006		0990-2894
	4	06	20	002	001	REV013		
	4	06	20	001	130	REV018	MOD 34313 = 34809	3001-3225
	4	06	20	002	130	REV018	MOD 34313 = 34809	
	4	06	20	003	001	REV016	CODE 0425	0990-2894
	4	06	20	003	115	REV018	CODE 0354	3001-3225
	4	06	20	003A	001	REV018		0990-2894
	4	06	20	003A	130	REV018	MOD 34313 = 34809	3001-3225
	4	06	20	004	001	REV018		ALL
R	4	06	20	005	001	REV016		0990
R	4	06	20	006	100	REV019	24588=24588+31897+32333	

M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
M	V	CH	SEC	---PAGE--	SEQ-	--REV--	----VALIDATION CRITERIA-----	-----EFFECTIVITY-----
R	4	06	20	005	001	REV016		1304-2894
R	4	06	20	006	110	REV019	CODE 0427	
R	4	06	20	005	100	REV017	CODE 0231	3001-3225
R	4	06	20	006	110	REV019	CODE 0427	
R	4	06	20	007	001	REV014	CODE 0140	0990
R	4	06	20	008	001	REV019	CODE:0055	
	4	06	20	007	001	REV014	CODE 0140	1304-2894
	4	06	20	008	100	REV014	CODE 0428	
	4	06	20	007	001	REV014	CODE 0140	3001-3225
	4	06	20	008	110	REV016	CODE 0232	
	4	06	30	001	110	REV014	CODE 0429	1304-2894
	4	06	30	002	110	REV012	CODE 0430	
	4	06	30	001	120	REV014	CODE 0166	3001-3225
	4	06	30	002	110	REV012	CODE 0430	
	4	06	40	001	001	REV012		ALL
	4	06	40	002	001	REV016		
	4	07	00	001	001	REV006	CODE 0055	0990
	4	07	00	001	100	REV012	CODE 0178	1304-2894
	4	07	00	001	120	REV014	CODE 0267	3001-3225
	4	07	10	001	001	REV011	CODE 0055	0990
	4	07	10	002	001	REV011	CODE 0055	
	4	07	10	003	001	REV011	CODE 0055	0990
	4	07	10	004	001	REV008	CODE 0055	
	4	07	10	005	001	REV011	CODE 0055	0990
	4	07	10	006	001	REV011	CODE 0055	
	4	07	10	007	001	REV011	CODE 0055	0990
	4	07	10	008	001	REV011	CODE 0055	
	4	07	10	009	001	REV011	CODE 0055	0990
	4	07	10	010	001	REV006	CODE 0055	
	4	07	10	011	001	REV018	CODE 0055	0990
	4	07	10	012	001	REV011	CODE 0055	
	4	07	10	013	001	REV011	CODE 0055	0990
	4	07	10	014	001	REV006	CODE 0055	
	4	07	10	015	001	REV006	CODE 0055	0990
	4	07	15	001	100	REV012	CODE 0178	1304-2894
	4	07	15	002	100	REV012	CODE 0178	
	4	07	15	003	100	REV012	CODE 0178	1304-2894
	4	07	15	004	100	REV012	CODE 0178	

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	4	07	15	006	100	REV012	CODE 0178	
	4	07	15	007	100	REV012	CODE 0178	1304-2894
	4	07	15	008	100	REV012	CODE 0178	
	4	07	15	009	100	REV012	CODE 0178	1304-2894
	4	07	15	010	100	REV012	CODE 0178	
	4	07	15	011	100	REV012	CODE 0178	1304-2894
	4	07	15	012	100	REV012	CODE 0178	
	4	07	15	013	100	REV012	CODE 0178	1304-2894
	4	07	15	014	100	REV012	CODE 0178	
	4	07	15	015	100	REV012	CODE 0178	1304-2894
N	4	07	18	001	100	REV014	CODE 0144	3001-3225
N	4	07	18	002	105	REV019	CODE 0431	
N	4	07	18	003	105	REV019	CODE 0431	3001-3225
N	4	07	18	004	100	REV014	CODE 0144	
N	4	07	18	005	105	REV019	CODE 0431	3001-3225
N	4	07	18	006	105	REV019	CODE 0431	
N	4	07	18	007	100	REV014	CODE 0144	3001-3225
N	4	07	18	008	105	REV019	CODE 0431	
N	4	07	18	009	105	REV019	CODE 0431	3001-3225
N	4	07	18	010	100	REV014	CODE 0144	
N	4	07	18	011	105	REV019	CODE 0431	3001-3225
N	4	07	18	012	105	REV019	CODE 0431	
N	4	07	18	013	105	REV019	CODE 0431	3001-3225
N	4	07	18	014	105	REV019	CODE 0431	
N	4	07	18	015	105	REV019	CODE 0431	3001-3225

M V T	REV	MOD SB	MP	TITLE / VALIDITY
.	009A	23353	.....	AUTO FLIGHT - FMS - PROVIDE FMS CROSS LOAD
	.....			CC-COC CC-COD CC-COE
				CC-COF CC-COG CC-COH
				CC-COI CC-COK CC-COL
				CC-COM LV-BET LV-BFY
				LV-BFO CC-COT CC-COU
				CC-COX CC-COY CC-COZ
				CC-CPE CC-CPF CC-CPI
				CC-CPJ CC-CPL CC-CPM
				CC-CPO CC-CPQ CC-CPX
				CC-CQK CC-CQL CC-CVA
				CC-CVB CC-CVF MSN 3214
				MSN 3216 MSN 3220 MSN 3225
.	014	23593	.....	AUTO FLIGHT - MCDU 1 AND 2 - SOFTWARE UPGRADED (CI-20)
	.....			ALL
.	009A	23742	.....	AUTO FLIGHT - FCU - INTRODUCE FCU
	.....			STANDARD M10
				ALL
.	009A	24035	.....	INDICATING/RECORDING SYSTEMS -
	.....			GENERAL- DEFINE CPIP3
				ALL
.	009A	24066	.....	AUTO FLIGHT - FMS - INTRODUCE FMGC
	.....			A320/321 B1 STD WITH OPTIONS AND 400 KILOWORDS FOR IAE V2500 VERSIONS
				CC-CZB CC-COC CC-COD
				CC-COE CC-COF CC-COG
				CC-COH CC-COI CC-COK
				CC-COL CC-COM LV-BET
				LV-BFY LV-BFO CC-COT
				CC-COU CC-COX CC-COY
				CC-COZ CC-CPE CC-CPF
				CC-CPI CC-CPJ CC-CPL
				CC-CPM CC-CPO CC-CPQ
				CC-CPX CC-CQK CC-CQL

M V T	REV	MOD SB	MP	TITLE / VALIDITY
.	015	24105	.....	FUSELAGE - REAR FUSELAGE - ADAPT SECTION 17/19 STRUCTURE TO A319 DEFINITION CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	009A	24309	.....	AUTO FLIGHT - FMGC - PROVIDE TIME CONSTRAINT AND TEN CHARACTERS RTE IDENT FUNCTIONS ALL
.	018	24588	.....	AUTO FLIGHT-FAC-INTRODUCE FAC P/N BAM 510 ALL
.	014	25204	.....	NAVIGATION-ADIRS-INSTALL HONEYWELL ADIRS WITH GPS PRIMARY NAVIGATION CAPABILITY CC-COC CC-COD CC-COE CC-COF CC-COG CC-COH CC-COI CC-COK CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	009A	25225	.....	AUTO FLIGHT-FMGC-REDUCE VAPP FOR A320 CFM/IAE CC-COC CC-COD CC-COE CC-COF CC-COG CC-COH CC-COI CC-COK CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT

M V T	REV	MOD SB	MP	TITLE / VALIDITY
.	015	25294	.....	NAVIGATION - ADIRS - INSTALL HONEYWELL ADIRS CAPABLE OF A319 A/C
		.....		CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL
.	009A	25295	.....	AUTOFLIGHT - FMGC - ACTIVATE ACARS INTERFACE IN FMS (CFM AND IAE ENGINES)
		.....		CC-COC CC-COD CC-COE CC-COF CC-COG CC-COH CC-COI CC-COK CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	009A	25345	.....	AUTOFLIGHT-FCU-INTRODUCE F.C.U. STANDARD M11
		.....		ALL
.	009A	25381	.....	AUTOFLIGHT - FMGC - ACTIVATE PRINTER INTERFACE IN FMS (CFM AND IAE ENGINES)
		.....		CC-COC CC-COD CC-COE CC-COF CC-COG CC-COH CC-COI CC-COK CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225

M V T	REV	MOD SB	MP	TITLE	VALIDITY
.	009A	25863	.....	AUTO FLIGHT - FCU - DEFINE FLIGHT DIRECTOR ENGAGEMENT IN CROSSED BARS AT GO AROUND	CC-COC CC-COD CC-COE CC-COF CC-COG CC-COH CC-COI CC-COK CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	015	26358	.....	AUTOFLIGHT-FLIGHT CONTROL UNIT-(FCU) INTRODUCE SEXTANT MODULAR FCU	CC-COC CC-COD CC-COE CC-COF CC-COG CC-COH CC-COI CC-COK CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	009A	26497	.....	AUTO FLIGHT-GENERAL-ACTIVATE GLOBAL SPEED PROTECTION AND F/D DISENGAGEMENT UPON SPEED CONSTRAINTS	ALL

M V T	REV	MOD SB	MP	TITLE / VALIDITY
.	009A	26999	.....	NAVIGATION - MMR - INSTALL COLLINS MMR PROVIDING ILS AND GPS FUNCTION
	.....			CC-COC CC-COD CC-COE
				CC-COF CC-COG CC-COH
				CC-COI CC-COK CC-COL
				CC-COM LV-BET LV-BFY
				LV-BFO CC-COT CC-COU
				CC-COX CC-COY CC-COZ
				CC-CPE CC-CPF CC-CPI
				CC-CPJ CC-CPL CC-CPM
				CC-CPO CC-CPQ CC-CPX
				CC-CQK CC-CQL CC-CVA
				CC-CVB CC-CVF MSN 3214
				MSN 3216 MSN 3220 MSN 3225
.	009A	27256	.....	AUTO FLIGHT - MULTIPURPOSE CONTROL AND DISPLAY UNIT (MCDU) - INTRODUCE MCDU HONEYWELL 2ND GENERATION (P/N -980)
	.....			ALL
.	009A	27522	.....	INFORMATION SYSTEM - AIR TRAFFIC AND INFORMATION SYSTEM (ATIMS) - INSTALL ATSU COMPUTER FOR ACARS
	.....			CC-COC CC-COD CC-COE
				CC-COF CC-COG CC-COH
				CC-COI CC-COK CC-COL
				CC-COM LV-BET LV-BFY
				LV-BFO CC-COT CC-COU
				CC-COX CC-COY CC-COZ
				CC-CPE CC-CPF CC-CPI
				CC-CPJ CC-CPL CC-CPM
				CC-CPO CC-CPQ CC-CPX
				CC-CQK CC-CQL CC-CVA
				CC-CVB CC-CVF MSN 3214
				MSN 3216 MSN 3220 MSN 3225

M V T	REV	MOD SB	MP	TITLE	VALIDITY
.	011	27541	.....	AUTO FLIGHT - MCDU - INSTALL AN MCDU 2ND GENERATION HONEYWELL FMS (MCDU WITH A340 KEYBOARD)	CC-COC CC-COD CC-COE CC-COF CC-COG CC-COH CC-COI CC-COK CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL
.	017	27620	.....	NAVIGATION-STANDBY DATA : ALTITUDE AND HEADING - INSTALL INTEGRATED STANDBY INSTRUMENT SYSTEM (ISIS)	CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	009A	27831	.....	AUTO-FLIGHT-FMGC-IAE ENGINES-INTRODUCE FMGC B546CCM0104 (FA 817 STD) CAPABLE OF GPS/ACARS FUNCTION	CC-CZB CC-COC CC-COD CC-COE CC-COF CC-COG CC-COH CC-COI CC-COK CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL
.	015	28218	.....	NAVIGATION-ADIRS-INTRODUCE LITTON ADIRU 4 MCU STD-312	CC-CZB CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL
		34-1181 04			

M V T	REV	MOD SB	MP	TITLE / VALIDITY
N	019	28284	.....	NAVIGATION-ILS-INSTALL SEXTANT MMR PROVIDING ILS (FM IMMUNE) P/N TLS 755.01.0101B CC-CZB
.	017A	28382 34-1186	.....	NAVIGATION - MMR - ACTIVATE GPS PRIMARY FUNCTION (HYBRID) IN SEXTANT MMR (WITH HONEYWELL OR LITTON ADIRU) CC-CZB
.	014	28829 22-1076 01	.....	AUTO-FLIGHT-MCDU-INTRODUCE HWL MCDU PROTECTED AGAINST BLANKING ALL
.	017	30368	.....	INDICATING RECORDING SYSTEMS- EIS-INSTALL DMC, DU AND DISKETTES FOR EIS2 CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	014	30748	.....	GENERAL-FLIGHT ENVIRONMENTAL ENVELOPE- EXTENSION TO 12100 M (39800 FT) CC-COH CC-COI CC-COK CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225

M V T	REV	MOD SB	MP	TITLE / VALIDITY
.	017	31283 31-1197	.....	INDICATING RECORDING SYSTEM-FWC- INTRODUCE FWC STANDARD H2 F1 LV-BFO CC-COT CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	012	31364	.....	AUTO-FLIGHT-FMGC-INSTALL FMGC P/N B546CCM0105 (IAE/GPS/ACARS) CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL
.	013	31897 22-1090 11	.....	AUTOFLIGHT-FMGC-INSTALL FMGC IAE C13042BA01 (EQUIPPED WITH FMS2 HONEYWELL) CC-COC CC-COD CC-COE CC-COF CC-COG CC-COH CC-COI CC-COK CC-COL CC-COM LV-BET LV-BFY LV-BFO CC-COT CC-COU CC-COX CC-COY CC-COZ CC-CPE CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	018A	32401	.....	AUTOFLIGHT - FMGC DEFINE AND INSTALL FMGC IAE C13043BA01 THALES(EQUIPPED WITH FMS2 THALES/SMITH) CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225

M V T	REV	MOD SB	MP	TITLE / VALIDITY
.	018A	34076	.....	AUTO-FLIGHT - FMGC - INSTALL FMGC IAE C13043BA02 (STD S2I9) THALES(EQUIPPED WITH FMS2 THALES/SMITH) CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	018A	34809	.....	AUTO-FLIGHT - FLIGHT MANAGEMENT AND GUIDANCE COMPUTER - INSTALL FMS2 THALES "S3" ASSOCIATED TO FG "I9": IAE ENGINES CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
N	019	35526	.....	AUTOFLIGHT - FMGC - INSTALL FMGC IAE/PW STD P1I10 (WITH FMS2 HONEYWELL) ON A/C FITTED WITH IAE OR PW POWERPLANTS CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
.	018A	35538	.....	AUTOFLIGHT-MULTIPURPOSE CONTROL AND DISPLAY UNIT (MCDU) - INSTALL HONEYWELL LCD MCDU CC-CVA CC-CVB CC-CVF MSN 3214 MSN 3216 MSN 3220 MSN 3225
N	019	35891	.....	NAVIGATION - GENERAL - ACTIVATE POLAR NAVIGATION FUNCTION ON A320 FAMILY AIRCRAFT CC-CPF CC-CPI CC-CPJ CC-CPL CC-CPM CC-CPO CC-CPQ CC-CPX CC-CQK CC-CQL

01.00 CONTENTS

01.10 GENERAL

PREAMBLE 1
GENERAL PHILOSOPHY 2
SYSTEM DESCRIPTION 2

PREAMBLE

The Auto Flight System is described in the volume 1 and volume 4.
The volume 1 gives a general description of the system and its functions
- Architecture
- Function description
- Basic principle of systems
  - Reversion
  - Protection
  - Managed and selected guidance modes
- Mode information
- Display characteristics (chapter 1.22 and 1.31)

The volume 4 is devoted to the FMGS operational information
- Operational principles
- Pilot interface (MCDU pages)
- Procedural material including :
  - FMGS procedures on ground and in flight
  - mode annunciation in flight
  - typical flight profiles
- Irregularities
  - Degraded modes of operations
  - FMGS failures and procedures
  - FMGS behaviour following failures of other systems

GENERAL PHILOSOPHY

The Flight Management Guidance System (FMGS) operates as follows :

- During cockpit preparation the crew uses the Multifunction Control and Display Unit (MCDU) to insert a preplanned route from origin to destination. This route includes SID, EN ROUTE, WAYPOINTS, STAR, APPROACH, MISSED APPR, and ALTN route as available from the navigation data base.
- Subsequently the system defines a vertical profile and a speed profile, taking into account ATC requirements and performance criteria.

The FMGS computes the aircraft position continually, using stored aircraft performance data and navigation data. Therefore it can steer the aircraft along a preplanned route and vertical and speed profiles. This type of guidance is said to be “managed”.

If the pilot wants to modify any flight parameter (SPD, V/S, HDG, etc.) temporarily, he may do so by using the various Flight Control Unit (FCU) selectors. The FMGS then guides the aircraft to the target value of this parameter that he has selected. This type of guidance is said to be “selected”.

The two available types of guidance, then, are :

- Managed guidance guides the aircraft along the preplanned route and the vertical and speed/Mach profile. (The FMGS computes the target values of the various flight parameters).
- Selected guidance guides the aircraft to the target values of the various flight parameters the pilot selects by using the FCU selectors.

Selected guidance always has priority over managed guidance.

SYSTEM DESCRIPTION

Please refer to 1.22.10.

02.00 CONTENTS

02.10 INTRODUCTION

02.20 FLIGHT MANAGEMENT PRINCIPLES

NAVIGATION 1
NAVIGATION DATABASE 4a
FLIGHT PLANNING 5
* LATERAL FLIGHT PLANNING 5
* VERTICAL FLIGHT PLANNING 10
PERFORMANCE FUNCTION 14
* FLIGHT OPTIMIZATION 14
* COMPUTATION OF PREDICTIONS 17

02.30 FLIGHT GUIDANCE PRINCIPLES

MANAGED TARGETS 1
SELECTED TARGETS 1
R MODE REVERSIONS 1
FLIGHT GUIDANCE MODES 1
* LATERAL MODES 2
* VERTICAL MODES 3
* CLIMB MODE 4
* SPECIFIC MODES IN CRUISE PHASE 5
* DES MODE 6
* APPROACH MODES 12
FLIGHT MODE ANNUNCIATOR (FMA) 13

INTRODUCTION

The flight management and guidance system (FMGS) performs navigation functions and lateral and vertical flight planning functions. It also computes performance parameters and guides the aircraft along a preplanned route.

Each FMGC is divided into two main parts :

- The Flight Management (FM) part controls the following functions :
  - Navigation
  - Management of flight planning
  - Prediction and optimization of performance
  - Management of navigation radios
  - Management of displays
- The Flight Guidance (FG) part performs the following functions :
  - Autopilot (AP) command
  - Flight director (FD) command
  - Autothrust (A/THR) command

This chapter (4.02) describes the operational principles of flight management and flight guidance in order to help the reader understand how the FMGS functions.

NAVIGATION

Essential navigation functions are described in the volume 1 (1.22.20) but some principles are reemphasized in this chapter due to their operational impact.

POSITION ACCURACY (PROG PAGE)

The HIGH or LOW accuracy is indicated on the PROG page.
This display is the result of the comparison between the estimated position error (EPE) and the position accuracy criteria defined by airworthiness authorities for various flight areas.
The flight crew, when the aircraft is not fitted or not using the GPS primary function, must check the navigation accuracy periodically to confirm the system computation.
When the accuracy changes from low to high (or high to low), both MCDUs and NDs display the message “NAV ACCUR UPGRAD” (or ”NAV ACCUR DOWNGRAD”).

NAVIGATION ACCURACY CHECK

When GPS primary is available, the navigation accuracy check is not required.

When GPS primary is not available, the pilot must perform this essential check :

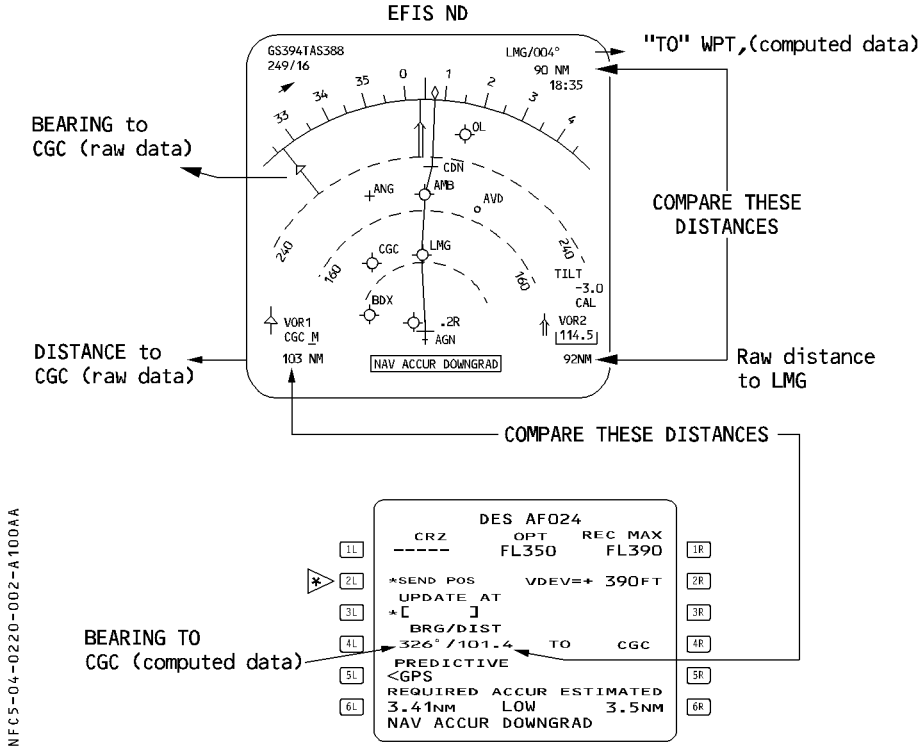
· Periodically in cruise,

R · At 10 000 feet in descent.

R When entering a terminal/approach area, the pilot must monitor navigation accuracy only. The procedure is :

· While en route, check the HIGH/LOW accuracy information.
  – If accuracy is "LOW" (and whenever "NAV ACCUR DOWNGRAD" appears), compare raw data from the tuned navaids with the corresponding FM-computed data on the navigation display or the MCDU PROG page.
  – If accuracy is "HIGH", periodically perform the comparison (about once per hour).

· In descent, and in terminal and approach areas, validate the estimated accuracy, whether it is "HIGH" or "LOW", by comparing the FM data with the raw data from the VOR/DME at the destination airfield, if available.



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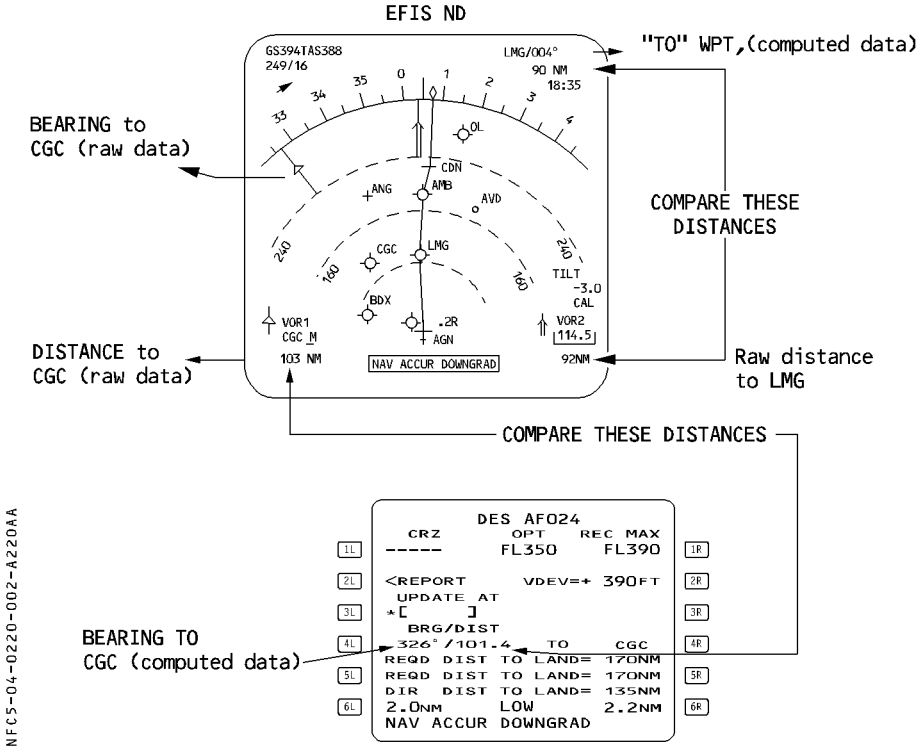
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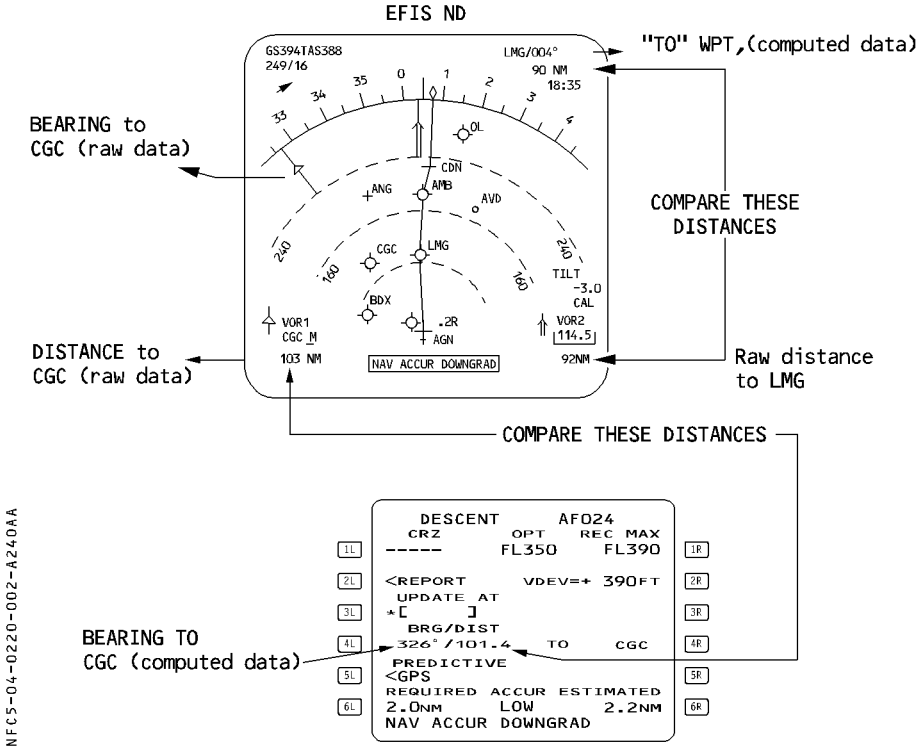
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  – If accuracy is "HIGH", periodically perform the comparison (about once per hour).

· In descent, and in terminal and approach areas, validate the estimated accuracy, whether it is "HIGH" or "LOW", by comparing the FM data with the raw data from the VOR/DME at the destination airfield, if available.



This check verifies and quantifies the FM accuracy. It confirms the reliability of FMGS data itself and of the navigation display presentation. It also validates the use of the NAV mode. By comparing the bearing, the crew may evaluate the validity of the overall check.
In area with high magnetic variation change, this comparison of bearings may not be adequate.

RADIO NAVIGATION TUNING

Each FMGC tunes the navaids it uses for display and computing position.
The FM may tune navaids for display automatically, using an internal logic, or the pilot may tune them manually on the RADIO NAV page.
The FM tunes automatically the DMEs used for position update. It scans them constantly.

NAVAIDS USED FOR DISPLAY

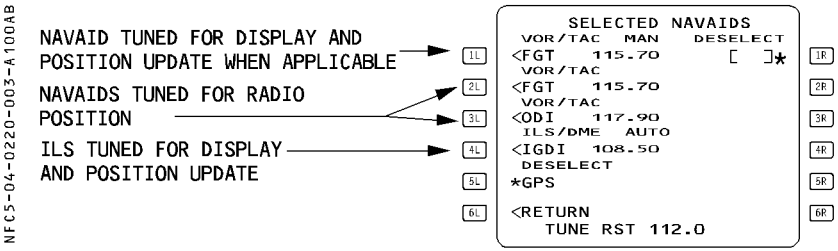
The RADIO NAV page, and the ND show which navaids have been tuned for display.

R *Note : All navaids tuned on the RAD NAV page are used for display purpose.*

NAVAIDS USED FOR POSITION UPDATE

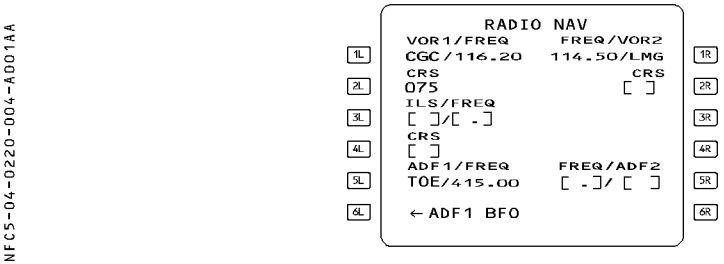
Navaids used for aircraft's position update are displayed on the SELECTED NAVAIDS page.
If a NAVAID is unreliable, the pilot should deselect it manually.

Note : When the FMGC uses the VOR/DME for radio position, it also uses the related VOR/DME for display.
If the crew has selected manually the VOR/DME for display, and if it is not convenient for the FMGC to use it for position update, the FMGC will require the crew to select another VOR/DME. The MCDU will display the message "TUNE BBB FFF.F", BBB is the Navaid identifier and FFF.F the VOR frequency.



MANUAL TUNING

– **WRITE the identifier on the RAD NAV page.**
Preferably use the identifier.



● **If the MCDU displays "NOT IN DATA BASE" :**

– **WRITE the frequency.**

– **DISREGARD the ident that appears in small font on the MCDU.**
When a frequency is entered in the VOR field, the FMGC automatically associates to the tuned frequency the closest navaid identifier with the same frequency, and displays it on the RAD NAV page. This identifier may not correspond to the tuned navaid.
If the closest navaid, found in the database, is of a different type (e.g. VOR instead of VOR/DME), the crew will obtain a partial tuning (e.g. VOR indication instead of VOR/DME indication).

CAUTION

Pilots should use the RMP NAV keys only when both FMGCs or both MCDUs are inoperative. When at least one FMGC is operative, use of the NAV key on the RMP (while the LOC update is active) may freeze the FM position during approach, and must be avoided.

NAVAID IDENTIFICATION

– **CHECK the ILS identifier decoding on the PFD, and the VOR or ADF identifier on the ND.**
When the navaid identifier is decoded in agreement with that published, no audio check is necessary.
When the decoding is different from the published one, check the audio. Due to morse coding inaccuracy, wrong decoding may sometimes occur.

R *Note : When a DME or a TACAN only is selected using either its identifier or its*
R *frequency, the NDs do not display the decoded indication.*

This check verifies and quantifies the FM accuracy. It confirms the reliability of FMGS data itself and of the navigation display presentation. It also validates the use of the NAV mode. By comparing the bearing, the crew may evaluate the validity of the overall check.
In area with high magnetic variation change, this comparison of bearings may not be adequate.

RADIO NAVIGATION TUNING

Each FMGC tunes the navaids it uses for display and computing position.
The FM may tune navaids for display automatically, using an internal logic, or the pilot may tune them manually on the RADIO NAV page.
The FM tunes automatically the DMEs used for position update. It scans them constantly.

NAVAIDS USED FOR DISPLAY

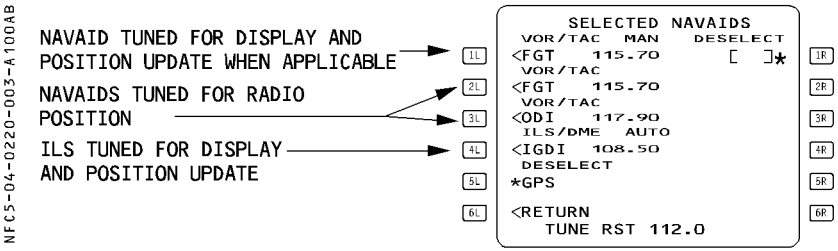
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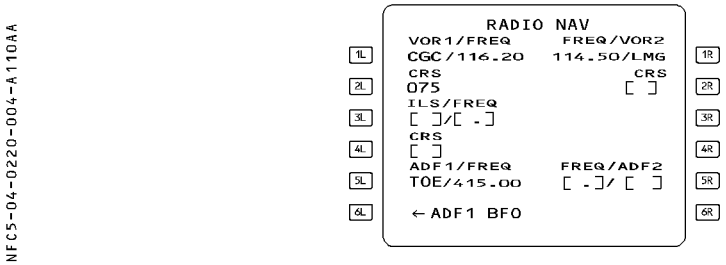
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Preferably use the identifier.



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When a frequency is entered in the VOR field, the FMGC automatically associates the tuned frequency with the closest navaid identifier having the same frequency, and displays it on the RAD NAV page. This identifier may not correspond to the tuned navaid.
If the closest navaid, found in the database, is of a different type (e.g. VOR instead of VOR/DME), the crew will obtain a partial tuning (e.g. VOR indication instead of VOR/DME indication).

NAVAID IDENTIFICATION

– **CHECK the ILS identifier decoding on the PFD, and the VOR or ADF identifier on the ND.**
When the navaid identifier is decoded, in agreement with that published, no audio check is necessary.
When the decoding is different from the published one, check the audio. Due to morse coding inaccuracy, wrong decoding may sometimes occur.

Note : When a DME or a TACAN only is selected, using either its identifier or its frequency, the NDs do not display the decoded indication.

NAVIGATION DATABASE

Overall navigation performance is mainly based on two elements : First, the accuracy of the aircraft position calculation ; and, second, the validity of the flight path definition, as extracted from the navigation database.
The level of validation depends on the type of operations. For example, JAA TGL 10 requires that, for Precision RNAV in terminal area, providers and operators implement a quality assurance program for the navigation database, which may include a navigation database validation process. The highest level of validation is required for RNAV approach, with lateral and vertical navigation.
The navigation databases are revised every 28 days (ARINC cycle).
Flights should be conducted with a navigation database that is within its cycle.
This should be checked on the MCDU AIRCRAFT STATUS PAGE.

R OPERATIONS WITH AN OUTDATED NAVIGATION DATABASE

Airbus recommends flying with an updated navigation database. However, in exceptional circumstances, and for a limited period of time, an aircraft can continue to operate beyond the end data of the database cycle, provided it is approved by the national authorities.
The following precautions need to be considered :

- Prior to flight, identify recent changes on the intended route, with the navigation charts and manuals. Some "strategic" new waypoints, not in the navigation database, may be worth entering as DEFINED WAYPOINT on MCDU.

  Note : Flying with an outdated database, in an airspace that was recently restructured with numerous new waypoints, should be avoided.

- Check SID, STAR, and approach procedures of departure, destination and required alternates for recent changes.
  Do not attempt to modify, or manually construct, terminal instrument procedures or approaches.
- Fly terminal instrument procedures, and approaches with managed guidance, that are in the navigation database and that have been checked for accuracy. Otherwise, fly the procedure, or the approach, in selected guidance with conventional radio navaid raw data.

FLIGHT PLANNING

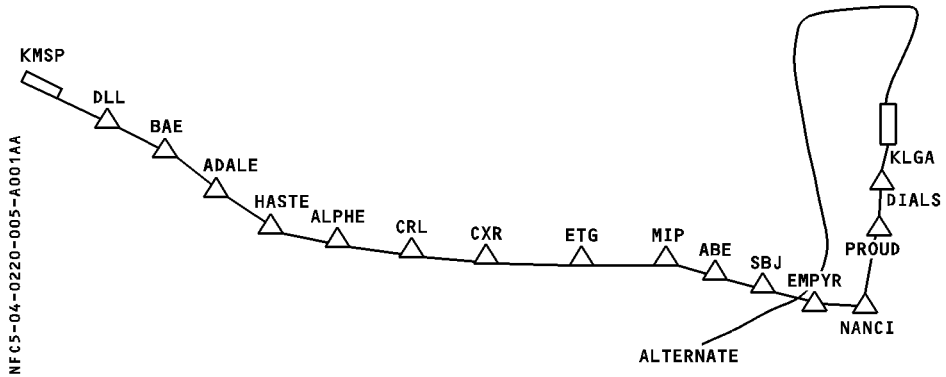
The pilot uses the MCDU to insert flight plans into the FMGS :
- a lateral flight plan that defines the intended horizontal flight path
- a vertical flight plan that defines the intended speed and altitude profile for the aircraft to follow while flying the lateral flight plan.

Note : The flight planning function is available for both the primary and secondary flight plans.

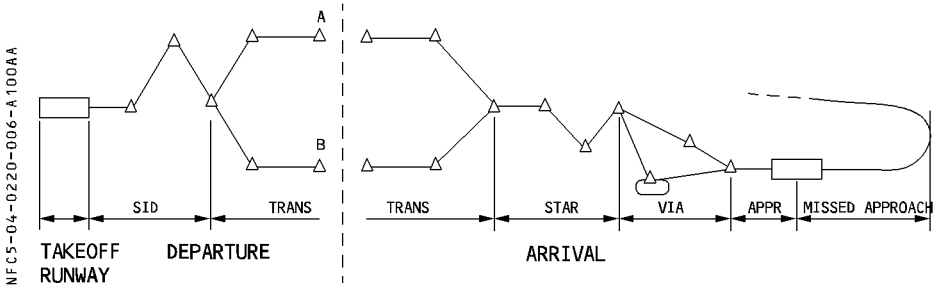
LATERAL FLIGHT PLANNING

To insert the lateral flight plan, the pilot can use either a company route number or an ICAO four-letter city pair. The lateral flight plan includes the following elements :
- Takeoff runway
- Standard instrument departure (SID) and transition to en route mode
- En route waypoints and airways
- Transition from en route mode and standard terminal arrival route (STAR)
- Landing runway with selected approach and approach via
- Missed approach
- Alternate flight plan

EXAMPLE



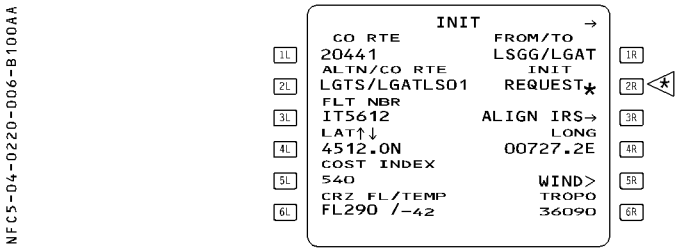
The FMGS is able to string together different types of legs corresponding to specific patterns (such as DME arc legs, or procedure turns) that are heading or track referenced. These are defined in the database : The pilot cannot create these legs.
Departure and arrival procedures, defined in the database, may be divided into several parts, as illustrated in the following drawing.



FLIGHT PLAN CONSTRUCTION

There are three ways to define the route :

(1) It is a company route, it is in the database, and it is known by the crew.
The pilot enters the name of the CO RTE into the 1L field of the INIT A page. This action enters all elements of the flight plan. The database usually includes an alternate route associated with the destination.



FLIGHT PLANNING

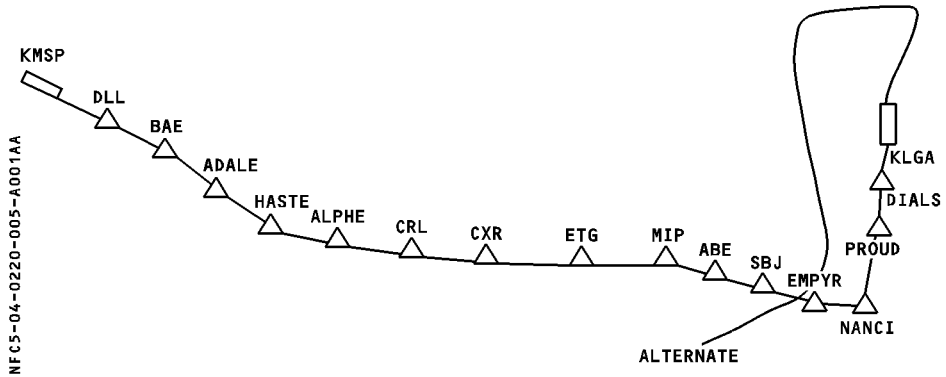
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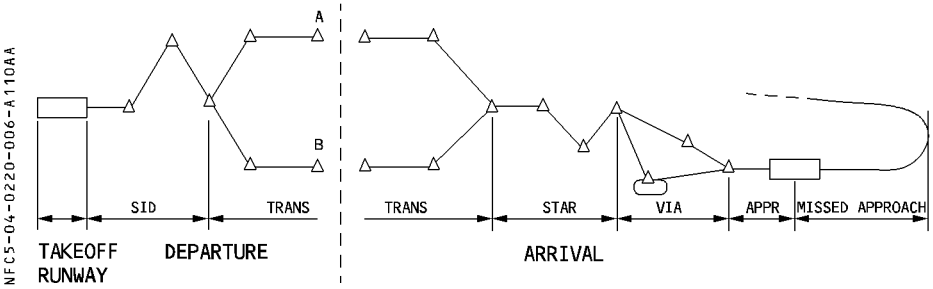
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EXAMPLE



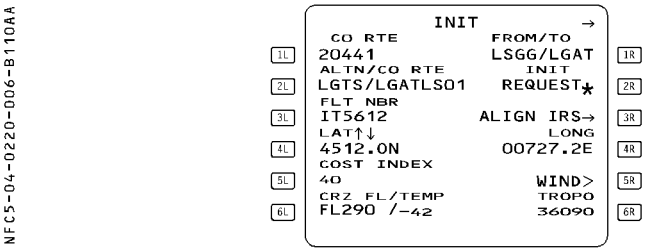
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FLIGHT PLAN CONSTRUCTION

There are three ways of defining the route :

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FLIGHT PLANNING

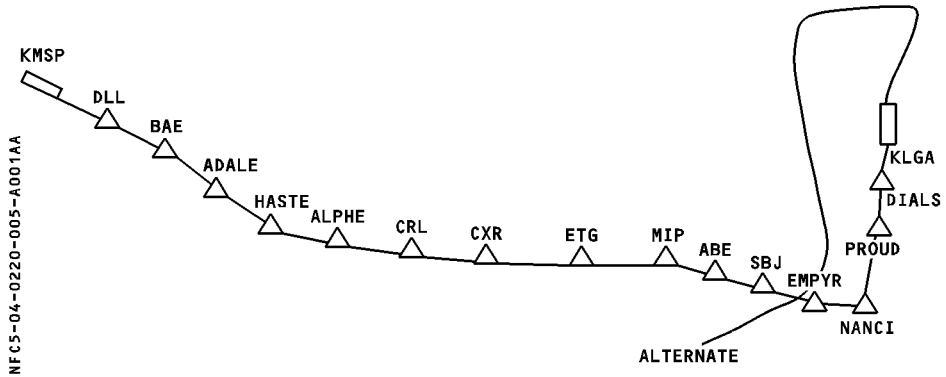
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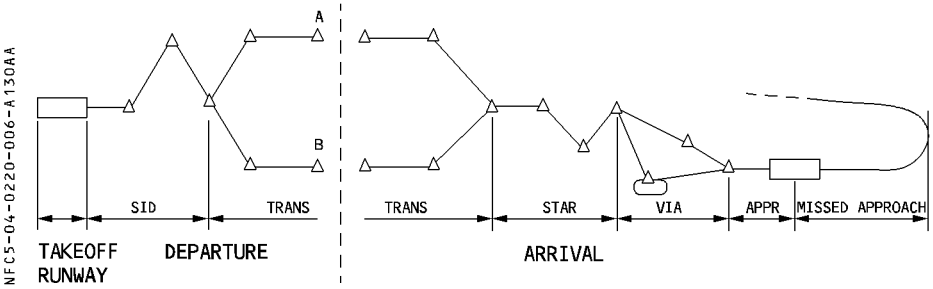
LATERAL FLIGHT PLANNING

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EXAMPLE



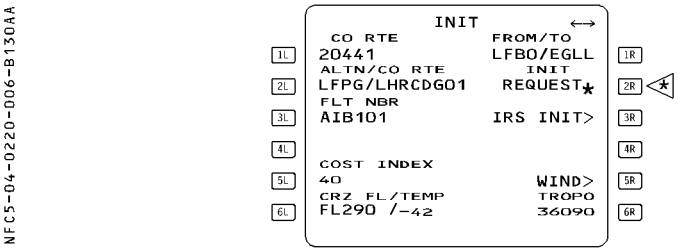
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FLIGHT PLAN CONSTRUCTION

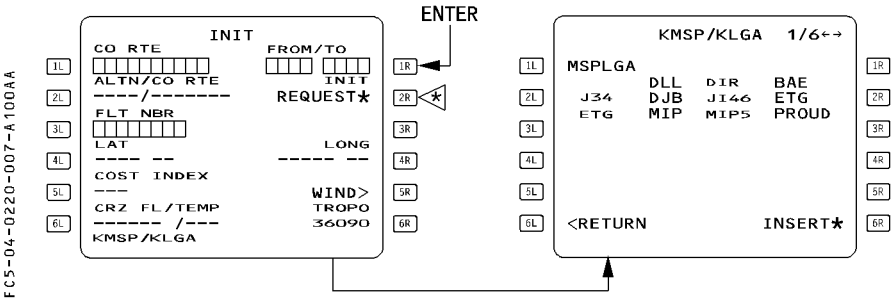
There are three ways of defining the route :

(1) A company route, that is in the database, and is known by the flight crew.
The crew enters the name of the CO RTE into the 1L field of the INIT A page. This action enters all the elements of the flight plan. The database usually includes an alternate route associated with the destination.



(2) It is a company route and it is in the database, but the crew does not know it is there.

The pilot enters a city pair in the 1R field. The ROUTE SELECTION page automatically appears and permits the crew to review all stored routes between the two cities before selecting one of them.



(3) There is no company route between the two cities.

The pilot enters the city pair in the 1R field. The ROUTE SELECTION page appears and displays "NONE".

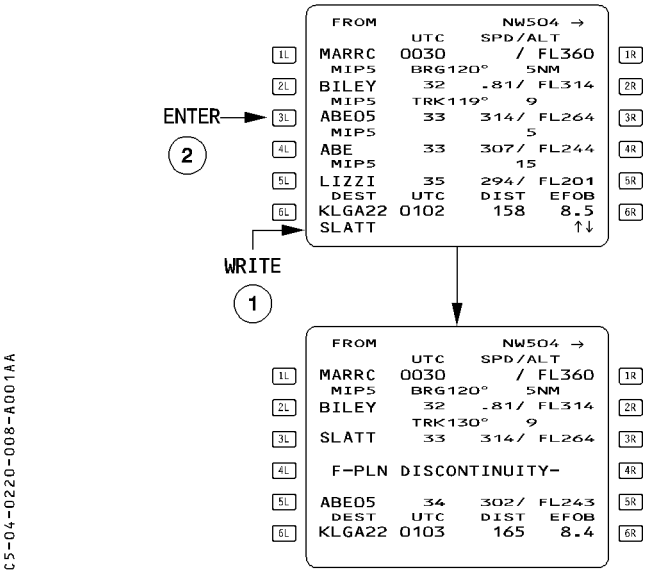
The pilot has to manually construct the entire flight plan.

Refer to the procedure explained in 4.05.10.

LATERAL REVISION

The crew can revise the lateral flight plan in three ways :

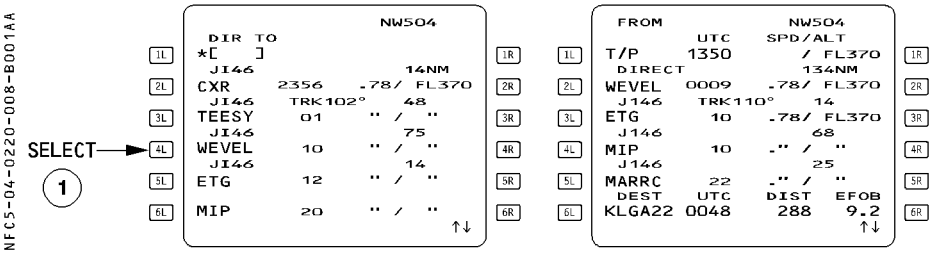
(1) Insert a new waypoint directly on the F-PLN page, or delete a waypoint from it.



When the pilot enters a new waypoint, the following waypoint moves down the flight plan, with a discontinuity shown between it and the new one.

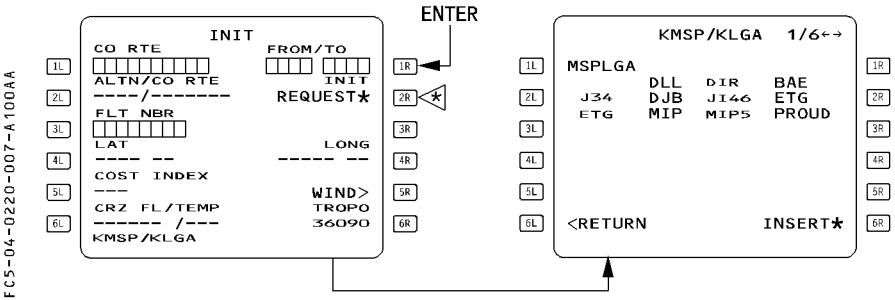
(2) Add a DIR TO.

The crew can change the "TO" waypoint of the active leg. The active leg then goes from present position (T/P) to the waypoint selected or inserted as the new "TO" waypoint.



(2) It is a company route and it is in the database, but the crew does not know it is there.

The pilot enters a city pair in the 1R field. The ROUTE SELECTION page automatically appears and permits the crew to review all stored routes between the two cities before selecting one of them.



(3) There is no company route between the two cities.

The pilot enters the city pair in the 1R field. The ROUTE SELECTION page appears and displays "NONE".

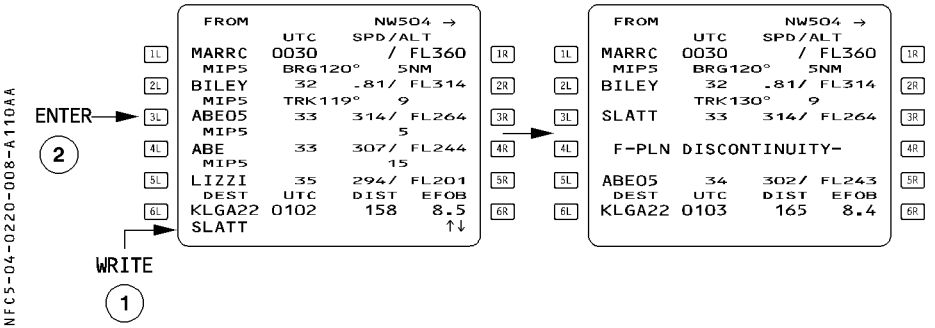
The pilot has to manually construct the entire flight plan.

Refer to the procedure explained in 4.05.10.

LATERAL REVISION

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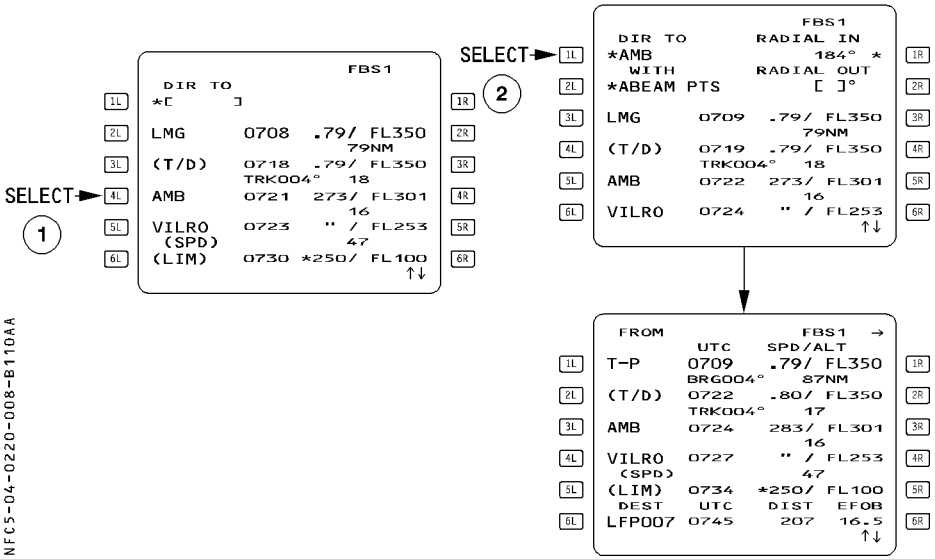
(1)Insert or delete a waypoint directly on the F-PLN page :



When the pilot enters a new waypoint, the following waypoint moves down the flight plan, with a discontinuity shown between it and the new one.

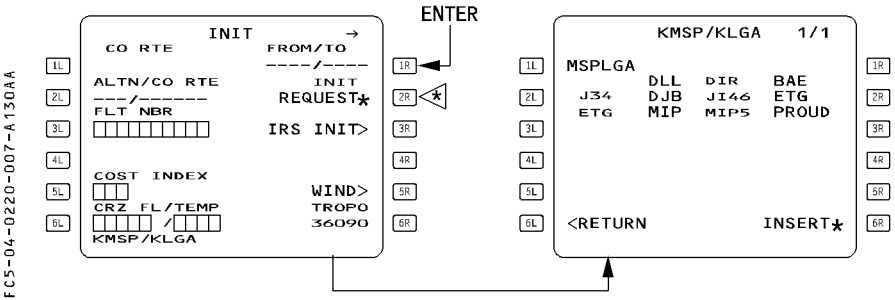
(2) Add a DIR TO :

The crew can change the "TO" waypoint of the active leg. The DIR TO function gives access to DIR TO, DIR TO ABEAM, or DIR TO/INTERCEPT. The active leg then goes from the present position (T/P) to the waypoint selected or inserted as the new "TO" waypoint.



(2) A company route, that is in the database, but the flight crew does not know it is there.

The crew enters a city pair in the 1R field. The ROUTE SELECTION page automatically appears and enables the crew to review all stored routes between the two cities before selecting one of them.



NFCS-04-0220-007-A13DAA

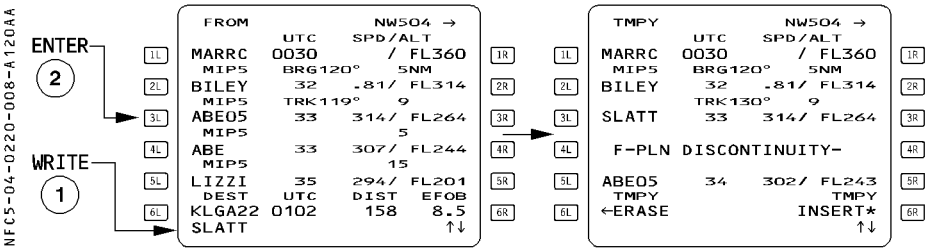
(3) There is no company route between the two cities.

The crew enters the city pair in the 1R field. "NONE" automatically appears in the CO RTE [1L] field, without automatically displaying the ROUTE SELECTION page.
The crew has to manually construct the entire flight plan.
Refer to the FCOM 4.05.10 for the procedure.

LATERAL REVISION

R The flight crew can revise the lateral flight plan in three ways :

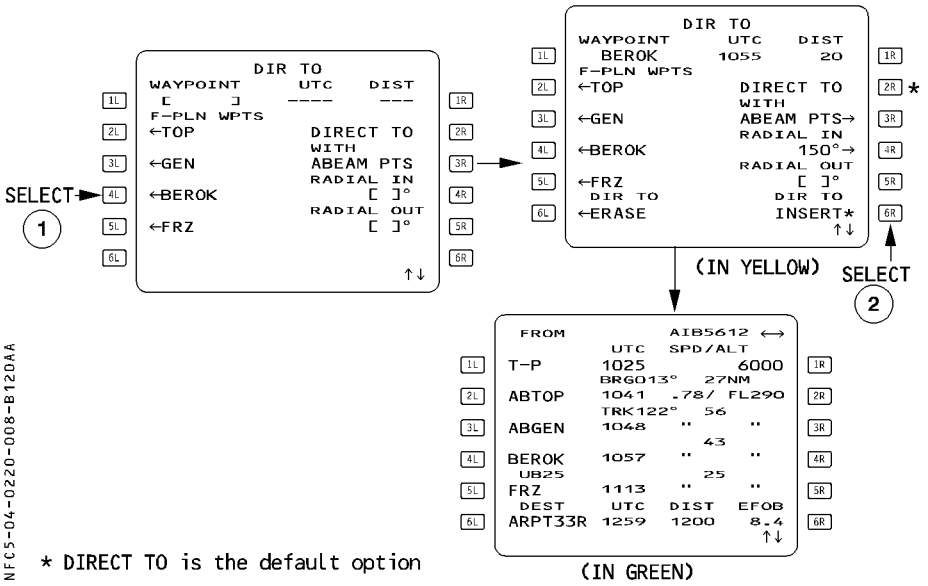
(1) Insert or delete a waypoint directly on the F-PLN page :



R When the flight crew inserts or deletes a waypoint, a temporary F-PLN is created.
R – After inserting a waypoint, a F-PLN discontinuity is inserted between the inserted waypoint and the following one.
R – After deleting a waypoint, a F-PLN discontinuity is inserted between the preceding waypoint and the following one.
R The flight crew should clear the discontinuity as appropriate, check the temporary F-PLN and insert it in the active F-PLN.

(2) Add a DIR TO :

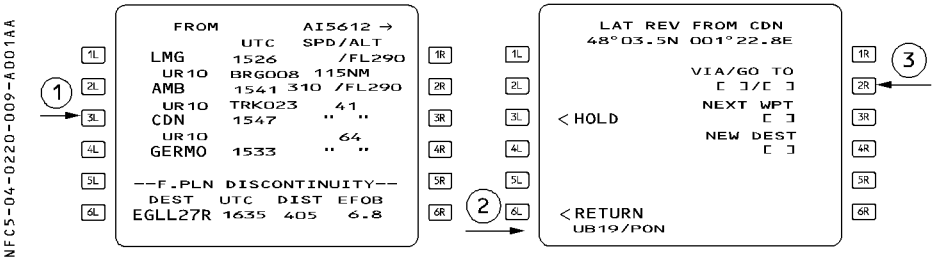
R



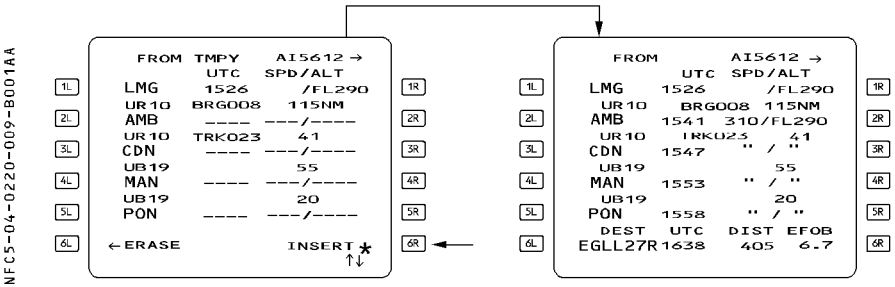
(3) Create a temporary flight plan, then insert it as a revision to the active flight plan:

R The crew does this when selecting, deleting, or modifying several waypoints of an airway or procedure at once.

The purpose of the temporary flight plan is to enable the pilot to review the revision on the MCDU and on the ND before inserting it into the active flight plan.



A temporary revision is displayed for a check and/or new modification.
Inserting it will modify the active flight plan.



R Refer to the FCOM 4.04 for a detailed explanation.

VERTICAL FLIGHT PLANNING

Data entry

The vertical flight plan gives the FMGS all the data required to calculate performance and predictions.

R This data is either entered by the flight crew or calculated by the FMS.

There are three categories of data :

- **Strategic data, which applies to the overall flight profile (pilot-entered data)**
  - Cost Index (CI)
  - Cruise Flight Level (CRZ FL)
  - Zero-Fuel Weight (ZFW)
  - R Zero-Fuel Weight Center of Gravity (ZFWCG)
  - Block Fuel

R - **Weather data (pilot-entered or measured data)**
  - R Winds (for climb, cruise, descent, approach)
  - R Sea level atmospheric pressure (QNH) at destination
  - R Surface temperature (TEMP) at destination
  - R Temperature in cruise phase
  - R The Tropopause altitude

- **Tactical data for the flight phases**
  - * Phase switching conditions
    - Setting of the thrust levers to takeoff-go-around (TOGA) or FLEX positions
    - Reaching acceleration altitude (ACCEL ALT)
    - Entering cruise (top of climb, T/C)
    - Initiation of descent (top of descent, T/D)
    - Passing a deceleration pseudo waypoint (DECEL PSEUDO WPT)
    - Touchdown
  - * Speed profile
    - V2
    - Economy climb speed or Mach (ECON CLB SPD/MACH)
    - Preselected speed or Mach (SPD/MACH PRESELECTION)
    - Economy cruise Mach (ECON CRZ MACH)
    - Economy descent Mach or speed (ECON DES MACH/SPD)
    - Approach speed (VAPP)
  - * Vertical limitations
    - Speed limits (SPD LIMIT)
    - Speed and altitude constraints (SPD AND ALT CSTR), time constraint (if installed)

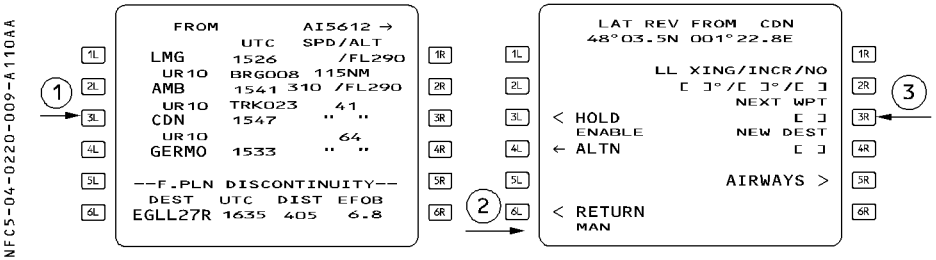
R In addition to the pilot-entered data, the FMS uses some real flight data parameters (CRZ
R SAT, actual wind) to improve the accuracy of the computed predictions.

(3) Create a temporary flight plan, then insert it as a revision to the active flight plan:

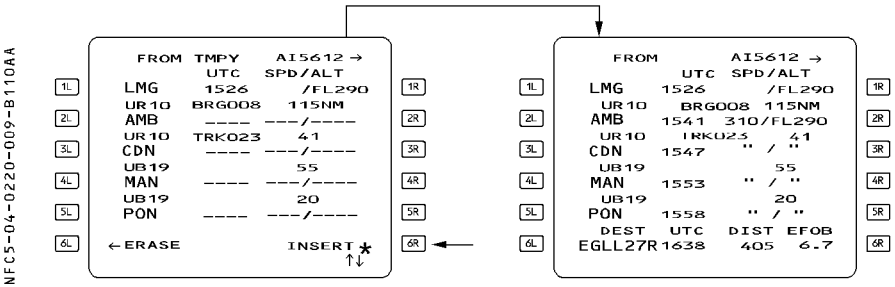
The crew does this when selecting, deleting, or modifying several waypoints of an airway or procedure at once.

The purpose of the temporary flight plan is to enable the pilot to review the revision on the MCDU and on the ND before inserting it into the active flight plan.

R



A temporary revision is displayed for a check and/or new modification.
Inserting it will modify the active flight plan.



R Refer to the FCOM 4.04 for a detailed explanation.

VERTICAL FLIGHT PLANNING

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R This data is either entered by the flight crew or calculated by the FMS.

There are three categories of data :

- **Strategic data, which applies to the overall flight profile (pilot-entered data)**
  - Cost Index (CI)
  - Cruise Flight Level (CRZ FL)
  - Zero-Fuel Weight (ZFW)
  - R Zero-Fuel Weight Center of Gravity (ZFWCG)
  - Block Fuel

- R **Weather data (pilot-entered or measured data)**
  - R Winds (for climb, cruise, descent, approach)
  - R Sea level atmospheric pressure (QNH) at destination
  - R Surface temperature (TEMP) at destination
  - R Temperature in cruise phase
  - R The Tropopause altitude

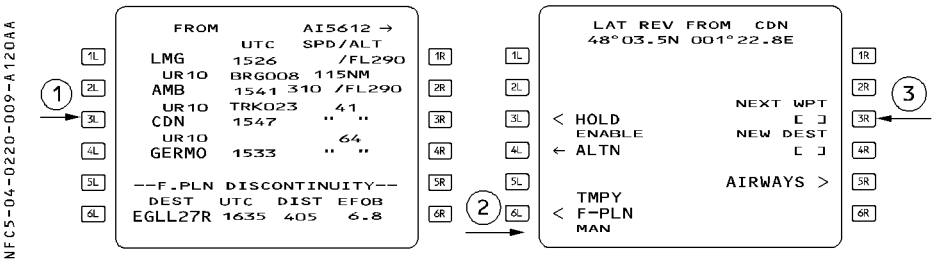
- **Tactical data for the flight phases**
  - * Phase switching conditions
    - Setting of the thrust levers to takeoff-go-around (TOGA) or FLEX positions
    - Reaching acceleration altitude (ACCEL ALT)
    - Entering cruise (top of climb, T/C)
    - Initiation of descent (top of descent, T/D)
    - Passing a deceleration pseudo waypoint (DECEL PSEUDO WPT)
    - Touchdown
  - * Speed profile
    - V2
    - Economy climb speed or Mach (ECON CLB SPD/MACH)
    - Preselected speed or Mach (SPD/MACH PRESELECTION)
    - Economy cruise Mach (ECON CRZ MACH)
    - Economy descent Mach or speed (ECON DES MACH/SPD)
    - Approach speed (VAPP)
  - * Vertical limitations
    - Speed limits (SPD LIMIT)
    - Speed and altitude constraints (SPD AND ALT CSTR), time constraint (if installed)

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R SAT, actual wind) to improve the accuracy of the computed predictions.

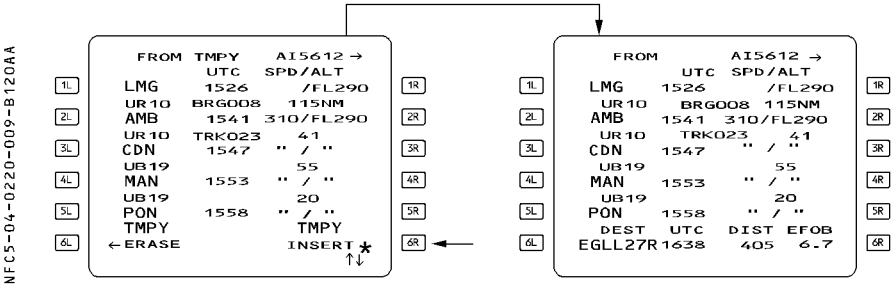
R The flight crew can perform a "DIR TO" to a waypoint in the F-PLN. Different options may
R be used to perform a "DIR TO" : DIRECT TO, DIR TO WITH ABEAM POINTS, RADIAL IN,
R RADIAL OUT. A temporary F-PLN is automatically created when the waypoint has been
R selected. After inserting the "DIR TO", the active leg goes from present position (T/P) to the
R selected waypoint.

(3) Use the LAT REV function :

The flight crew uses the LAT REV function when selecting, deleting or modifying a departure and arrival, a waypoint, a destination, a holding pattern, an airway, or an offset. All revisions are inserted in the temporary F-PLN to enable the flight crew to review the revision on the MCDU and ND, before inserting it into the active F-PLN.



The temporary flight plan is displayed for a check and/or new modification.
Inserting the temporary revision will modify the active flight plan.



Refer to the FCOM 4.04 for a detailed explanation.

VERTICAL FLIGHT PLANNING

Data entry

The vertical flight plan provides the FMGS with all the data required to calculate performance and predictions. This data either automatically comes from the database, or is manually entered by the flight crew.
There are three categories of data :

- **Strategic data, that applies to the overall flight profile**
  Cost Index (CI)
  Cruise Flight Level (CRZ FL) and STEP ALTS if any
  Zero-Fuel Weight (ZFW)
  Zero-Fuel Weight Center of Gravity (ZFWCG)
  Block Fuel
- **Tactical data for the flight phases**

  * **Phase switching conditions :**
    Setting the thrust levers to TOGA or FLEX
    Reaching the acceleration altitude (ACCEL ALT)
    Entering cruise (top of climb, T/C)
    Initiating descent (top of descent, T/D)
    Passing a deceleration pseudo-waypoint (DECEL PSEUDO WPT)
    Touchdown

  * **Speed profile :**
    V2
    Economy climb speed or Mach (ECON CLB SPD/MACH)
    Preselected speed or Mach (SPD/MACH PRESELECTION)
    Economy cruise Mach (ECON CRZ MACH)
    Constant Mach
    Economy descent Mach or speed (ECON DES MACH/SPD)
    Approach speed (VAPP)

  * **Limitations :**
    Speed limits (SPD LIMIT)
    Speed and altitude constraints (SPD and ALT CSTR),
    Time constraints or Required Time of Arrival (RTA)
- **Weather data**
  Winds (for climb, cruise, descent, approach)
  Sea level atmospheric pressure (QNH) at destination
  Surface temperature (TEMP) at destination
  Static Air Temperature at cruise flight level (SAT)
  Tropopause altitude (TROPO)

FLIGHT PHASES

The vertical flight plan is divided into flight phases. For each phase, the FMGS computes the optimum speed or Mach Profile.
These flight phases are :
Preflight - Takeoff - Climb - Cruise - Descent - Approach - Go-Around - Done.

R

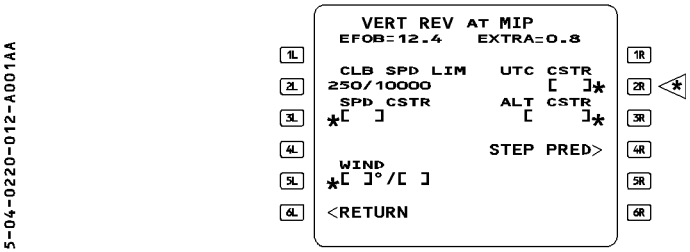
FLIGHT PHASES	OPTIMUM SPEED PROFILE	SWITCHING CONDITIONS TO NEXT PHASE
PREFLIGHT	/	SRS takeoff mode engaged and N1 > 85 % (EPR ≥ 1.25) or Ground Speed > 90 knots
TAKEOFF	V2 (V2 + 10)	At acceleration altitude or by engagement of another vertical mode.
CLIMB	ECON CLB SPD / MACH	Reaching cruise FL
CRUISE	ECON CRZ MACH	No step descent, and distance to destination < 200 NM
DESCENT	ECON DES MACH / SPD	– Overflying (DECEL) pseudowaypoint with NAV (or LOC*/LOC) mode engaged and altitude < 7200 ft AGL – Manual activation of the approach phase.
APPROACH	Vapp (GS Min)	1. To Go-Around : When thrust levers at TO.GA detent, or 2. To Done : 30 seconds after landing, or 3. To Climb : When inserting a new CRZ FL.
GO-AROUND	Vapp or current SPD, whichever is greater. Green Dot at ACC ALT	1. To Approach : Manual activation of the approach phase, or 2. To Climb : Above acceleration altitude by – Selecting ALTN, or – inserting NEW DEST and CRZ FL
DONE	/	To preflight : When INIT or PERF key depressed.

Note : During the preflight phase, the pilot inserts the flight plan, which includes all data needed for the flight.
During the done phase, the FMGC erases the data entered for the flight.
If the descent or the approach phase is inadvertently activated (manual approach phase activation, for example), the pilot may reselect a CRZ FL on the PROG page to reactivate the CRZ phase.

VERTICAL REVISION

The pilot uses vertical revisions to enter or modify
- the speed limit in the climb and descent phases
- constraints on altitude or speed
- a step climb or a step descent
- new wind data
- a time constraint (optional)

The vertical revision page is accessed by pressing a right hand select key of the flight plan page.



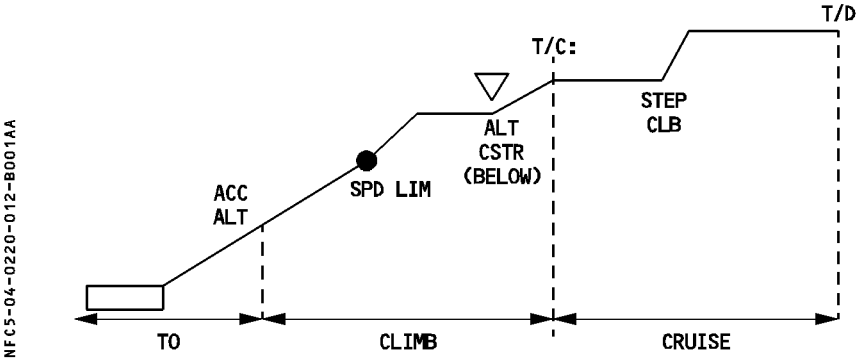
VERT REV AT CRUISE WPT

VERTICAL CONSTRAINTS (SPEED, ALTITUDE, TIME)

The pilot enters constraint on speed and altitude either to comply with ATC requests and specified procedures or in response to operational judgment.

Speed limit

A speed limit is associated with altitude as a maximum speed below a specified altitude (only one in climb and one in descent).



FLIGHT PHASES

The vertical flight plan is divided into flight phases. For each phase, the FMGS computes the optimum speed or Mach Profile.
These flight phases are :
Preflight - Takeoff - Climb - Cruise - Descent - Approach - Go-Around - Done.

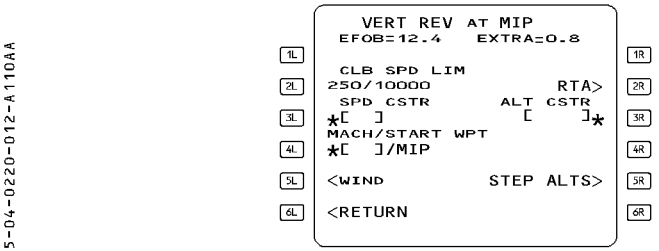
FLIGHT PHASES	OPTIMUM SPEED PROFILE	SWITCHING CONDITIONS TO NEXT PHASE
PREFLIGHT	/	SRS takeoff mode engaged and N1 > 85 % (EPR ≥ 1.25) or Ground Speed > 90 knots
TAKEOFF	V2 (V2 + 10)	At acceleration altitude or by engagement of another vertical mode.
CLIMB	ECON CLB SPD / MACH	Reaching cruise FL
CRUISE	ECON CRZ MACH	No step descent, and distance to destination < 200 NM, or all engines operative and selected altitude below Max (FL 200, highest DES ALT CSTR)
DESCENT	ECON DES MACH / SPD	– Overflying (DECEL) pseudowaypoint with NAV (or LOC*/LOC) mode engaged and altitude < 7200 ft AGL – Manual activation of the approach phase.
APPROACH	Vapp (GS Min)	1. To Go-Around : When thrust levers at TO.GA detent, or 2. To Done : 30 seconds after landing, or 3. To Climb : When inserting a new CRZ FL.
GO-AROUND	Vapp or current SPD, whichever is greater. Green Dot at ACC ALT	1. To Approach : Manual activation of the approach phase, or 2. To Climb : Above acceleration altitude by – Selecting ALTN, or – inserting NEW DEST
DONE	/	To preflight : When INIT or PERF key depressed.

Note : During the preflight phase, the pilot inserts the flight plan, which includes all data needed for the flight.
During the done phase, the FMGC erases the data entered for the flight.
If the descent or the approach phase is inadvertently activated (manual approach phase activation, for example), the pilot may reselect a CRZ FL on the PROG page to reactivate the CRZ phase.

VERTICAL REVISION

The pilot uses vertical revisions to enter, or modify :
- The speed limit in the climb and descent phases ;
- Constraints on altitude, or speed ;
- A step climb, or a step descent ;
- New wind data ;
- A time constraint.

The vertical revision page is accessed by pressing a right hand select key of the flight plan page.



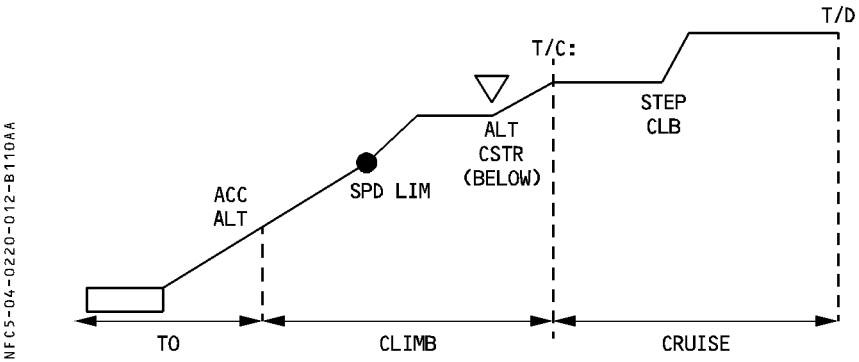
VERT REV AT CRUISE WPT

VERTICAL CONSTRAINTS (SPEED, ALTITUDE, TIME)

The pilot enters speed, altitude and time constraints to either comply with ATC requests and specified procedures, or at the pilot's discretion in response to operational variables.

Speed limit

A speed limit is associated with altitude, as a maximum speed below a specified altitude (only one in climb and one in descent).



FLIGHT PHASES

The vertical flight plan is divided into flight phases. For each phase, the FMGS computes the optimum speed or Mach Profile.
These flight phases are :
Preflight - Takeoff - Climb - Cruise - Descent - Approach - Go-Around - Done.

FLIGHT PHASES	OPTIMUM SPEED PROFILE	SWITCHING CONDITIONS TO NEXT PHASE
PREFLIGHT	/	SRS takeoff mode engaged and N1 > 85 % (EPR ≥ 1.25) or Ground Speed > 90 knots
TAKEOFF	V2 (V2 + 10)	At acceleration altitude or by engagement of another vertical mode.
CLIMB	ECON CLB SPD / MACH	Reaching cruise FL
CRUISE	ECON CRZ MACH	No step descent, and distance to destination < 200 NM, or all engines operative and selected altitude below Max (FL 200, highest DES ALT CSTR)
DESCENT	ECON DES MACH / SPD	– Overflying (DECEL) pseudowaypoint with NAV (or LOC*/LOC) mode engaged and altitude < 7200 ft AGL – Manual activation of the approach phase.
APPROACH	Vapp (GS Min)	1. To Go-Around : When thrust levers at TO.GA detent, or 2. To Done : 30 seconds after landing, or 3. To Climb : When inserting a new CRZ FL.
GO-AROUND	Vapp or current SPD, whichever is greater. Green Dot at ACC ALT	1. To Approach : Manual activation of the approach phase, or 2. To Climb : Above acceleration altitude by – Selecting ALTN, or – inserting NEW DEST
DONE	/	To preflight : When INIT or PERF key depressed.

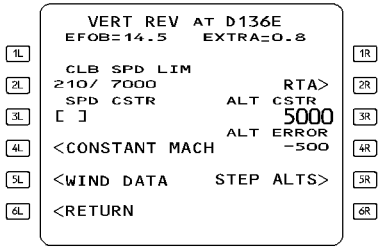
Note : During the preflight phase, the pilot inserts the flight plan, which includes all data needed for the flight.
During the done phase, the FMGC erases the data entered for the flight.
If the descent or the approach phase is inadvertently activated (manual approach phase activation, for example), the pilot may reselect a CRZ FL on the PROG page to reactivate the CRZ phase.

VERTICAL REVISION

The flight crew uses vertical revisions to enter, or modify :
- The speed limit in the climb and descent phases
- An altitude or speed constraint at the revised waypoint
- A time constraint (RTA)
- A Constant Mach value to be kept in cruise
- A step climb, or a step descent
- New wind data.

The vertical revision page is accessed by pressing a right-hand select key of the flight plan page.

NFC5-04-0220-012-A130AA



VERT REV AT A CLIMB WPT

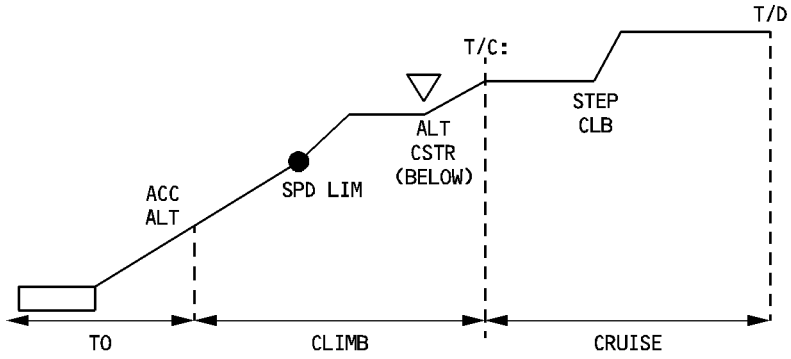
VERTICAL CONSTRAINTS (SPEED, ALTITUDE, TIME)

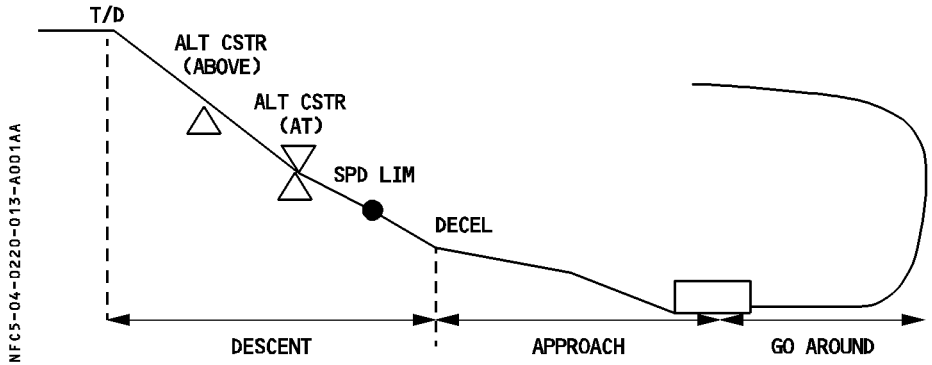
The pilot enters speed, altitude and time constraints, either to comply with ATC requests and specified procedures, or at the pilot's discretion, in response to operational variables.

Speed limit

A speed limit is associated with altitude, as a maximum speed below a specified altitude (only one in climb and one in descent).

NFC5-04-0220-012-B130AA





Altitude constraint

Altitude constraints may be attached to specific waypoints in the climb, descent, or approach phases.

To meet the altitude constraint, the aircraft must fly over the waypoint at an altitude equal, above or below the altitude constraint as specified by the crew or the database.

An altitude constraint is considered as missed if the system predicts more than 250 feet of difference between the constraint value and the predicted aircraft altitude.

Altitude constraints are observed in CLB or DES or APP NAV-FINAL modes.

Note : The database may contain an altitude constraint window (two altitudes between which the aircraft must fly passing over a given waypoint), but the flight crew cannot enter such a constraint manually.

Speed constraint

Speed constraints may be attached to specific waypoints in the climb, descent or approach phases. To meet the speed constraint, the aircraft must fly over the waypoint with a speed equal or less than the speed constraint.

A speed constraint is considered as missed if the system predicts an aircraft speed 10 knots greater than the speed constraint.

Speed constraints are observed when NAV mode is engaged and speed target is managed. Otherwise speed constraints are disregarded.

Time constraint

Time constraint (optional) may be attached to any waypoint except the "from" waypoint.

Note : No constraint can be associated with go around waypoints.

PERFORMANCE FUNCTION

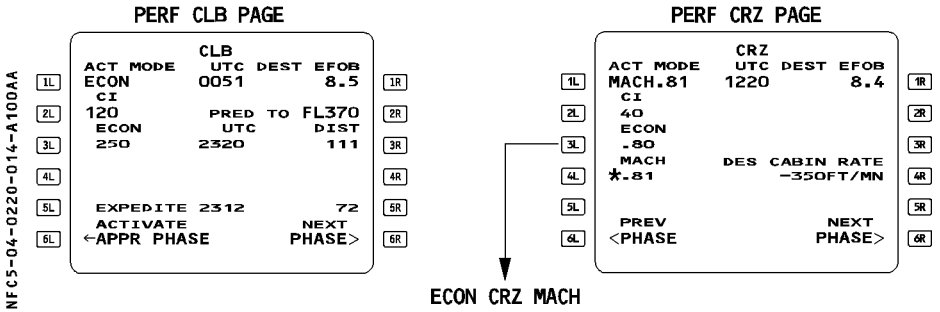
The performance function :
- Optimizes a flight plan
- Computes predictions

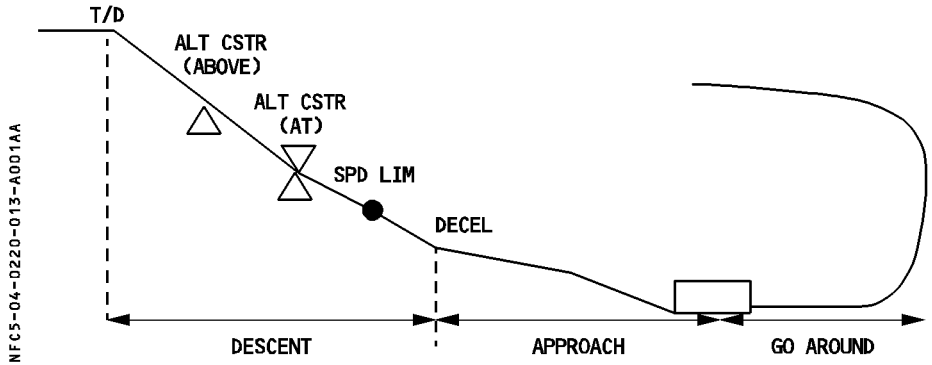
FLIGHT OPTIMIZATION

The optimization function computes :
- The best target speed for climb, cruise, and descent (ECON SPD/MACH).
- The best descent path from the cruise flight level to the destination airfield.
- An optimum flight level (for pilot's information).

BEST TARGET SPEED

It is computed by the FMGS (except for V2). The best target speed (ECON SPD/MACH) is the basis for the managed speed profile.
ECON SPD/MACH is a function of :
· Cost index (CI)
· Cruise flight level (CRZ FL)
R · Gross weight
· Wind and temperature models
The computer processes the ECON SPDs for the climb and descent phases before the initiation of the flight phase, and freezes the values once the flight phase becomes active.
The computer continually updates ECON CRUISE MACH (SPD), taking into account current weather conditions and modifications to the flight plan.
If the cruise FL is below FL 250, ECON CRUISE SPEED is computed.
If the cruise FL is above FL 250, ECON CRUISE MACH is computed.





Altitude constraint

Altitude constraints may be attached to specific waypoints in the climb, descent, or approach phases.

To meet the altitude constraint, the aircraft must fly over the waypoint at an altitude equal, above or below the altitude constraint as specified by the crew or the database.

An altitude constraint is considered as missed if the system predicts more than 250 feet of difference between the constraint value and the predicted aircraft altitude.

Altitude constraints are observed in CLB or DES or APP NAV-FINAL modes.

Note : The database may contain an altitude constraint window (two altitudes between which the aircraft must fly passing over a given waypoint), but the flight crew cannot enter such a constraint manually.

Speed constraint

Speed constraints may be attached to specific waypoints in the climb, descent or approach phases. To meet the speed constraint, the aircraft must fly over the waypoint with a speed equal or less than the speed constraint.

A speed constraint is considered as missed if the system predicts an aircraft speed 10 knots greater than the speed constraint.

Speed constraints are observed when NAV mode is engaged and speed target is managed. Otherwise speed constraints are disregarded.

Time constraint

Time constraint (optional) may be attached to any waypoint except the "from" waypoint.

Note : No constraint can be associated with go around waypoints.

PERFORMANCE FUNCTION

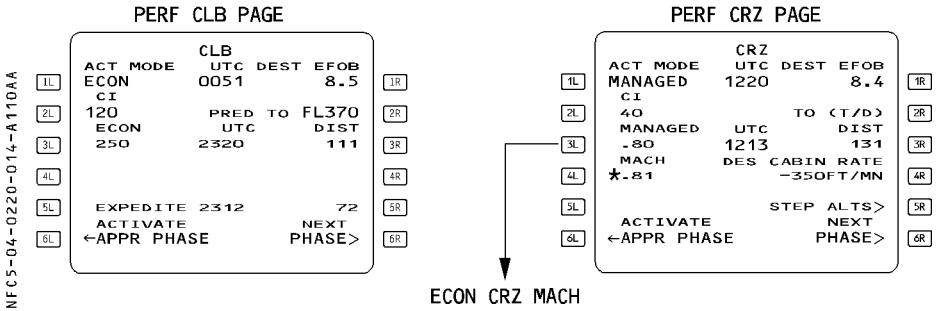
The performance function :
- Optimizes a flight plan
- Computes predictions

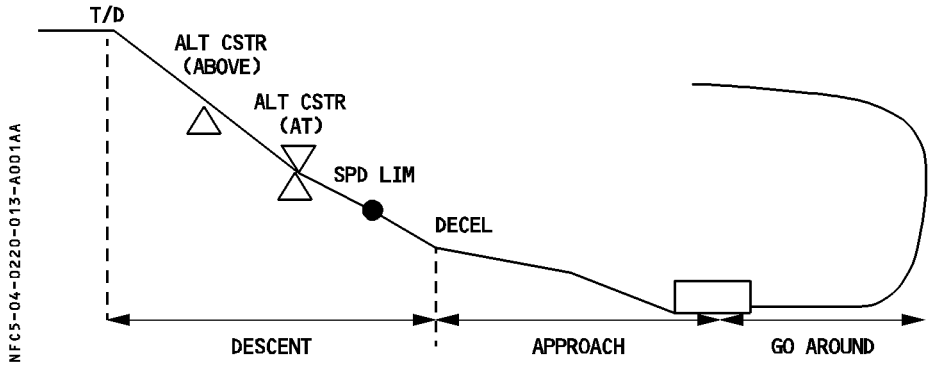
FLIGHT OPTIMIZATION

The optimization function computes :
- The best target speed for climb, cruise, and descent (ECON SPD/MACH).
- The best descent path from the cruise flight level to the destination airfield.
- An optimum flight level (for pilot's information).

BEST TARGET SPEED

It is computed by the FMGS (except for V2). The best target speed (ECON SPD/MACH) is the basis for the managed speed profile.
ECON SPD/MACH is a function of :
· Cost index (CI)
· Cruise flight level (CRZ FL)
R · Gross weight
· Wind and temperature models
The computer processes the ECON SPDs for the climb and descent phases before the initiation of the flight phase, and freezes the values once the flight phase becomes active.
The computer continually updates ECON CRUISE MACH (SPD), taking into account current weather conditions and modifications to the flight plan.
If the cruise FL is below FL 250, ECON CRUISE SPEED is computed.
If the cruise FL is above FL 250, ECON CRUISE MACH is computed.





Altitude constraint

Altitude constraints may be attached to specific waypoints in the climb, descent, or approach phases.

To meet the altitude constraint, the aircraft must fly over the waypoint at an altitude equal, above or below the altitude constraint as specified by the crew or the database.

An altitude constraint is considered as missed if the system predicts more than 250 feet of difference between the constraint value and the predicted aircraft altitude.

Altitude constraints are observed in CLB or DES or APP NAV-FINAL modes.

Note : The database may contain an altitude constraint window (two altitudes between which the aircraft must fly passing over a given waypoint), but the flight crew cannot enter such a constraint manually.

Speed constraint

Speed constraints may be attached to specific waypoints in the climb, descent or approach phases. To meet the speed constraint, the aircraft must fly over the waypoint with a speed equal or less than the speed constraint.

A speed constraint is considered as missed if the system predicts an aircraft speed 10 knots greater than the speed constraint.

Speed constraints are observed when NAV mode is engaged and speed target is managed. Otherwise speed constraints are disregarded.

Time constraint

Time constraint (optional) may be attached to any waypoint except the "from" waypoint.

Note : No constraint can be associated with go around waypoints.

PERFORMANCE FUNCTION

The performance function :
- Optimizes a flight plan
- Computes predictions.

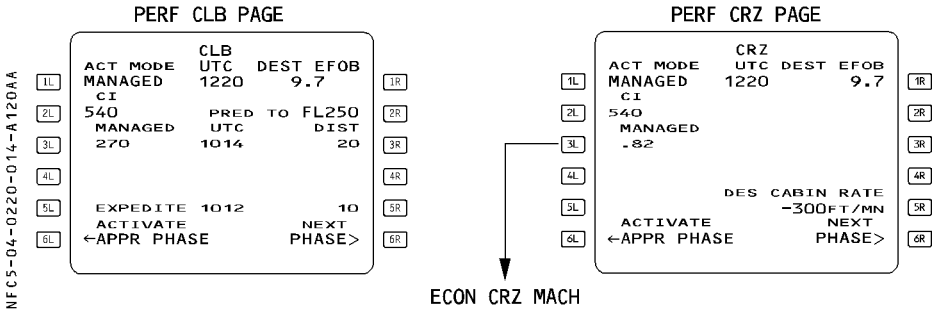
FLIGHT OPTIMIZATION

The optimization function computes :
- The best target speed for climb, cruise, and descent (ECON SPD/MACH).
- The best descent path from the cruise flight level to the destination airfield.
- An optimum flight level (for pilot's information).

BEST TARGET SPEED

Computed by the FMGS (except for V2), the best target speed (ECON SPD/MACH) is the basis for the managed speed profile.
ECON SPD/MACH is a function of :
· Cost index (CI)
· Cruise flight level (CRZ FL)
· Gross weight and CG location
· Wind and temperature models
The computer processes the ECON SPD (MACH) for the climb and descent phases before the initiation of the flight phase, and freezes the values once the flight phase becomes active.
The computer continously updates ECON CRUISE MACH (SPD), taking into account current weather conditions and modifications to the flight plan.
If the cruise FL is below FL 250, ECON CRUISE SPEED is computed.
If the cruise FL is above FL 250, ECON CRUISE MACH is computed.

R



WIND PROFILE

To obtain the best predictions, the pilot must enter the wind for the various flight phases and specifically for waypoints in cruise.

ON GROUND : During flight planning "initialization", enter the winds for the climb and cruise phases using the HISTORY WIND and WIND pages. Enter, manually or with ACARS, different wind values in the climb and cruise phases. The system will compute a wind for all waypoints of the F-PLN using linear interpolation between manual/ACARS entries.

The wind profile will be displayed on the F-PLN B page, and is called forecast wind profile. Pilot or ACARS entries are displayed in large font, and system-computed winds in small font.

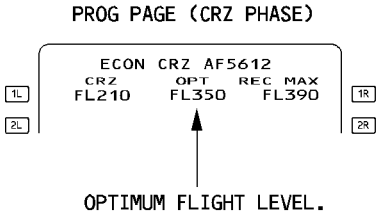
The forecast wind profile will be used to compute fuel and time predictions, as well as ECON speed/Mach targets.

IN FLIGHT : The system updates the predictions and the current ECON speed, using the measured wind at the present position. It combines actual wind and forecast winds to compute the wind ahead of the aircraft, but this is totally transparent to the crew.

During cruise, the pilot will enter the descent winds and the approach wind. The system will update the final predictions, compute the best descent profile and best speed in descent and approach.

OPTIMUM FLIGHT LEVEL

NFC5-04-0220-015-A100AA



The optimum flight level (OPT FL) indicates the most economic flight level for a given cost index, weight, weather data. It is continuously updated in flight.

R The OPT FL is a compromise between fuel and time saving : Its computation may show
R steps due to slight GW, ISA, or wind changes. As a result, the pilot may observe jumps
R in OPT FL.
R The computation of the OPT FL considers the wind entries made at the different altitudes
R (normally at the different CRZ FL).
R When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be
R affected by the wind entries made at the previous CRZ FL ; these winds are automatically
R propagated and may be significantly different from the actual winds.

Note : For simplification purposes, the FCOM/QRH gives the OPT FL at a given Mach number. It does not consider the cost index, therefore the FMGS and the FCOM/QRH valves are different.

BEST DESCENT PATH

The vertical flight path is computed to minimize fuel consumption, while satisfying the various altitude constraints and the descent speed profile, in order to reach VAPP at 1000 feet.

The computer calculates the descent profile before the descent phase is initiated, taking into account :

- All lateral and vertical flight plan data
- The descent and approach winds, as inserted into the DESCENT WIND page and PERF APPR page, and the required maximum cabin rate of descent.

During descent, the descent profile is updated, only if the flight plan is modified, or if data for the APPR phase (WIND, VAPP, or LDG CONF) are changed.

COST INDEX (CI)

This is a fundamental input for the ECON SPEED or ECON MACH computation. ECON SPEED and ECON MACH reduce the total flight cost in terms of flight time and fuel consumption (and not only in terms of fuel saving).

The airline's operations department usually defines the cost index, to optimize each company route.

The pilot does not ordinarily modify the cost index during a flight.

CI = 0 corresponds to minimum fuel consumption (Max Range).

CI = 999 corresponds to minimum time.

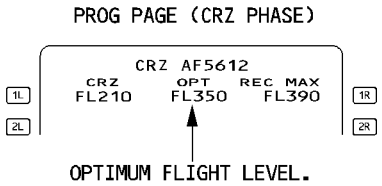
CI = Long Range Cruise (Refer to 4.05.50).

WIND PROFILE

To obtain the best predictions, the pilot must enter the wind for the various flight phases and for waypoints in cruise.
ON GROUND : During flight planning initialization, enter the winds for the climb and cruise phases using the HISTORY WIND and WIND pages. Enter manually, or with ACARS, different wind values in the climb and cruise phases. The system will compute a wind for all waypoints of the F-PLN using linear interpolation between manual/ACARS entries.
This wind profile will be displayed on the F-PLN B page and is called forecast wind profile. Pilot or ACARS entries are displayed in large font, and system-computed winds in small font.
The forecast wind profile is used to compute fuel and time predictions, as well as ECON speed/Mach targets.
IN FLIGHT : The system updates the predictions and the current ECON speed, using the measured wind at the present position. It mixes actual wind and forecast winds to compute the wind ahead of the aircraft but this is totally transparent to the crew.
During cruise, the pilot will enter descent winds and approach wind. The system will update the final predictions, compute the best descent profile and best speed in descent and approach.

OPTIMUM FLIGHT LEVEL

NFCS-04-0220-015-A110AA



The optimum flight level (OPT FL) indicates the most economic flight level for a given cost index, weight, weather data. It is continuously updated in flight. It ensures a 15-minute minimum cruise time.
The OPT FL is a compromise between fuel and time saving : Its computation may show steps due to slight GW, ISA or wind changes. As a result, the pilot may observe jumps in OPT FL.
The computation of the OPT FL considers the wind entries made at the different altitudes (normally at the different CRZ FL).
When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be affected by the wind entries made at the previous CRZ FL ; these winds are automatically propagated and may be significantly different from the actual winds.

Note : For simplification purposes, the FCOM/QRH gives the OPT FL at a given Mach number. It does not consider the cost index, therefore the FMGS and the FCOM/QRH valves are different.

BEST DESCENT PATH

The vertical flight path is computed to minimize fuel consumption, while satisfying the various altitude constraints and the descent speed profile, in order to reach VAPP at 1000 feet.

The computer calculates the descent profile before the descent phase is initiated, taking into account :

- All lateral and vertical flight plan data
- The descent and approach winds, as inserted into the DESCENT WIND page and PERF APPR page, and the required maximum cabin rate of descent.

During descent, the descent profile is updated, only if the flight plan is modified, or if data for the APPR phase (WIND, VAPP, or LDG CONF) are changed.

COST INDEX (CI)

This is a fundamental input for the ECON SPEED or ECON MACH computation. ECON SPEED and ECON MACH reduce the total flight cost in terms of flight time and fuel consumption (and not only in terms of fuel saving).

The airline's operations department usually defines the cost index, to optimize each company route.

The pilot does not ordinarily modify the cost index during a flight.

CI = 0 corresponds to minimum fuel consumption (Max Range).

CI = 999 corresponds to minimum time.

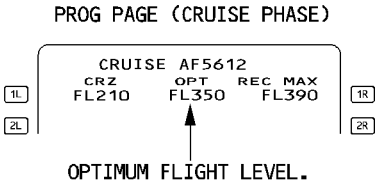
CI = Long Range Cruise (Refer to 4.05.50).

WIND PROFILE

To obtain the best predictions, the pilot must enter the wind for the various flight phases and for waypoints in cruise.
ON GROUND : During flight planning initialization, enter the winds for the climb and cruise phases using the HISTORY WIND and WIND pages. Enter manually, or with ACARS, different wind values in the climb and cruise phases. The system will compute a wind for all waypoints of the F-PLN using linear interpolation between manual/ACARS entries.
This wind profile will be displayed on the F-PLN B page, and is called forecast wind profile. Pilot or ACARS entries are displayed in large font, and system-computed winds in small font.
The forecast wind profile is used to compute fuel and time predictions, as well as ECON speed/Mach targets.
IN FLIGHT : The system updates the predictions and the current ECON speed, using the measured wind at the present position. It combines actual wind and forecast winds to compute the wind ahead of the aircraft, but this is totally transparent to the crew.
During cruise, the pilot will enter descent winds and approach wind. The system will update the final predictions, compute the best descent profile and best speed in descent and approach.

OPTIMUM FLIGHT LEVEL

NFCS-04-0220-015-A120AA



The optimum flight level (OPT FL) indicates the most economic flight level for a given cost index, weight, weather data. It is continuously updated in flight. It ensures a 15-minute minimum cruise time.
The OPT FL is a compromise between fuel and time saving : Its computation may show steps due to slight GW, ISA, or wind changes. As a result, the pilot may observe jumps in OPT FL.
The computation of the OPT FL takes into account the wind entries made at the different altitudes (normally at the different CRZ FL).
When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be affected by wind entries made at the previous CRZ FL ; these winds are automatically propagated and may be significantly different from the actual winds.

Note : For simplification purposes, the FCOM/QRH gives the OPT FL at a given Mach number. It does not consider the cost index, therefore the FMGS and the FCOM/QRH valves are different.

BEST DESCENT PATH

The vertical flight path is computed to minimize fuel consumption, while satisfying the various altitude constraints and the descent speed profile, in order to reach VAPP at 1000 feet.

The computer calculates the descent profile before the descent phase is initiated, taking into account :

- All lateral and vertical flight plan data
- The descent and approach winds, as inserted into the DESCENT WIND page and PERF APPR page, and the required maximum cabin rate of descent.

During descent, the descent profile is updated, only if the flight plan is modified, or if data for the APPR phase (WIND, VAPP, or LDG CONF) are changed.

COST INDEX (CI)

This is a fundamental input for the ECON SPEED or ECON MACH computation. ECON SPEED and ECON MACH reduce the total flight cost in terms of flight time and fuel consumption (and not only in terms of fuel saving).

The airline's operations department usually defines the cost index, to optimize each company route.

The pilot does not ordinarily modify the cost index during a flight.

CI = 0 corresponds to minimum fuel consumption (Max Range).

CI = 999 corresponds to minimum time.

CI = Long Range Cruise (Refer to 4.05.50).

COMPUTATION OF PREDICTIONS

The system calculates various predictions for the active flight plan and updates them continually during flight as functions of :

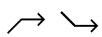
- Revisions to the lateral and vertical flight plans
- Current winds and temperature
- Present position versus lateral and vertical flight plans
- Current guidance modes

The MCDU and the ND show these predictions, each of which is based on specific assumptions.

Predicitions displayed on the Navigation Display (ND)

These predictions consist of :

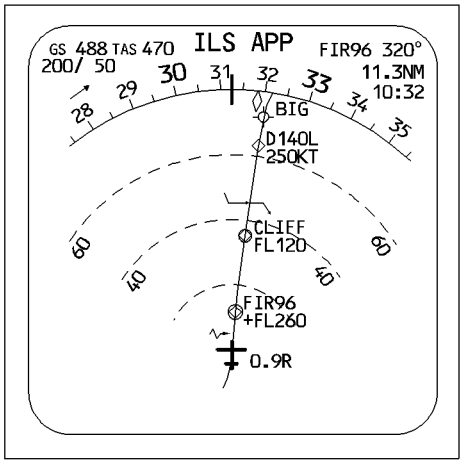
· symbols positioned along the lateral flight plan (NAV mode engaged) or the track line (NAV mode not engaged). These symbols (named as pseudo waypoints) and their meanings are :

Pseudo waypoint	Definition
	Level symbol, at the (top of climb or level-off) position where the aircraft will reach : – the FCU selected altitude (blue) or – the constrained altitude, if it is more restrictive than the FCU altitude and if appropriate modes are engaged (magenta).
	Top of descent or continue descent symbol : – top of descent (always white) – continue descent symbol (white if DES is not armed, blue if it is)
	Start of CLIMB symbol : – white if CLB is not armed – blue if CLB is armed
	Intercept point symbol : – the point where the aircraft is predicted to intercept the descent path, if there is any vertical deviation when the aircraft is in DES mode (white if DES is not engaged, blue if it is)
●	Speed change symbol : – the point at which the aircraft will initiate an automatic ACCEL or DECEL from current speed to a new computed speed if it encounters a SPD LIM, SPD CSTR, or HOLDING SPD (magenta)

R

Pseudo waypoint	Definition
Ⓓ	Decelerate point symbol, magenta : – Indicates the point at which the aircraft will start an automatic deceleration toward VAPP (and thus switch to the approach phase). Although the symbol is always displayed, automatic deceleration only occurs if in managed speed and NAV or approach mode is engaged.
◯	ALT CSTR symbol set around the constrained waypoint : – Magenta, when the ALT CSTR is predicted to be met – Amber, when the ALT CSTR is predicted to be missed – White, when the ALT CSTR is not taken into account by the FMGS, and the NAV mode is engaged.
◠	Energy circle symbol (green arc) centered on the aircraft position and oriented to the current track line. Represents the Required Distance to Land. Only displayed if the lateral guidance mode is heading or track, and the current FMS flight phase is in cruise, descent or approach, and the aircraft is within 180 NM of the destination.
Crosstrack error XX.X R or XX.XL (X is a number	The crosstrack error displays the lateral deviation between the aircraft position and the track of the F-PLN active leg. The value is limited to 99.9 NM left or right.
INTCPT	Intercept waypoint : Is displayed on the ND at the point at which the present track intercepts the F-PLN.

· Predicted time of arrival at the TO WPT is located in the upper right-hand corner of the ND. It assumes direct distance from the aircraft position to the TO WPT and assumes current ground speed will be constant.



NFCS-04-0220-018-A001AA

As a general rule, the ND indicates what the aircraft will fly, with the current active FG modes.

COMPUTATION OF PREDICTIONS

The system calculates various predictions for the active flight plan and updates them continually during flight as functions of :

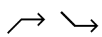
- Revisions to the lateral and vertical flight plans
- Current winds and temperature
- Present position versus lateral and vertical flight plans
- Current guidance modes

The MCDU and the ND show these predictions, each of which is based on specific assumptions.

Predicitions displayed on the Navigation Display (ND)

These predictions consist of :

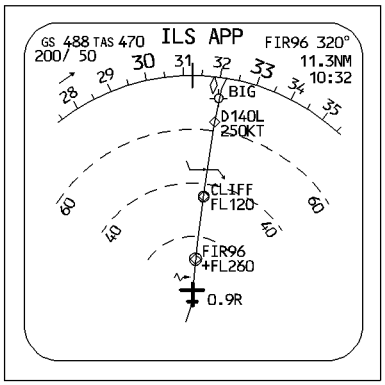
· symbols positioned along the lateral flight plan (NAV mode engaged) or the track line (NAV mode not engaged). These symbols (named as pseudo waypoints) and their meanings are :

Pseudo waypoint	Definition
	Level symbol, at the (top of climb or level-off) position where the aircraft will reach : – the FCU selected altitude (blue) or – the constrained altitude, if it is more restrictive than the FCU altitude and if appropriate modes are engaged (magenta).
	Top of descent or continue descent symbol : – top of descent (always white) – continue descent symbol (white if DES is not armed, blue if it is)
	Start of CLIMB symbol : – white if CLB is not armed – blue if CLB is armed
	Intercept point symbol : – the point where the aircraft is predicted to intercept the descent path, if there is any vertical deviation when the aircraft is in DES mode (white if DES is not engaged, blue if it is)
●	Speed change symbol : – the point at which the aircraft will initiate an automatic ACCEL or DECEL from current speed to a new computed speed if it encounters a SPD LIM, SPD CSTR, or HOLDING SPD (magenta)

R

Pseudo waypoint	Definition
Ⓓ	Decelerate point symbol : – Indicates the point at which the aircraft is predicted to decelerate for approach (and thus switch to the approach phase). – Magenta, if in managed speed and NAV or approach mode is engaged. – White, if in selected speed or HDG/TRK mode. – Automatic deceleration only occur when displayed in magenta.
○	ALT CSTR symbol set around the constrained waypoint : – Magenta when the ALT CSTR is predicted to be met – Amber when the ALT CSTR is predicted to be missed – White when the ALT CSTR is not taken into account by the FMGS, and the NAV mode is engaged.
○ 10 : 45 ○ (ETP)	Time marker and equitime point symbols appear in green to indicate where the aircraft reaches the time marker or equitime point.
◠	Energy circle symbol (green arc) centered on the aircraft position and oriented to the current track line. Represents the Required Distance to Land. Only displayed if the lateral guidance mode is heading or track, and the current FMS flight phase is in cruise, descent or approach, and the aircraft is within 180 NM of the destination.
Crosstrack error XX.X R or XX.XL (X is a number	The crosstrack error displays the lateral deviation between the aircraft position and the track of the F-PLN active leg. The value is limited to 99.9 NM left or right.
INTCPT	Intercept waypoint : Is displayed on the ND at the point at which the present track intercepts the F-PLN.

· Predicted time of arrival at the TO WPT is located in the upper right-hand corner of the ND. It assumes direct distance from the aircraft position to the TO WPT and assumes current ground speed will be constant.



NFCS-04-0220-018-A105AA

As a general rule, the ND indicates what the aircraft will fly, with the current active FG modes.

COMPUTATION OF PREDICTIONS

The system calculates various predictions for the active flight plan and updates them continually during flight as functions of :

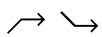
- Revisions to the lateral and vertical flight plans
- Current winds and temperature
- Present position versus lateral and vertical flight plans
- Current guidance modes

The MCDU and the ND show these predictions, each of which is based on specific assumptions.

Predicitions displayed on the Navigation Display (ND)

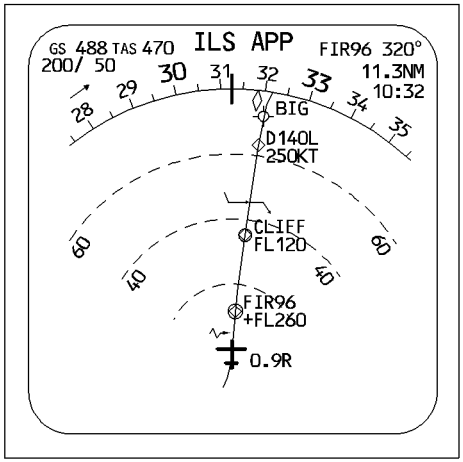
These predictions consist of :

· symbols positioned along the lateral flight plan (NAV mode engaged) or the track line (NAV mode not engaged). These symbols (named as pseudo waypoints) and their meanings are :

Pseudo waypoint	Definition
	Level symbol, at the (top of climb or level-off) position where the aircraft will reach : – the FCU selected altitude (blue) or – the constrained altitude, if it is more restrictive than the FCU altitude and if appropriate modes are engaged (magenta).
	Top of descent or continue descent symbol : – top of descent (always white) – continue descent symbol (white if DES is not armed, blue if it is)
	Start of CLIMB symbol : – white if CLB is not armed – blue if CLB is armed
	Intercept point symbol : – the point where the aircraft is predicted to intercept the descent path, if there is any vertical deviation when the aircraft is in DES mode (white if DES is not engaged, blue if it is)
●	Speed change symbol : – the point at which the aircraft will initiate an automatic ACCEL or DECEL from current speed to a new computed speed if it encounters a SPD LIM, SPD CSTR, or HOLDING SPD (magenta)

Pseudo waypoint	Definition
Ⓓ	Decelerate point symbol : – Indicates the point at which the aircraft is predicted to decelerate for approach (and thus switch to the approach phase). – Magenta, if in managed speed and NAV or approach mode is engaged. – White, if in selected speed or HDG/TRK mode. – Automatic deceleration only occurs when displayed in magenta.
○	ALT CSTR symbol around the constrained waypoint : – Magenta, when the ALT CSTR is predicted to be satisfied – Amber, when the ALT CSTR is predicted to be missed – White, when the ALT CSTR is not taken into account by the guidance, and the NAV mode is engaged.
○ (10 45) ○ (ETP)	The time marker and equi-time point symbols appear in green to indicate where the aircraft reaches the Time marker or equi-time point.
◠	Energy circle symbol (green arc) is centered on the a/c position and oriented to the current track line. It represents the Required Distance to Land. Only displayed in descent and approach phase when a selected lateral mode is engaged (HDG or TRK)
Crosstrack error XX.X R or XX.XL (X is a number	The crosstrack error displays the lateral deviation between the aircraft position and the track of the F-PLN active leg. The value is limited to 99.9 NM left or right.

· The predicted time of arrival at the TO WPT is in the upper right-hand corner of the ND. It assumes direct distance from a/c position to the TO WPT and current ground speed.



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As a general rule, the ND indicates what the aircraft will fly with the current active FG modes.

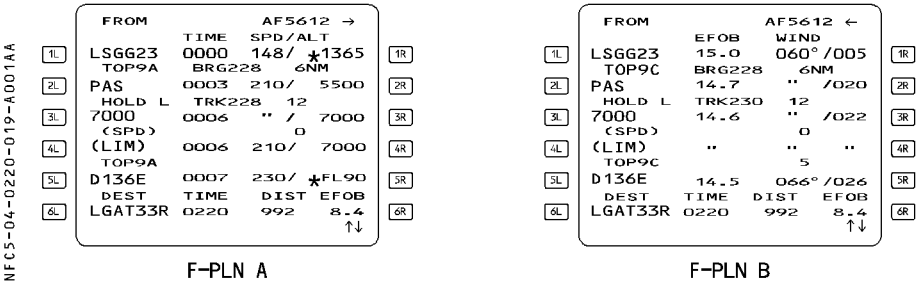
For example :

- The continuous green line on the ND represents the track the aircraft is currently flying :
  - If HDG/TRK is engaged, the track line is green and the flight plan is dashed.
  - If NAV mode is engaged, the green line is the flight plan.
- If the speed target is manually selected, the speed-change symbol is no longer displayed because it will not be taken into account.
- When the aircraft is not following the vertical flight plan (OPCLB, OPDES, V/S) but the NAV mode is engaged, the system disregards any altitude constraints and puts white circles around the waypoints that have these constraints and positions level symbols accordingly.
- Pseudo waypoints are adjusted each time predictions are updated.

PREDICTIONS DISPLAYED ON THE MCDU

The predictions displayed on the MCDU assume that AP (or FD order) is controlling the aircraft and flying it along the preplanned lateral and vertical flight plan.
Therefore :

- If the aircraft is guided along the flight plan (managed guidance), the MCDU predictions correspond exactly to what the aircraft is doing.
- If the aircraft is not guided along the flight plan (selected guidance), the MCDU predictions assume that it will return immediately to the flight plan, intercepting at a predetermined angle, and will then proceed under managed guidance.
- If the aircraft does not fly the managed speed profile (ECON, SPD CSTR ...), the MCDU predictions assume that it will remain at the present selected speed/Mach until it reaches the next SPD CSTR or SPD LIM or enters the next flight phase.



TYPE OF PREDICTIONS

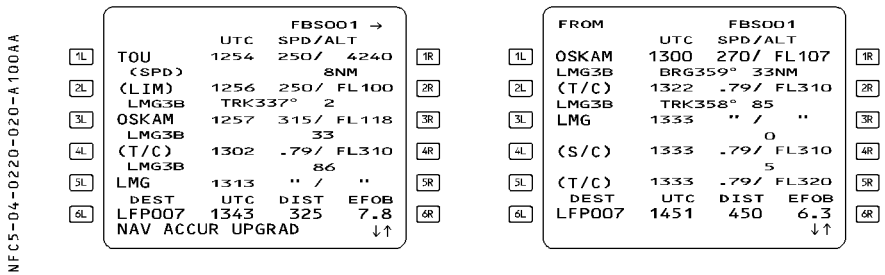
	MCDU PAGE :
Pseudo-waypoints : T/C, T/D, S/C, S/D, I/P, SPD LIM, DECEL	F-PLN A and B
TIME / SPD / ALT at each WPT and pseudo-WPT	F-PLN A
ETA / DIST TO DEST along F-PLN / EFOB at destination	F-PLN A and B
EFOB / T-WIND at each WPT and pseudo-WPT	F-PLN B
Constraint symbol * at each constrained WPT (TIME / SPD / ALT)	F-PLN A and B
Altitude error in case of missed ALT constraint	VERT REV
EFOB / EXTRA FUEL at each WPT	VERT REV
TIME / EFOB at destination	FUEL PRED / PERF CLB / CRZ / DES
TIME / DIST to a selected altitude	PERF CLB or DES
Fuel prediction prior engine start	INIT B
REC MAX FL	PROG
TIME / EFOB at Alternate	FUEL PRED
XTRA FUEL for various Alternates	ALTN
VDEV vertical deviation from vertical flight path	PROG

EXAMPLES OF MCDU PREDICTIONS

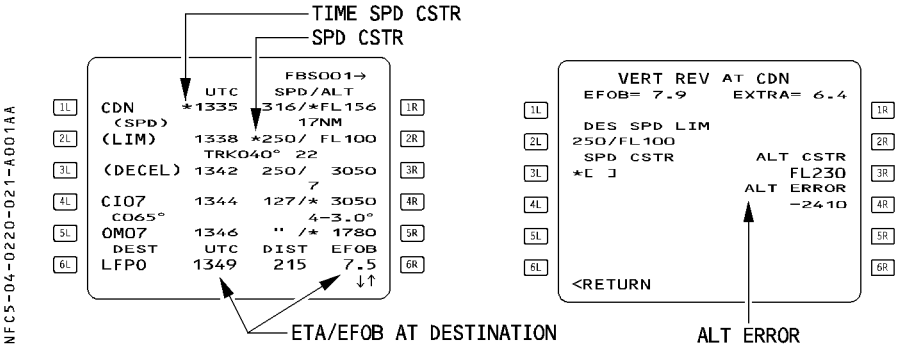
The following MCDU pages display some of the prediction types.

Pseudo-waypoints :
Top of Climb (T/C), Top-of-Descent (T/D), Start of Climb (S/C), or Start of Descent (S/D) for Step Climb/Descent, Speed Limit (SPD LIM), deceleration to approach phase (DECEL).

Time, speed, and altitude predictions
TIME/SPD/ALT for all waypoints and pseudo-waypoints.

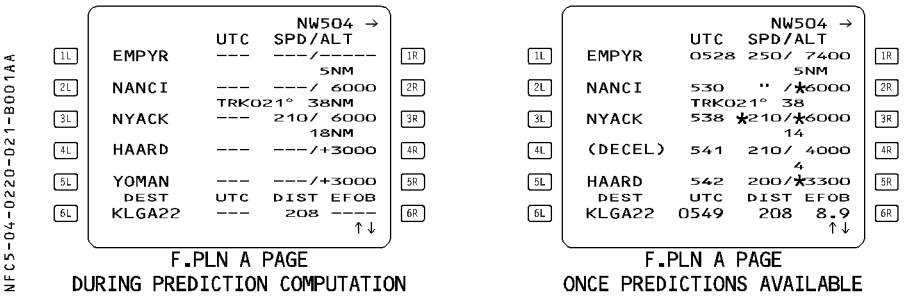


NFC5-04-0220-020-A100AA



CONSTRAINT SYMBOLS (star)

When a time speed or an altitude constraint is part of the vertical flight plan, it appears on F-PLN A page only at the time of insertion or while predictions are not yet available.
Once available, time speed and altitude predictions are displayed for all F-PLN waypoints: when a speed or an altitude constraint is in effect at a waypoint, a star symbol appears adjacent to the speed or altitude prediction. If the star is magenta the constraint is predicted to be matched. If the star is amber, the constraint is predicted to be missed.

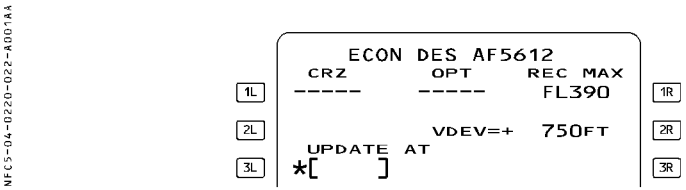


Note : If an altitude constraint is predicted as missed, the system tells you what will be the error at the specific waypoint.

VERTICAL DEVIATION

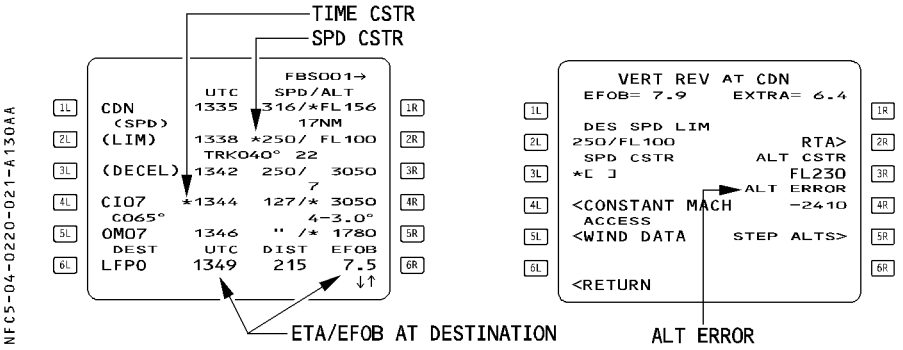
During descent, the system indicates, how far you are from the computed descent profile (PFD and MCDU) and predicts where you may rejoin it. VDEV on the PFD and PROG page, predictions on MCDU F-PLN page, symbols on the ND display, enable assess to the vertical position versus the computed flight profile.

R
R



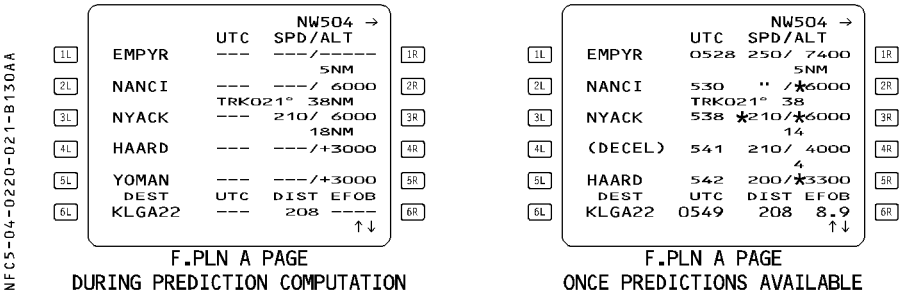
OPERATION RULES CONCERNING PREDICTIONS

- The pilot must properly update the flight plan data during the flight, in order to obtain accurate and meaningful predictions.
- The pilot should rely on the navigation display for short-term predictions. It indicates what the aircraft will do under the currently engaged modes (selected or managed).
- The pilot should rely on the MCDU for long-term predictions, when managed guidance is active or about to be reengaged.



CONSTRAINT SYMBOLS (star)

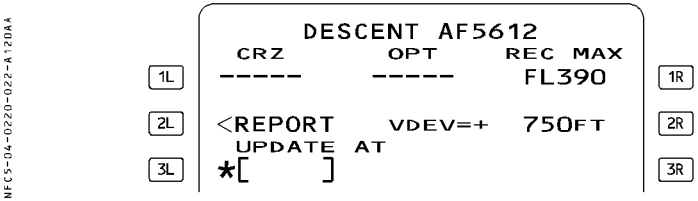
When a time speed or an altitude constraint is part of the vertical flight plan, it appears on the F-PLN A page only at the time of insertion, or when predictions are not yet available. Once available, the time speed and altitude predictions are displayed for all F-PLN waypoints : When a speed or an altitude constraint is at a waypoint, a star symbol appears adjacent to the speed or altitude prediction. If the star is magenta, the constraint is predicted to be matched. If the star is amber, the constraint is predicted to be missed.



Note : If an altitude constraint is predicted as missed at a waypoint, the predicted altitude error is displayed on the VERT REV page of this waypoint.

VERTICAL DEVIATION

During descent, the system tells you how far you are from the computed descent profile (PFD and MCDU) and predicts where you may rejoin it. VDEV on the PFD and PROG page, predictions on the MCDU F-PLN page, symbols on the ND display, enable assess to the vertical position versus the computed flight profile.



NEOS-04-0220-022-A120A

OPERATION RULES CONCERNING PREDICTIONS

- The pilot must properly update the flight plan data during the flight, in order to obtain accurate and meaningful predictions.
- The pilot should rely on the navigation display for short-term predictions. It indicates what the aircraft will do under the currently engaged modes (selected or managed).
- The pilot should rely on the MCDU for long-term predictions, when managed guidance is active or about to be reengaged.

MANAGED TARGETS

When the aircraft is using managed targets, the flight management and guidance system (FMGS) guides it along lateral and vertical flight paths and speed profiles computed by the flight management function (FM) from data in the MCDU.
FM manages the guidance targets.

SELECTED TARGETS

When the pilot is using selected targets, the FMGS guides the aircraft along lateral and vertical flight paths and speed profiles to meet targets that the pilot has selected manually on the FCU.
The pilot selects the guidance targets.

MODE REVERSIONS

All mode reversions are how described in FCOM volume 1 (1.22.30).

FLIGHT GUIDANCE MODES

Lateral and vertical modes may be :
– armed
– engaged
– disengaged
Autothrust modes may be :
– armed
– active
– disconnected

LATERAL MODES

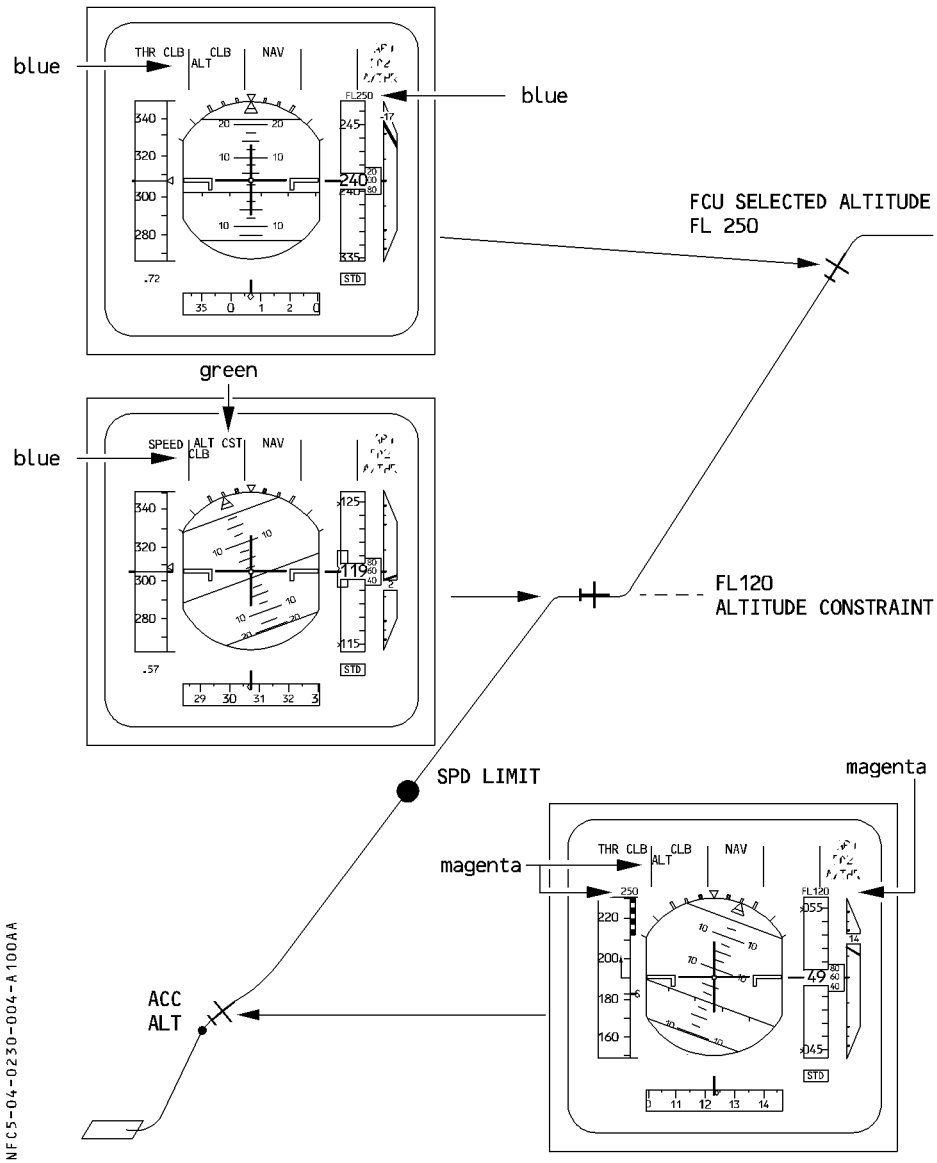
R

MODE	TYPE	GUIDANCE	REMARK
RWY	MANAGED	Mode used at takeoff to guide the aircraft along the runway centerline, using LOC.	Triggered by the thrust levers at FLX or TOGA position.
RWY TRK	MANAGED	Mode used to guide the aircraft along the track the aircraft was following at mode engagement.	
NAV	MANAGED	Mode used to guide the aircraft along the lateral F-PLN. Available above 30 feet after takeoff.	Automatically armed at takeoff, unless HDG/TRK is preset. In that case, RWY TRK engages after takeoff.
HDG-TRK	SELECTED	Mode used to guide the aircraft on a heading or a track selected by the crew. The target value is displayed in the FCU window.	*Note : HDG/TRK is called "basic mode" because it is a backup mode for certain situations :* *– F-PLN discontinuity entry.* *– AP engagement with no FD.* *– Loss of F-PLN.*
LOC* LOC APP NAV	MANAGED	Mode used to guide the aircraft on the lateral approach path (LOC or F-PLN approach path).	Selected by pressing APPR pb on the FCU ; the mode that engages depends upon the selected approach in the F-PLN. *Note : For LOC only approach, do not select the FCU's APPR pushbutton, but rather the LOC pushbutton.*
LAND	MANAGED	Common mode engaged below 400 ft RA during an automatic ILS approach.	Engaged, only if LOC mode and G/S mode are already engaged.
GA TRK	MANAGED	Mode used to guide the aircraft along the track the aircraft was following at mode engagement.	Triggered by the thrust levers at TOGA with Slats/Flaps in, at least, CONF 1.
ROLL OUT	MANAGED	Mode used to guide the aircraft on the runway, following an automatic landing.	FD rollout symbol is displayed on the PFD at touchdown.

VERTICAL MODES

MODE	TYPE	GUIDANCE	REMARK
SRS	MANAGED	Mode used at takeoff, or Go-Around to maintain SRS speed (V2, V2+10, VAPP ...).	Triggered by the thrust levers at FLX or TOGA position. Automatically disengages at ACC ALT, or when another VERT mode is engaged.
CLB	MANAGED	Mode used to climb towards FCU SEL ALT along VERT F-PLN taking into account ALT CSTR. Available only if NAV engaged. The A/THR is in THRUST mode (CLB).	The speed target may either be selected or managed. If managed, SPD CSTR, SPD LIM, and HOLD SPD are taken into account. ALT mode is always armed ; displayed in magenta, if the next level off is predicted at an ALT CSTR ; and in blue, if the next level off is predicted at the FCU-selected altitude.
DES	MANAGED	Mode used to descend towards FCU SEL ALT along the computed descent path, taking into account ALT CSTR. Available, only if NAV engaged. The A/THR may be in THRUST, or SPD mode.	
OPEN CLB OPEN DES	SELECTED	Mode used to climb/descend directly to the FCU-selected ALT. These modes disregard all ALT CSTR. The A/THR is in THRUST mode (CLB/IDLE)	The speed target may either be selected or managed. ALT mode is systematically armed and blue. Altitude target is blue on PFD.
EXPEDITE ◁	SELECTED	Mode used to increase the vertical speed by selecting green dot in climb or .80/340 KT in descent.	Used to expedite a climb or a descent towards a specific level.
ALT CSTR* ALT CSTR	MANAGED	Mode automatically engaged when reaching an ALT CSTR before the FCU SEL ALT.	CLB/DES mode are systematically armed (blue).
ALT* ALT ALT CRZ	SELECTED	Mode used to maintain a level flight at the FCU-selected altitude.	Soft ALT mode engages, when FCU selected altitude = CRZ FL. Soft ALT is part of the managed guidance.
V/S-FPA	SELECTED	Mode used to guide the a/c along a vertical speed, or a selected flight path angle.	Altitude target is blue on PFD. V/S-FPA is a basic mode. (Refer to HDG/TRK remark).
GS* G/S FINAL	MANAGED	Mode used to guide the a/c along the final approach path (GS or non ILS)	Selected by pressing the FCU's APPR pb. The mode engaged depends upon the selected approach in the F-PLN. Linked to APPR common mode (APPR pb).
FLARE	MANAGED	Common mode which provides alignment to the runway centerline on the yaw axis, and flare on the pitch axis.	Engages below 50 ft RA, based on the current vertical speed.

CLIMB MODE

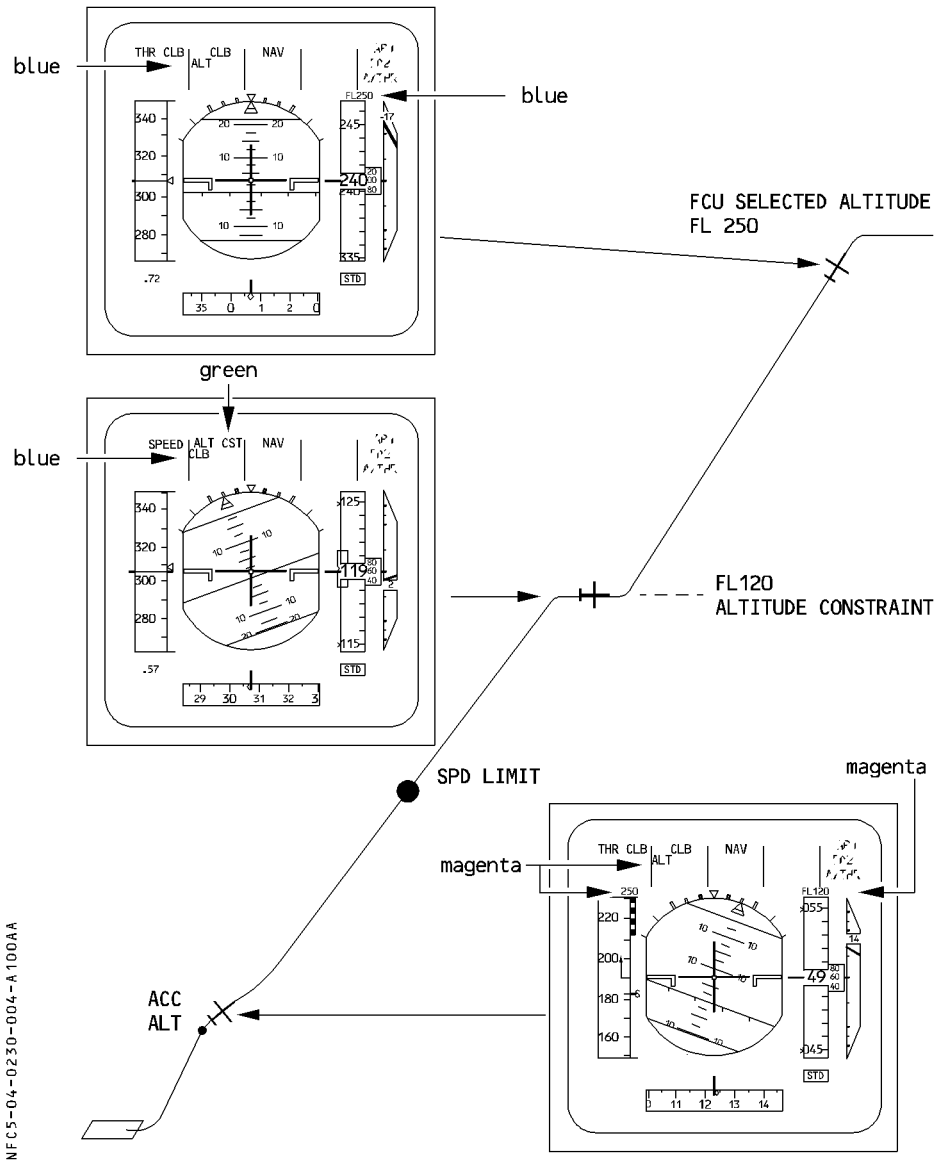

blue
THR CLB
CLB
ALT
NAV
blue
FCU SELECTED ALTITUDE
FL 250
green
blue
SPEED
ALT CST
CLB
NAV
FL120
ALTITUDE CONSTRAINT
SPD LIMIT
magenta
magenta
THR CLB
CLB
ALT
NAV
ACC
ALT
NFC5-04-0230-004-A100AA

VERTICAL MODES

R

MODE	TYPE	GUIDANCE	REMARK
SRS	MANAGED	Mode used at takeoff, or Go-Around to maintain SRS speed (V2, V2+10, VAPP ...).	Triggered by the thrust levers at FLX or TOGA position. Automatically disengages at ACC ALT (at takeoff only), or when another VERT mode is engaged.
CLB	MANAGED	Mode used to climb towards FCU SEL ALT along VERT F-PLN taking into account ALT CSTR. Available only if NAV engaged. The A/THR is in THRUST mode (CLB).	The speed target may either be selected or managed. If managed, SPD CSTR, SPD LIM, and HOLD SPD are taken into account. ALT mode is always armed ; displayed in magenta, if the next level off is predicted at an ALT CSTR ; and in blue, if the next level off is predicted at the FCU-selected altitude.
DES	MANAGED	Mode used to descend towards FCU SEL ALT along the computed descent path, taking into account ALT CSTR. Availabl, only if NAV engaged. The A/THR may be in THRUST, or SPD mode.	
OPEN CLB OPEN DES	SELECTED	Mode used to climb/descend directly to the FCU-selected ALT. These modes disregard all ALT CSTR. The A/THR is in THRUST mode (CLB/IDLE)	The speed target may either be selected or managed. ALT mode is systematically armed and blue. Altitude target is blue on PFD.
EXPEDITE ◁	SELECTED	Mode used to increase the vertical speed by selecting green dot in climb or .80/340 KT in descent.	Used to expedite a climb or a descent towards a specific level.
ALT CSTR ALT CSTR*	MANAGED	Mode automatically engaged when reaching an ALT CSTR before the FCU SEL ALT.	CLB/DES mode are systematically armed (blue).
ALT* ALT ALT CRZ	SELECTED	Mode used to maintain a level flight at the FCU-selected altitude.	Soft ALT mode engages, when FCU selected altitude = CRZ FL. Soft ALT is part of the managed guidance.
V/S-FPA	SELECTED	Mode used to guide the a/c along a vertical speed, or a selected flight path angle.	Altitude target is blue on PFD. V/S-FPA is a basic mode. (Refer to HDG/TRK remark).
GS* G/S FINAL	MANAGED	Mode used to guide the a/c along the final approach path (GS or non ILS)	Selected by pressing the FCU's APPR pb. The mode engaged depends upon the selected approach in the F-PLN. Linked to APPR common mode (APPR pb).
FLARE	MANAGED	Common mode which provides alignment to the runway centerline on the yaw axis, and the flare on the pitch axis.	Engages below 50 ft RA, based on the current vertical speed.

CLIMB MODE


blue
THR CLB
CLB
ALT
NAV
blue
FCU SELECTED ALTITUDE
FL 250
green
blue
SPEED
ALT CST
CLB
NAV
FL120
ALTITUDE CONSTRAINT
SPD LIMIT
magenta
magenta
THR CLB
CLB
ALT
NAV
ACC
ALT
NFC5-04-0230-004-A100AA

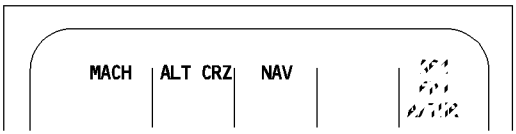
When CLIMB mode is engaged (always associated with lateral NAV mode), the system takes into account all constraints defined by the database or manually entered by the crew. Nevertheless this mode has the following particularity :
When the aircraft is in CLB mode and the system predicts that it will miss an altitude constraint, it will not modify the target speed in an attempt to meet it.
In this case, the pilot may select an appropriate speed in order to meet the ALT CSTR.

SPECIFIC MODES IN CRUISE PHASE

· SOFT ALTITUDE MODE (CRUISE)

The soft altitude mode engages when the aircraft reaches the FCU altitude set as the cruise flight level (entered in the F-PLN or on PROG page).
The soft altitude mode corrects minor deviations from the Mach target by allowing a ± 50-foot variation from the CRZ FL. This feature improves fuel efficiency and passenger comfort and minimizes the changes in thrust.

NFC5-04-0230-005-A100AA



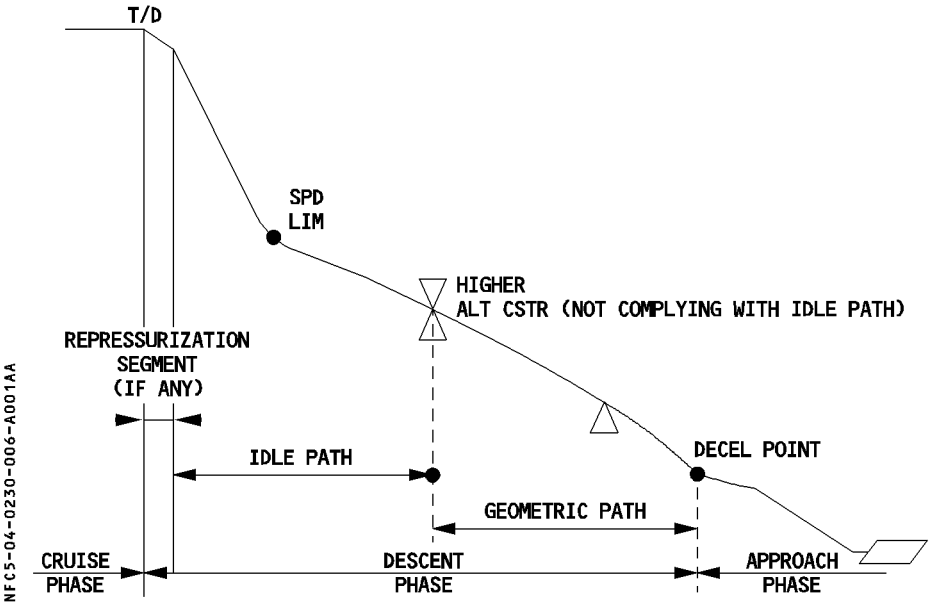
Typical FMA in CRZ with soft altitude mode engaged

· STEP CLB or STEP DES

The pilot inserts a step when he is planning to change the cruise flight level. The system responds by displaying predictions for the new situation.
If the pilot inserts a step at a waypoint, the system displays a start-of-climb or descent (S/C or S/D) pseudo waypoint on the ND and the MCDU.
The flight crew can insert only one step at a time. (It can insert a second step only after the aircraft has executed the first one).

DES MODE

The DES mode guides the aircraft along the descent path computed by the FMGS.
The system computes this flight path backwards from the deceleration point up to the top of descent (T/D) with respect to the speed and altitude constraints .
Internally, the computer divides the descent path into various segments, depending on the relative positions of the constraints. It starts at top of descent (T/D) by setting up an "idle" segment that takes the aircraft down to the first constraint, and follows this with "geometric" segments between constraints.



REPRESSURIZATION SEGMENT

The top of descent (T/D) may be updated if the pilot modifies the cabin rate of descent (default rate is – 350 feet/minute).
If the flight crew enters a lower cabin rate, the system computes a repressurization segment that takes into account the additional time needed for repressurization.

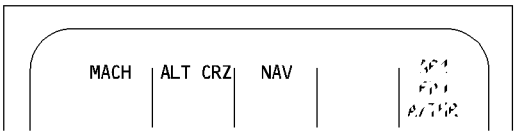
When CLIMB mode is engaged (always associated with lateral NAV mode), the system takes into account all constraints defined by the database, or manually entered by the crew. Nevertheless, this mode has the following particularity :
When, the aircraft is in CLB mode, and the system predicts that it will miss an altitude constraint, it will not modify the target speed in an attempt to meet it.
In this case, the pilot may select an appropriate speed in order to meet the ALT CSTR.

SPECIFIC MODES IN CRUISE PHASE

· SOFT ALTITUDE MODE (CRUISE)

The soft altitude mode engages, when the aircraft reaches the FCU altitude set as the cruise flight level (entered on the PROG page).
The soft altitude mode corrects minor deviations from the Mach target by allowing a ± 50-foot variation from the CRZ FL. This feature improves fuel efficiency and passenger comfort and minimizes thrust changes.

NFCS-04-0230-005-A110AA



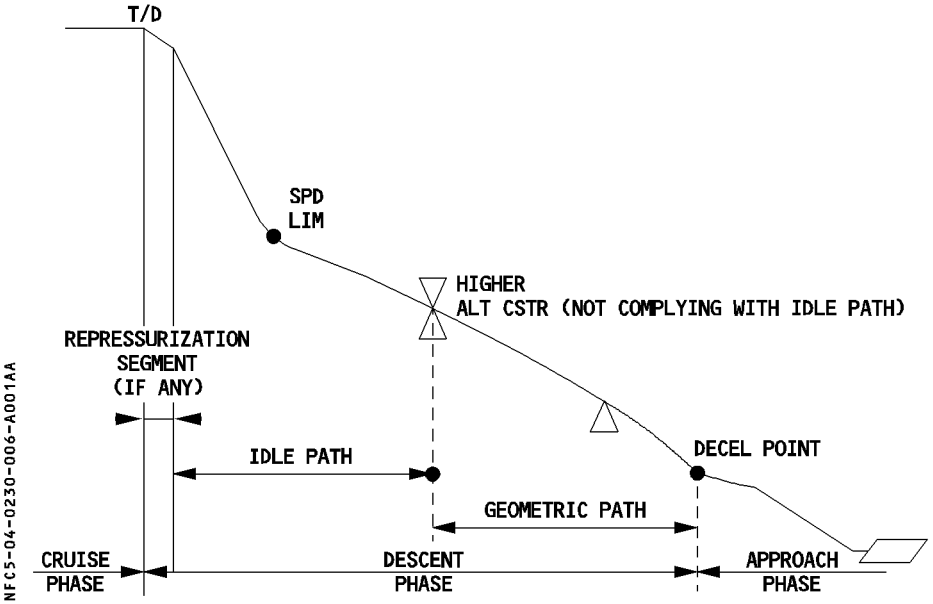
Typical FMA in CRZ with soft altitude mode engaged

· STEP CLB or STEP DES

The pilot inserts a step when he is planning to change the cruise flight level. The system responds by displaying predictions for the new situation.
If the pilot inserts an optimum or geographic step to an altitude, the system displays a start-of-climb or descent (S/C or S/D) pseudo-waypoint on the ND and the MCDU.
The minimum step size is 1000 feet.
The STEP automatically reassigns the new CRZ FL, and the SOFT ALT mode re-engages when reaching the new altitude.

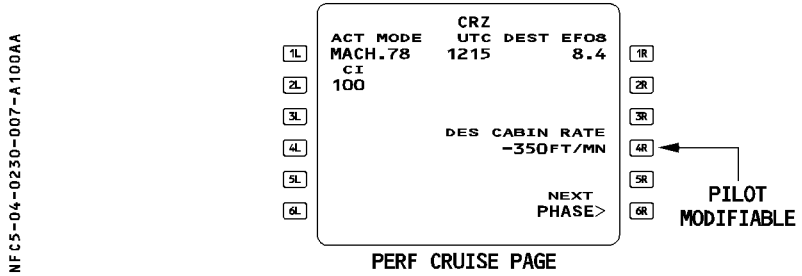
DES MODE

The DES mode guides the aircraft along the descent path computed by the FMGS.
The system computes this flight path backwards from the deceleration point up to the top of descent (T/D) with respect to the speed and altitude constraints .
Internally, the computer divides the descent path into various segments, depending on the relative positions of the constraints. It starts at top of descent (T/D) by setting up an "idle" segment that takes the aircraft down to the first constraint, and follows this with "geometric" segments between constraints.



REPRESSURIZATION SEGMENT

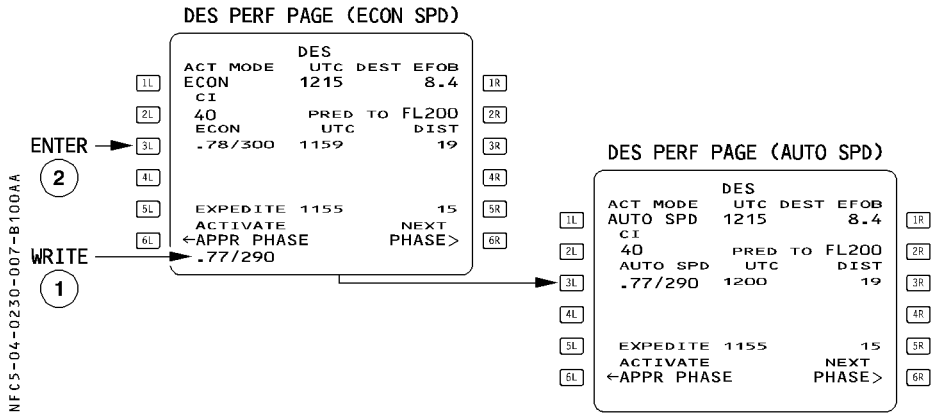
The top of descent (T/D) may be updated if the pilot modifies the cabin rate of descent (default rate is – 350 feet/minute).
If the flight crew enters a lower cabin rate, the system computes a repressurization segment that takes into account the additional time needed for repressurization.



DESCENT SPEED PROFILE

The descent speed profile is usually the ECON SPD profile, amended by any speed constraints and speed limit contained in the flight plan.

R Before the descent phase is active, if the pilot does not intend to fly the ECON speed/Mach
R profile, a different speed or Mach can be entered to amend the speed profile :
This selected speed/Mach is called AUTO SPD. It is obtained by entering a Mach number
R and/or a speed in the ECON field of the PERF DES page (3L key).
R



R If the pilot reverts to the SELECTED speed/MACH mode during descent, the profile is not
R modified and the aircraft flies the same profile at the FCU-selected speed/MACH value.
Basic managed SPD/MACH profile in DES mode is :

* ECON MACH, or AUTO MACH
* ECON SPD, or AUTO SPD
* SPD CSTR (if any)
* SPD LIMIT
* GD/S/F/VAPP
* VAPP TARGET

GUIDANCE IN DES MODE

The aircraft will not begin its descent automatically when reaching the top of descent (T/D). In order to initiate the descent, the pilot will set the clearance altitude then push the ALT selector knob. The aircraft will descend immediately.

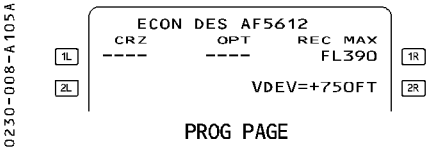
* If the aircraft has not reached the Top of Descent, the aircraft descends at a constant V/S converging on the descent path.
* If the aircraft is at or beyond T/D, it descends at idle thrust.

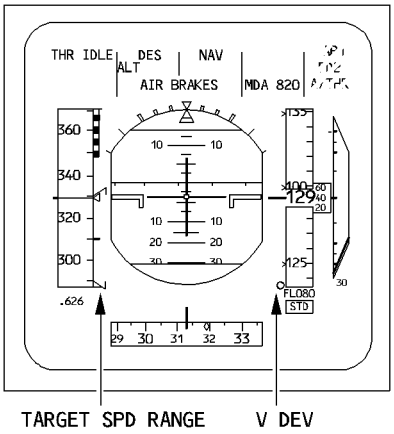
· During the descent :

The pilot will see a vertical deviation symbol (VDEV) along the ALT scale on the PFD and a VDEV value on the PROG page, so that the aircraft's vertical position can be monitored versus the calculated descent profile.

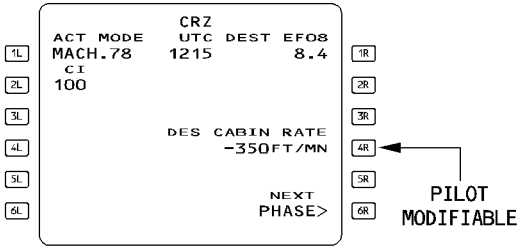
The aircraft may deviate from the DES profile while DES mode is engaged if :

— unexpected wind conditions are encountered.
— anti-icing is turned on.
— the lateral flight plan is changed.





NFC5-04-0230-008-A105AA



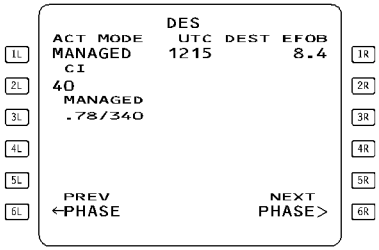
NFC5-04-0230-007-A110AA

PERF CRUISE PAGE

DESCENT SPEED PROFILE

The descent speed profile is usually the ECON speed profile, amended by any speed constraints and speed limit contained in the flight plan.

Before the descent phase is active, if the pilot does not intend to fly the ECON speed/Mach
R profile, a different speed or Mach can be entered to amend the speed profile :
R The pilot may enter a Mach number and/or a speed in the MANAGED field of the PERF DES
R page (3L key).



NFC5-04-0230-007-B110AA

DES PHASE NOT ACTIVE WITH
MANAGED SPEED/MACH SELECTION

R If the pilot reverts to the SELECTED speed/MACH mode during descent, the profile is not
R modified and the aircraft flies the same profile at the FCU-selected speed/MACH value.

Basic MANAGED SPD/MACH profile in DES mode is :

* ECON Mach, or SELECTED Mach
* ECON Speed, or SELECTED Speed
* SPD CSTR (if any)
* SPD LIMIT
* GD/S/F/VAPP
* VAPP TARGET

GUIDANCE IN DES MODE

The aircraft will not begin its descent automatically when reaching the top of descent (T/D). In order to initiate the descent, the pilot will set the clearance altitude then push the ALT selector knob. The aircraft will descend immediately.

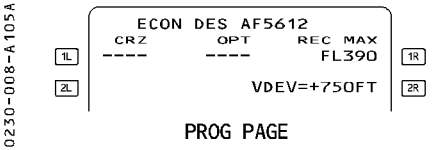
* If the aircraft has not reached the Top of Descent, the aircraft descends at a constant V/S converging on the descent path.
* If the aircraft is at or beyond T/D, it descends at idle thrust.

· During the descent :

The pilot will see a vertical deviation symbol (VDEV) along the ALT scale on the PFD and a VDEV value on the PROG page, so that the aircraft's vertical position can be monitored versus the calculated descent profile.

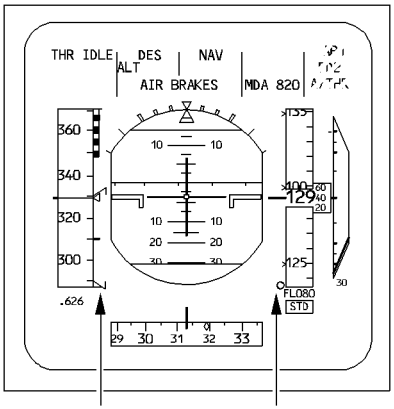
The aircraft may deviate from the DES profile while DES mode is engaged if :

— unexpected wind conditions are encountered.
— anti-icing is turned on.
— the lateral flight plan is changed.

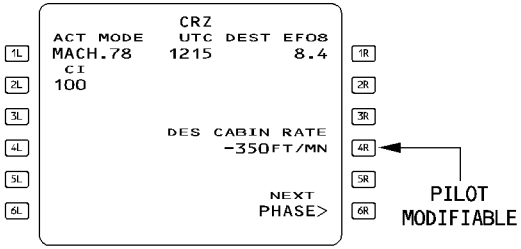


PROG PAGE

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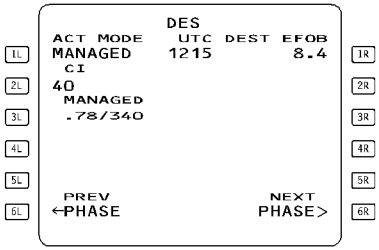
PERF CRUISE PAGE

DESCENT SPEED PROFILE

The descent speed profile is usually the ECON speed profile, amended by any speed constraints and speed limit contained in the flight plan.

Before the descent phase is active, if the pilot does not intend to fly the ECON speed/Mach
R profile, a different speed or Mach can be entered to amend the speed profile :
R The pilot may enter a Mach number and/or a speed in the MANAGED field of the PERF DES
R page (3L key).

NFC5-04-0230-007-B110AA



DES PHASE NOT ACTIVE WITH
MANAGED SPEED/MACH SELECTION

R If the pilot reverts to the SELECTED speed/MACH mode during descent, the profile is not
R modified and the aircraft flies the same profile at the FCU-selected speed/MACH value.

Basic MANAGED SPD/MACH profile in DES mode is :

* ECON Mach, or SELECTED Mach
* ECON Speed, or SELECTED Speed
* SPD CSTR (if any)
* SPD LIMIT
* GD/S/F/VAPP
* VAPP TARGET

GUIDANCE IN DES MODE

The aircraft will not automatically begin its descent when reaching the Top of Descent (T/D).

In order to initiate the descent, the pilot will set the clearance altitude, then push the ALT selector knob. The aircraft will descend immediately.

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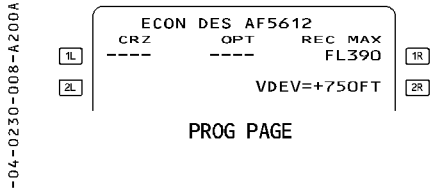
· During the descent :

The pilot will see a vertical deviation symbol (VDEV) along the PFD's ALT scale, and a VDEV value on the PROG page, so that the aircraft's vertical position can be monitored versus the calculated descent profile.

The aircraft may deviate from the DES profile, while DES mode is engaged, if :

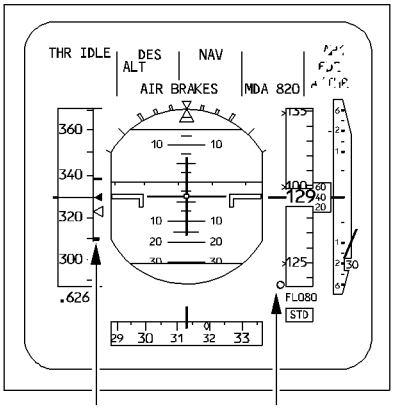
— Unexpected wind conditions are encountered.
— Anti-icing is turned on.
— The lateral flight plan is changed.

R



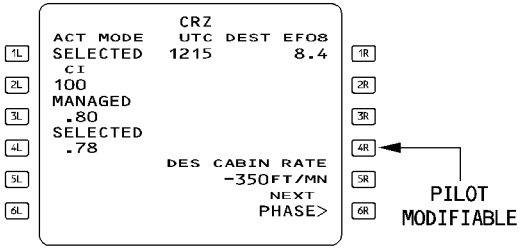
PROG PAGE

NFCS-04-0230-008-A00AA



TARGET SPD RANGE V DEV

R

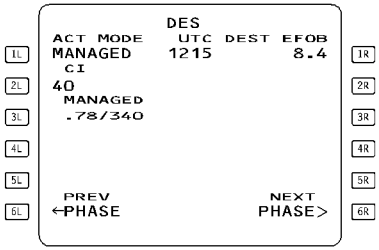


PERF CRUISE PAGE

NFC5-04-0230-007-A120AA

DESCENT SPEED PROFILE

The descent speed profile is usually the ECON speed profile, amended by any speed constraints and speed limit contained in the flight plan.
Before the descent phase is active, if a pilot does not intend to fly the ECON speed/Mach profile, a different speed or Mach can be entered to amend the speed profile.
The pilot may enter a MACH number and/or a speed in the MANAGED field of the PERF DES page. (3L key).



DES PHASE NOT ACTIVE WITH
MANAGED SPEED/MACH SELECTION

NFC5-04-0230-007-B120AA

If the pilot reverts to the SELECTED Speed/Mach mode during descent, the profile is not modified and the aircraft flies the same profile at the FCU-selected Speed/Mach.
Basic MANAGED SPD/MACH profile in DES mode is :

* ECON Mach, or SELECTED Mach
* ECON Speed, or SELECTED Speed
* SPD CSTR (if any)
* SPD LIMIT
* GD/S/F/VAPP
* VAPP TARGET

GUIDANCE IN DES MODE

The aircraft will not automatically begin its descent when reaching the Top of Descent (T/D).

In order to initiate the descent, the pilot will set the clearance altitude, then push the ALT selector knob. The aircraft will descend immediately.

* If the aircraft has not reached the Top of Descent, the aircraft descends at a constant V/S converging on the descent path.
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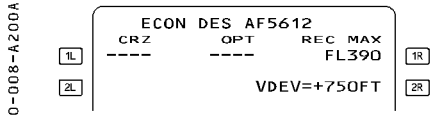
· During the descent :

The pilot will see a vertical deviation symbol (VDEV) along the PFD's ALT scale, and a VDEV value on the PROG page, so that the aircraft's vertical position can be monitored versus the calculated descent profile.

The aircraft may deviate from the DES profile, while DES mode is engaged, if :

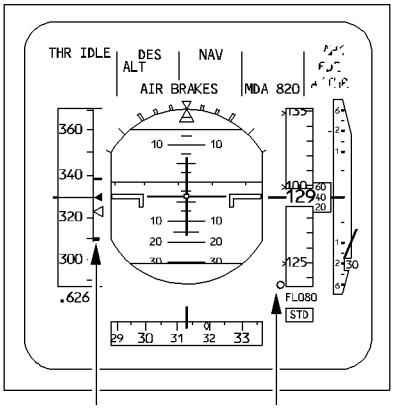
— Unexpected wind conditions are encountered.
— Anti-icing is turned on.
— The lateral flight plan is changed.

R



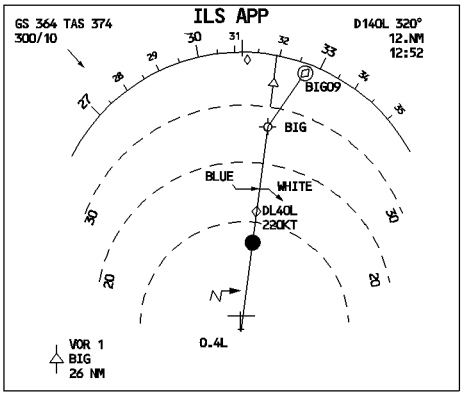
PROG PAGE

NFCS-04-0230-008-A00AA



TARGET SPD RANGE V DEV

- When the speed is managed, a target speed range displayed on the PFD defines acceptable speed variations around the nominal descent speed target.
  - If the aircraft is above the descent profile, the speed increases toward the upper limit of the target speed range as the aircraft converges on the descent profile. If this does not increase the descent angle enough, the aircraft deviates from the descent profile. (A/THR is at IDLE).
  - If the aircraft is below the descent profile, the aircraft maintains the target speed until it reaches the vertical profile. The lower margin becomes effective when the aircraft is on the descent profile but has to lose speed in order to stay on it.
- The ND shows an intercept symbol ∿↦ that indicates the position where the system predicts that the aircraft will be back on the descent profile. When the aircraft is above the descent profile, the prediction is based on the assumption that the pilot will extend half speedbrakes. If necessary, the message "AIRBRAKES" (old FMGC standard) or "MORE DRAG" comes up on the PFD and the MCDU, and remains there as long as more drag (speedbrakes) is still required. The pilot should respond to this message by deploying half speedbrakes.



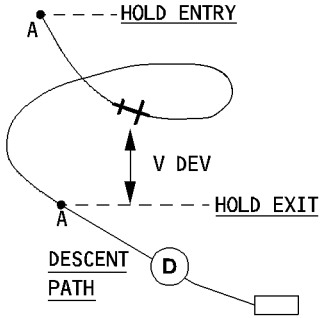
NFC5-04-0230-009-A001AA

Note : With DES mode engaged, extending the speedbrakes does not necessarily increase the descent rate. It does so only if the aircraft is above profile.

- **When in a holding pattern**

The DES mode commands V/S = – 1000 feet/minute while A/THR maintains the holding speed. The current VDEV is the vertical deviation from the altitude at which FM predicts the aircraft will be when it reaches the exit fix.

Until the pilot exits the hold, the FMGS in DES mode will maintain V/S = – 1000 feet/minute considering downpath vertical constraint. This means that the aircraft will
R not descent below the next altitude constraint, neither the FCU selected altitude. If the aircraft reaches the next altitude constraint it will level off and ALT CSTR mode will engage.



NFC5-04-0230-010-A001AA

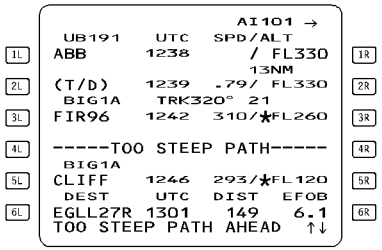
- **Too steep path**

A descent segment is called “too steep path” when FM predicts that the descent segment between two constraint waypoints is impossible to fly at the planned descent speed with 1/2 speedbrakes extended.

When this occurs :

The MCDU displays no predictions between the upper and the lower points of the too steep path.

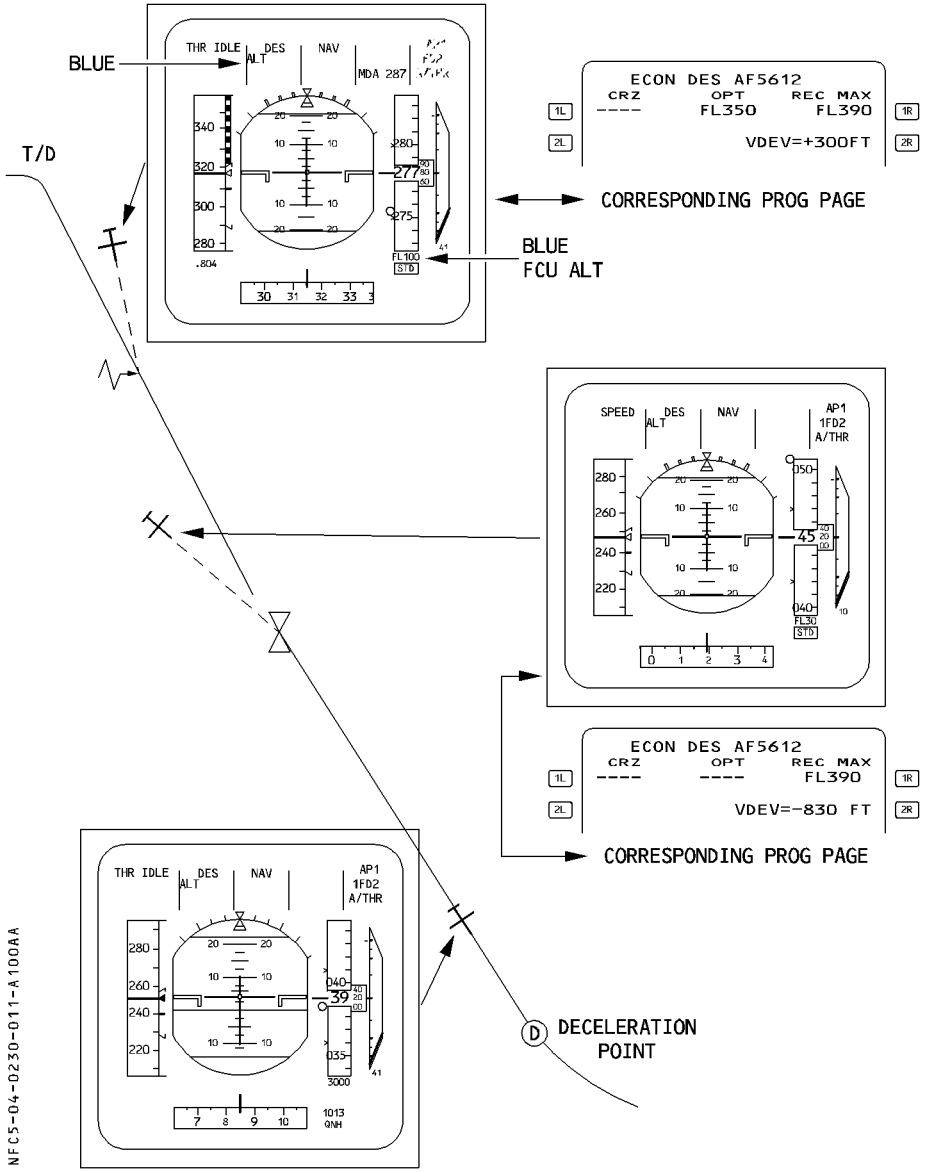
Relevant message “TOO STEEP PATH” is displayed on MCDU.



NO PREDICTIONS BETWEEN THE UPPER AND LOWER POINTS

NFC5-04-0230-010-B001AA

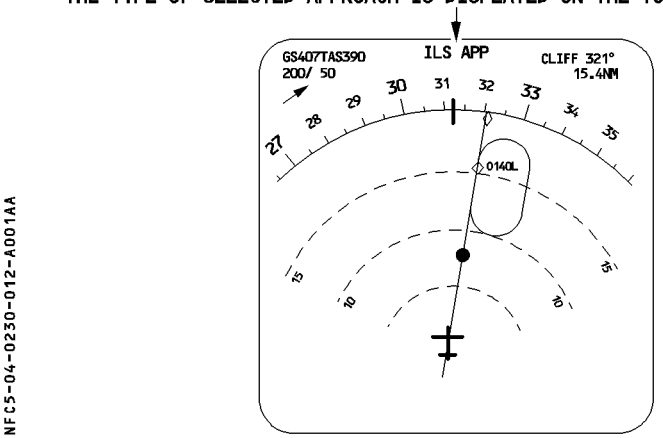
DES MODE PROFILE



APPROACH MODES

R The aircraft can fly different types of approaches :
R — Precision approaches : ILS, MLS.
R — Non-precision approaches : VOR/DME, VOR, NDB (if ADF installed), RNAV.
R — Non-precision approaches using a Localizer only : LOC, LOC B/C.
R The crew uses an ARRIVAL lateral revision to insert these approaches into the flight plan.
R For precision approaches, the crew uses the APPR pushbutton on the FCU to arm or R engage the guidance modes LOC and G/S.
R For non-precision approaches, the crew uses the APPR pushbutton on the FCU to arm or R engage the guidance modes APP NAV and FINAL, except for LOC and LOC B/C approaches, R where the crew only uses the LOC pushbutton to arm or engage the LOC mode.

THE TYPE OF SELECTED APPROACH IS DISPLAYED ON THE TOP SIDE OF THE ND

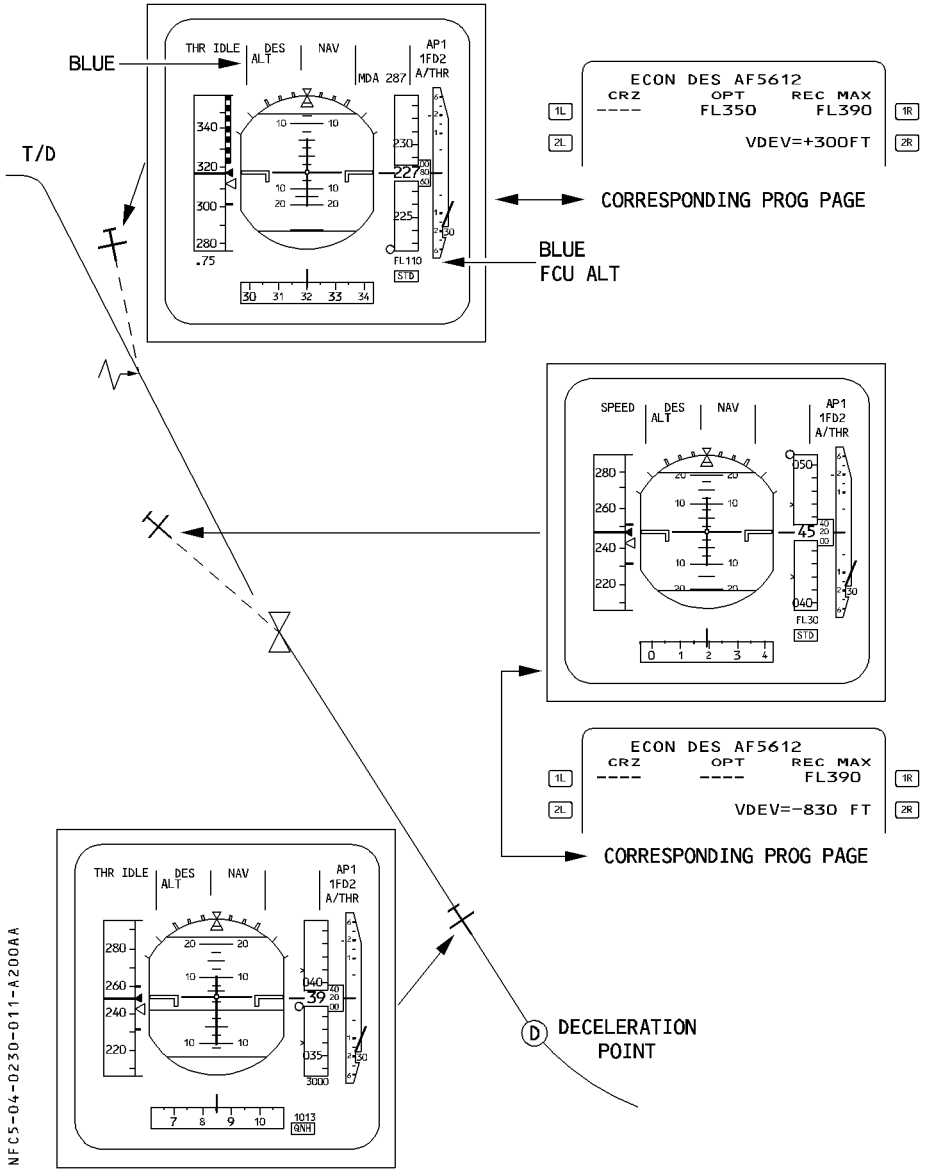


NFCS-04-0230-012-A001AA

APP NAV - FINAL MODES

When a non precision approach is selected in the active flight plan, and the APPR pushbutton is pressed, APP NAV and FINAL will arm.
If NAV mode was currently engaged, APP NAV mode engages immediately.
FINAL mode will engage when, APP NAV being engaged, the aircraft trajectory intercepts the non precision flight profile (usually a descending leg).
(Refer to FCOM 1.22.30) “NON PRECISION APPROACH mode”.

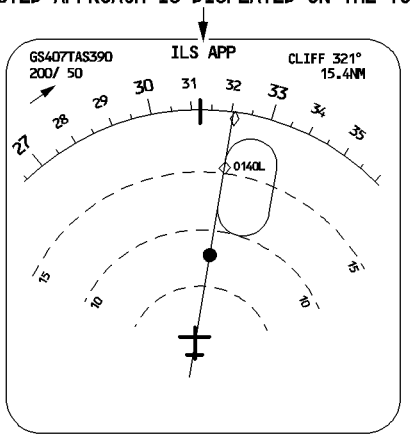
DES MODE PROFILE



APPROACH MODES

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R The crew uses an ARRIVAL lateral revision to insert these approaches into the flight plan.
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R engage the guidance modes LOC and G/S.
R For non-precision approaches, the crew uses the APPR pushbutton on the FCU to arm or
R engage the guidance modes APP NAV and FINAL, except for LOC and LOC B/C approaches,
R where the crew only uses the LOC pushbutton to arm or engage the LOC mode.

THE TYPE OF SELECTED APPROACH IS DISPLAYED ON THE TOP SIDE OF THE ND



NFCS-04-0230-012-A001AA

APP NAV - FINAL MODES

When a non precision approach is selected in the active flight plan, and the APPR pushbutton is pressed, APP NAV and FINAL will arm.
If NAV mode was currently engaged, APP NAV mode engages immediately.
FINAL mode will engage when, APP NAV being engaged, the aircraft trajectory intercepts the non precision flight profile (usually a descending leg).
(Refer to FCOM 1.22.30) “NON PRECISION APPROACH mode”.

FLIGHT MODE ANNUNCIATOR (FMA)

The purpose of the FMA is to display the guidance modes of the aircraft. The FMA shows the A/THR and AP/FD modes, as well as the engagement status of these systems and their ILS approach capabilities.
The AP/FD and A/THR use only the guidance modes displayed on the first line.

· **The first line displays :**
* A/THR and AP/FD engaged modes in green
* Landing capability in white (CAT 1, CAT 2, CAT 3 DUAL or CAT3 SINGLE)
* AP engagement (AP1, AP2 or AP1 + 2) in white

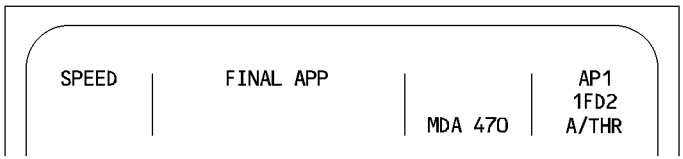
R *Note : CAT1 is the lowest capability displayed in that field.*
R *CAT1 covers different requirements including raw data.*

· **The second line displays :**
* Armed mode in blue except ALT mode when it is armed because of an altitude constraint (magenta).
* Preset speed or Mach when it is selected by the crew.
* FD engagement in white. (1FD2 ...).

· **The third line displays :**
* MDA/MDH or DH/NO DH in blue followed by the value entered manually by the pilot.
* A/THR status in white when active, in blue when armed.
* Operational messages

For a detailed description of all indications displayed on the FMAs. (Refer to 1.22.30).

NFCS-04-0230-013-A100AA



TYPICAL FMA DURING NON PRECISION APPROACH

– Both FMAs are driven by the master FMGC
– Each new annunciation is boxed for 10 seconds.
For a detailed description of the FMAs. (Refer to 1.22.30).

03.00 CONTENTS

03.10 INTERFACE VIEWS

– MCDU . . . . . P 1
– FLIGHT CONTROL UNIT (FCU) AND AUTOLAND LIGHT . . . P 2
– THRUST LEVERS . . . . . P 3
– PRIMARY FLIGHT DISPLAY (PFD) . . . . . P 4
– NAVIGATION DISPLAY (ND) . . . . . P 5

03.20 MCDU PAGES DESCRIPTION

– GENERAL . . . . . P 1
– MCDU MENU PAGE . . . . . P 2
– INIT A PAGE . . . . . P 3
– ROUTE SELECTION PAGE . . . . . P 6
– WIND PAGES . . . . . P 8
– INIT B PAGE . . . . . P 12
– FUEL PREDICTION PAGE . . . . . P 14
– FLIGHT PLAN PAGES . . . . . P 16
– LATERAL REVISION PAGES . . . . . P 20
– DEPARTURE PAGES . . . . . P 22
– HOLD PAGES . . . . . P 24
– DIRECT TO PAGE . . . . . P 27
– ARRIVAL PAGES . . . . . P 28
– ALTERNATE PAGE . . . . . P 30
– ROUTE SELECTION PAGE FOR ALTERNATE . . . . . P 31
– VERTICAL REVISION PAGES . . . . . P 32
– STEP PRED PAGE . . . . . P 35
– DATA INDEX PAGE . . . . . P 36
– WAYPOINT/STORED WAYPOINT/NEW WAYPOINT PAGES . . P 38
– NAVAID/STORED NAVAID/NEW NAVAID PAGES . . . . . P 40
– RUNWAY/STORED RUNWAY/NEW RUNWAY PAGES . . . . . P 44
– ROUTE/STORED ROUTE/NEW ROUTE PAGES . . . . . P 47
– AIRCRAFT STATUS PAGE . . . . . P 50
– DUPLICATE NAMES PAGE . . . . . P 51
– POSITION MONITOR PAGE . . . . . P 52
– SELECTED NAVAIDS PAGE . . . . . P 53

03.20 MCDU PAGES DESCRIPTION (cond't)

– GPS MONITOR PAGE ◁ . . . . . P 55
– ACARS FUNCTION PAGE ◁ . . . . . P 56
R – ACARS FUNCTION PAGE 1 ◁ . . . . . P 57
– UPLINK TO DATA REQ PAGE ◁ . . . . . P 58
– UPLINK MAX TO DATA PAGES ◁ . . . . . P 60
– UPLINK FLX DATA PAGES ◁ . . . . . P 61
– ACARS FUNCTION PAGE 2 ◁ . . . . . P 62
– PRINT FUNCTION PAGES ◁ . . . . . P 64
– PERF PAGES . . . . . P 66
– PERF TAKEOFF PAGE . . . . . P 68
– PERF CLIMB PAGE . . . . . P 70
– PERF CRUISE PAGE . . . . . P 72
– PERF DESCENT PAGE . . . . . P 74
– PERF APPR PAGE . . . . . P 76
– PERF GO AROUND PAGE . . . . . P 78
– PROG PAGES . . . . . P 80
– PREDICTIVE GPS PAGE ◁ . . . . . P 84
– RADIO NAV PAGE . . . . . P 86
– SECONDARY PAGES . . . . . P 88

03.30 MCDU MESSAGES

03.40 MCDU DATA FORMAT LIST

03.00 CONTENTS

03.10 INTERFACE VIEWS

– MCDU . . . . . P 1
– FLIGHT CONTROL UNIT (FCU) AND AUTOLAND LIGHT . . . P 2
– THRUST LEVERS . . . . . P 3
– PRIMARY FLIGHT DISPLAY (PFD) . . . . . P 4
– NAVIGATION DISPLAY (ND) . . . . . P 5

03.25 MCDU PAGES DESCRIPTION

– GENERAL . . . . . P 1
– MCDU MENU PAGE . . . . . P 2
– INIT A PAGE . . . . . P 3
– ROUTE SELECTION PAGE . . . . . P 6
– WIND PAGES . . . . . P 8
– INIT B PAGE . . . . . P 12
– FUEL PREDICTION PAGE . . . . . P 16
– FLIGHT PLAN PAGES . . . . . P 18
– LATERAL REVISION PAGES . . . . . P 22
– FIX INFO PAGE . . . . . P 24
– AIRWAYS PAGE . . . . . P 27
– DEPARTURE PAGES . . . . . P 28
– HOLD PAGES . . . . . P 30
– DIRECT TO PAGE . . . . . P 33
– ARRIVAL PAGES . . . . . P 36
– ALTERNATE PAGE . . . . . P 38
– ROUTE SELECTION PAGE FOR ALTERNATE . . . . . P 39
– VERTICAL REVISION PAGES . . . . . P 40
– STEP ALTS PAGE . . . . . P 44
– RTA PAGE . . . . . P 46
– DATA INDEX PAGES . . . . . P 48
– WAYPOINT/STORED WAYPOINT/NEW WAYPOINT PAGES . . P 50
– NAVAID/STORED NAVAID/NEW NAVAID PAGES . . . . . P 52
– RUNWAY/STORED RUNWAY/NEW RUNWAY PAGES . . . . . P 56
– ROUTE/STORED ROUTE/NEW ROUTE PAGES . . . . . P 60
– AIRCRAFT STATUS PAGE . . . . . P 64
– P/N XLOAD PAGE . . . . . P 65
– P/N STATUS PAGE . . . . . P 66
– DUPLICATE NAMES PAGE . . . . . P 69
– POSITION MONITOR PAGE . . . . . P 70
– SELECTED NAVAIDS PAGE . . . . . P 71
– IRS MONITOR PAGE . . . . . P 74

03

03.25 MCDU PAGES DESCRIPTION (Cont'd)

– GPS MONITOR PAGE . . . . . P 76
– CLOSEST AIRPORTS PAGES . . . . . P 78
– EQUITIME POINT PAGE . . . . . P 80
– PRINT FUNCTION PAGES . . . . . P 82
– ACARS FUNCTION PAGES . . . . . P 84
– ACARS FUNCTION PAGE 1 . . . . . P 85
– UPLINK TO DATA REQ PAGES . . . . . P 86
– UPLINK MAX TO DATA PAGES . . . . . P 88
– UPLINK FLX (or DRT) TO DATA PAGES . . . . . P 89
– ACARS FUNCTION PAGE 2 . . . . . P 90
– PERF PAGES . . . . . P 92
– PERF TAKEOFF PAGE . . . . . P 94
– PERF CLIMB PAGE . . . . . P 96
– PERF CRUISE PAGE . . . . . P 98
– PERF DESCENT PAGE . . . . . P 100
– PERF APPR PAGE . . . . . P 102
– PERF GO AROUND PAGE . . . . . P 104
– PROG PAGES . . . . . P 106
– PREDICTIVE GPS PAGE . . . . . P 110
– REPORT PAGE . . . . . P 112
– RADIO NAV PAGE . . . . . P 114
– SECONDARY PAGES . . . . . P 116

03.35 MCDU MESSAGES

03.40 MCDU DATA FORMAT LIST

03.00 CONTENTS

03.10 INTERFACE VIEWS

– MCDU . . . . . P 1
– FLIGHT CONTROL UNIT (FCU) AND AUTOLAND LIGHT . . . P 2
– THRUST LEVERS . . . . . P 3
– PRIMARY FLIGHT DISPLAY (PFD) . . . . . P 4
– NAVIGATION DISPLAY (ND) . . . . . P 5

03.28 MCDU PAGES DESCRIPTION

– GENERAL . . . . . P 1
– MCDU MENU PAGE . . . . . P 2
– INIT A PAGE . . . . . P 3
– ROUTE SELECTION PAGE . . . . . P 6
– IRS INIT PAGE . . . . . P 7
– WIND PAGES . . . . . P 8
– INIT B PAGE . . . . . P 13
– FUEL PREDICTION PAGE . . . . . P 15
– FLIGHT PLAN PAGES . . . . . P 17
– LATERAL REVISION PAGES . . . . . P 21
– AIRWAYS PAGE . . . . . P 24
– DEPARTURE PAGES . . . . . P 25
– HOLD PAGES . . . . . P 27
– DIRECT TO PAGE . . . . . P 30
– ARRIVAL PAGES . . . . . P 34
– ALTERNATE PAGE . . . . . P 37
– ROUTE SELECTION PAGE FOR ALTERNATE . . . . . P 38
– VERTICAL REVISION PAGES . . . . . P 39
– STEP ALTS PAGE . . . . . P 43
– DATA INDEX PAGES . . . . . P 45
– WAYPOINT/PILOTS WAYPOINT/NEW WAYPOINT PAGES . . . P 47
– NAVAID/PILOTS NAVAID/NEW NAVAID PAGES . . . . . P 49
– RUNWAY/PILOTS RUNWAY/NEW RUNWAY PAGES . . . . . P 53
– ROUTE/PILOTS ROUTE/NEW ROUTE PAGES . . . . . P 56
– AIRCRAFT STATUS PAGE . . . . . P 59
– P/N XLOAD PAGE . . . . . P 60
– P/N STATUS PAGE . . . . . P 61
– DUPLICATE NAMES PAGE . . . . . P 63
– POSITION MONITOR PAGE . . . . . P 64
– SELECTED NAVAIDS PAGE . . . . . P 65
– IRS MONITOR PAGE . . . . . P 67

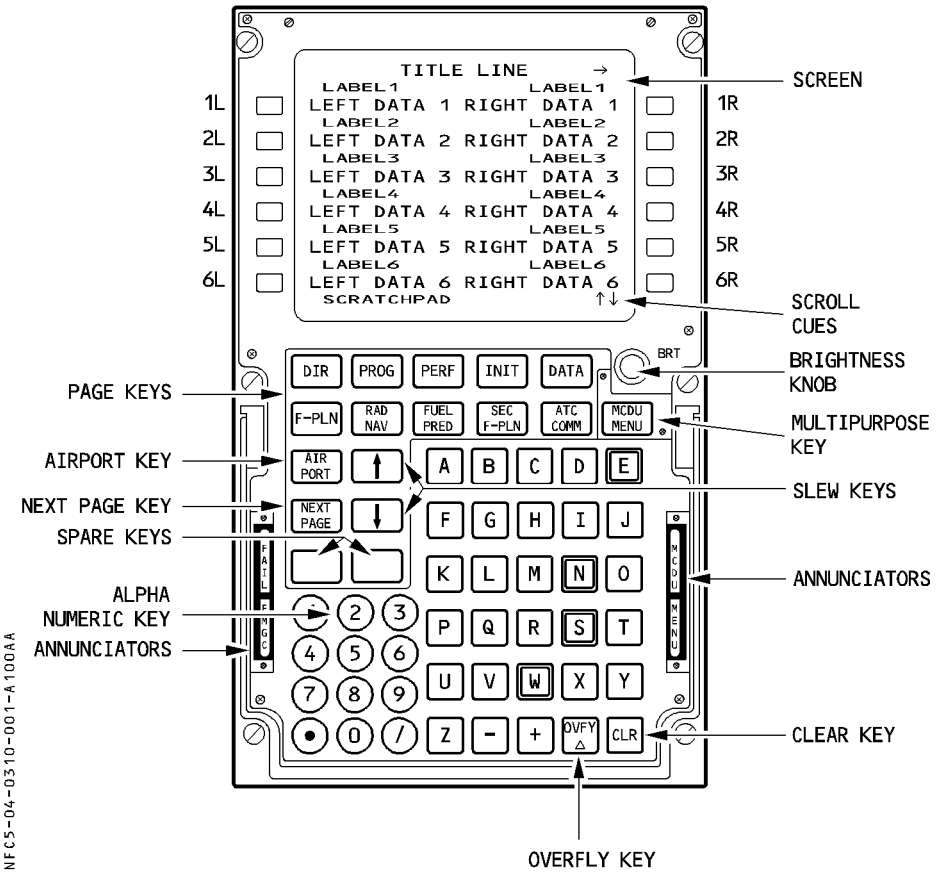
03.28 MCDU PAGES DESCRIPTION (Cont'd)

– IRS 1(2)(3) PAGE . . . . . P 68
– GPS MONITOR PAGE . . . . . P 69
– PRINT FUNCTION PAGES . . . . . P 71
– AOC FUNCTION PAGES . . . . . P 73
– AOC FUNCTION PAGE 1 . . . . . P 74
– UPLINK TO DATA REQ PAGES . . . . . P 75
– UPLINK MAX TO DATA PAGES . . . . . P 77
– UPLINK FLX TO DATA PAGES . . . . . P 78
– AOC FUNCTION PAGE 2 . . . . . P 79
– PERF PAGES . . . . . P 81
– PERF TAKEOFF PAGE . . . . . P 83
– PERF CLIMB PAGE . . . . . P 85
– PERF CRUISE PAGE . . . . . P 87
– PERF DESCENT PAGE . . . . . P 89
– PERF APPR PAGE . . . . . P 91
– PERF GO AROUND PAGE . . . . . P 93
– PROG PAGES . . . . . P 95
– PREDICTIVE GPS PAGE . . . . . P 99
– REPORT PAGE . . . . . P 101
– RADIO NAV PAGE . . . . . P 103
– SECONDARY PAGES . . . . . P 105
– RADIAL FIX INFO PAGE . . . . . P 109
– CLOSEST AIRPORTS PAGE . . . . . P 111
– EQUI-TIME POINT PAGE . . . . . P 113
– RTA PAGE . . . . . P 115
– CONSTANT MACH PAGE . . . . . P 117

03.38 MCDU MESSAGES

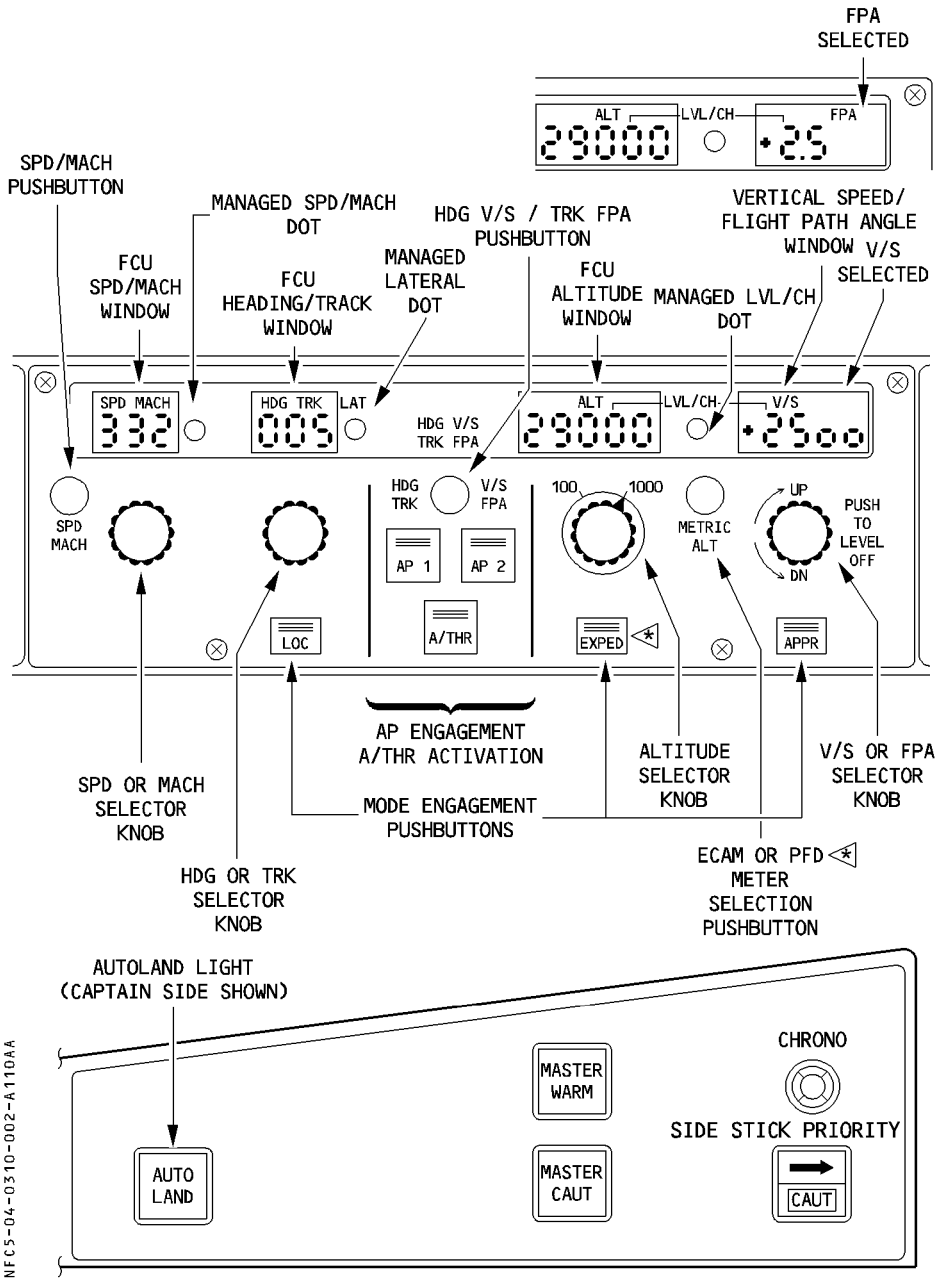
03.40 MCDU DATA FORMAT LIST

MCDU

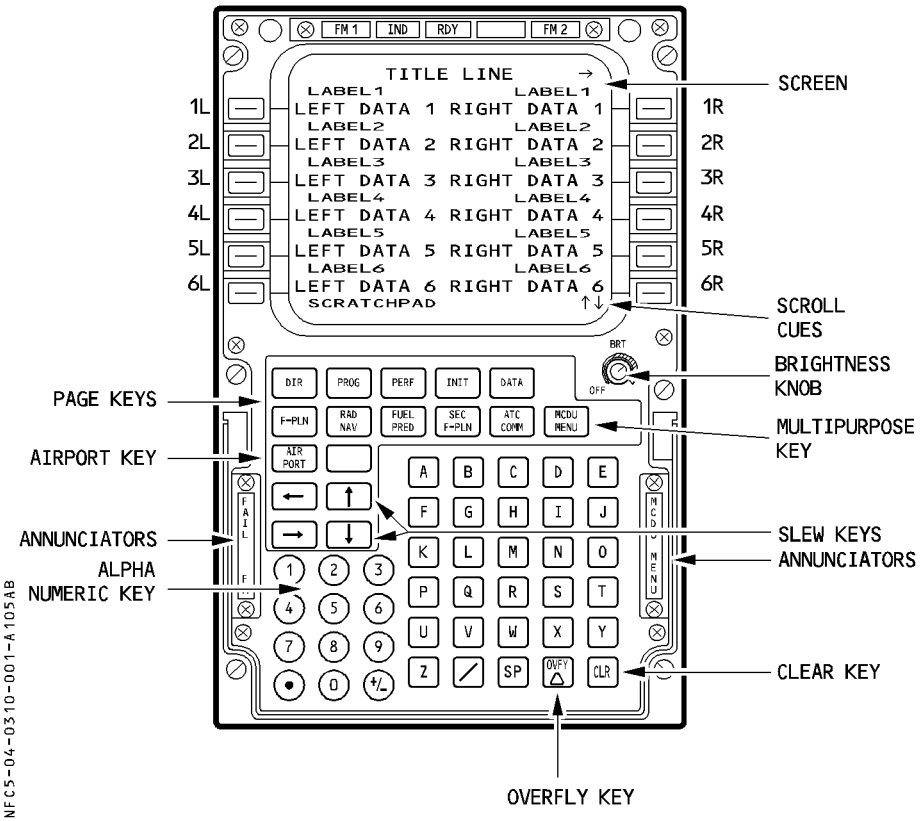

TITLE LINE →
LABEL1 LABEL1
1L LEFT DATA 1 RIGHT DATA 1 1R
LABEL2 LABEL2
2L LEFT DATA 2 RIGHT DATA 2 2R
LABEL3 LABEL3
3L LEFT DATA 3 RIGHT DATA 3 3R
LABEL4 LABEL4
4L LEFT DATA 4 RIGHT DATA 4 4R
LABEL5 LABEL5
5L LEFT DATA 5 RIGHT DATA 5 5R
LABEL6 LABEL6
6L LEFT DATA 6 RIGHT DATA 6 6R
SCRATCHPAD ↑↓
SCREEN
SCROLL CUES
BRT
BRIGHTNESS KNOB
PAGE KEYS
DIR PROG PERF INIT DATA
F-PLN RAD NAV FUEL PRED SEC F-PLN ATC COMM MCDU MENU
MULTIPURPOSE KEY
AIRPORT KEY
AIR PORT
NEXT PAGE KEY
NEXT PAGE
SPARE KEYS
SLEW KEYS
A B C D E
F G H I J
K L M N O
P Q R S T
U V W X Y
Z - + OVFY CLR
ANNUNCIATORS
ALPHA NUMERIC KEY
ANNUNCIATORS
CLEAR KEY
OVERFLY KEY
NFC5-04-0310-001-A100AA

R

FLIGHT CONTROL UNIT (FCU) AND AUTOLAND LIGHT

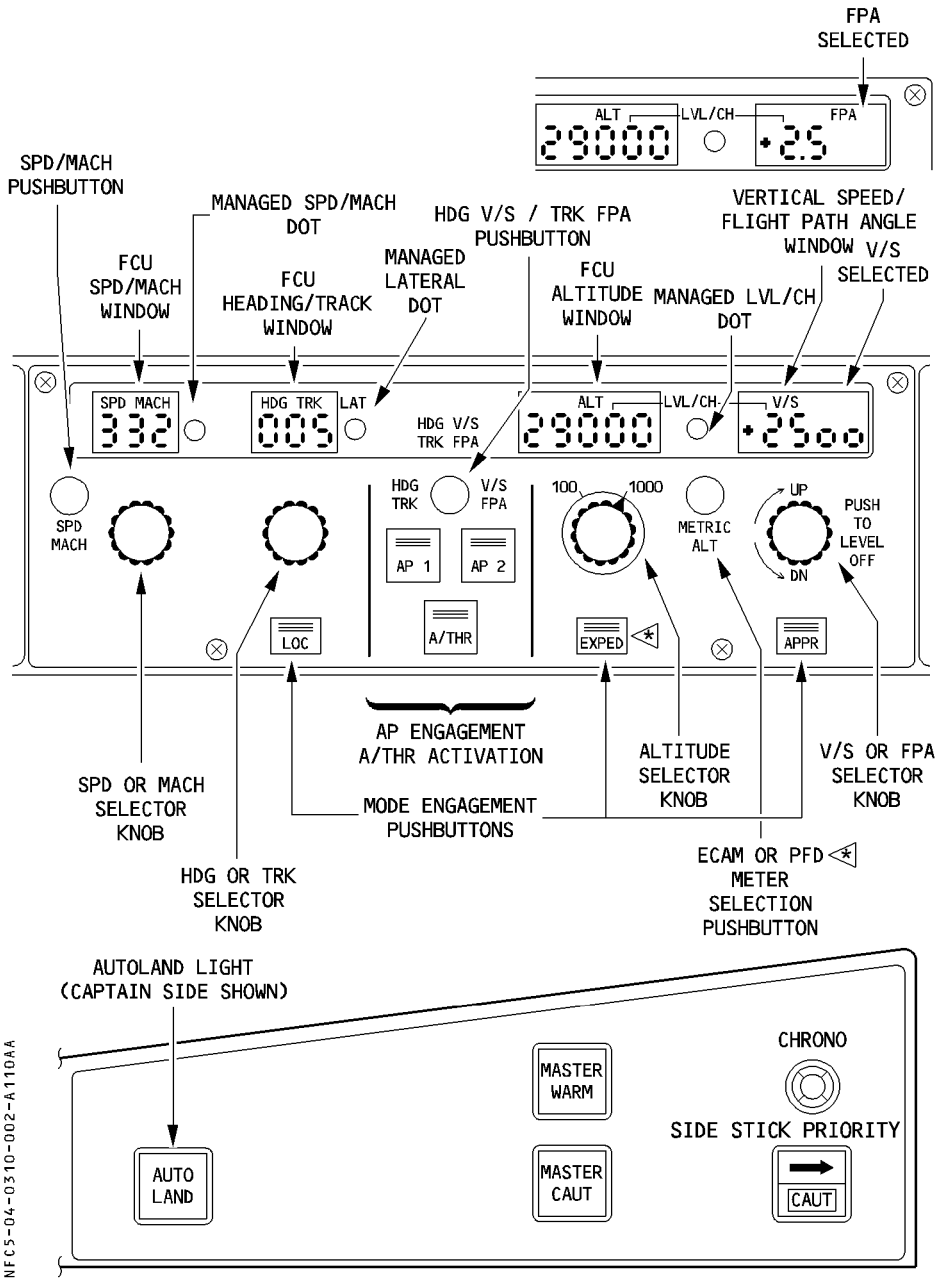


MCDU

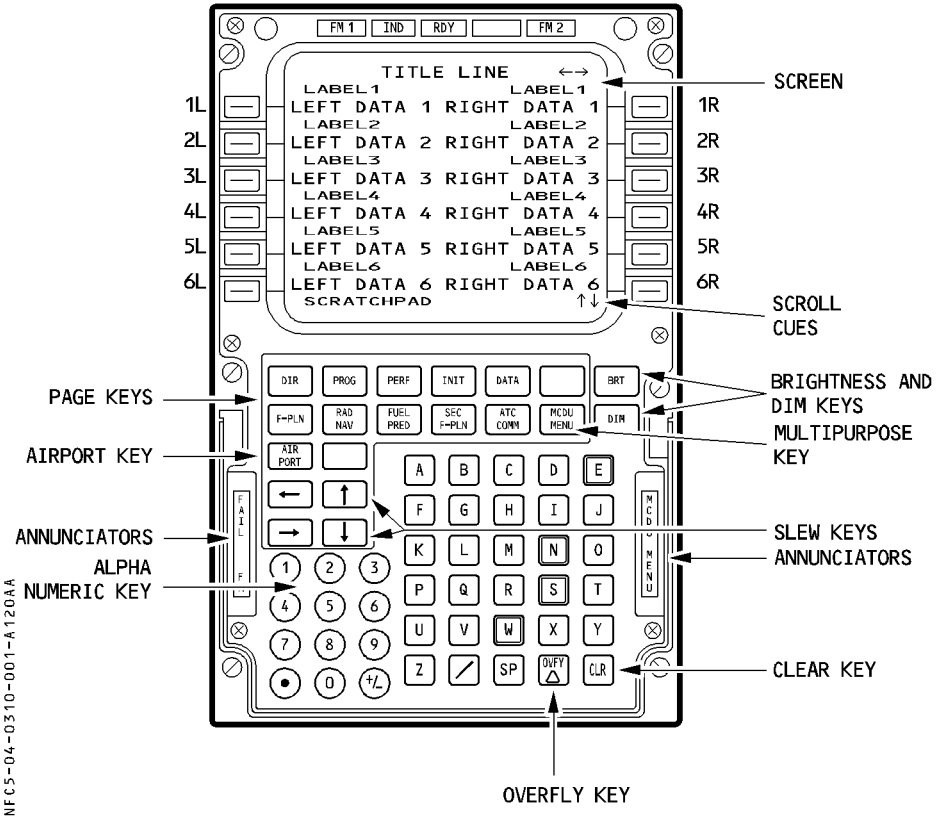

FM 1
IND
RDY
FM 2
TITLE LINE
LABEL1
LEFT DATA 1
RIGHT DATA 1
LABEL2
LEFT DATA 2
RIGHT DATA 2
LABEL3
LEFT DATA 3
RIGHT DATA 3
LABEL4
LEFT DATA 4
RIGHT DATA 4
LABEL5
LEFT DATA 5
RIGHT DATA 5
LABEL6
LEFT DATA 6
RIGHT DATA 6
SCRATCHPAD
1L
2L
3L
4L
5L
6L
1R
2R
3R
4R
5R
6R
BRT
OFF
DIR
PROG
PERF
INIT
DATA
F-PLN
RAD NAV
FUEL PRED
SEC F-PLN
ATC COMM
MCDU MENU
AIR PORT
FAIL
MCDU MENU
A B C D E
F G H I J
K L M N O
P Q R S T
U V W X Y
Z / SP OVFY CLR
1 2 3
4 5 6
7 8 9
. 0 +/-
SCREEN
SCROLL CUES
BRIGHTNESS KNOB
MULTIPURPOSE KEY
PAGE KEYS
AIRPORT KEY
ANNUNCIATORS
ALPHA NUMERIC KEY
SLEW KEYS
ANNUNCIATORS
CLEAR KEY
OVERFLY KEY
NFCS-04-0310-001-A105AB

R

FLIGHT CONTROL UNIT (FCU) AND AUTOLAND LIGHT



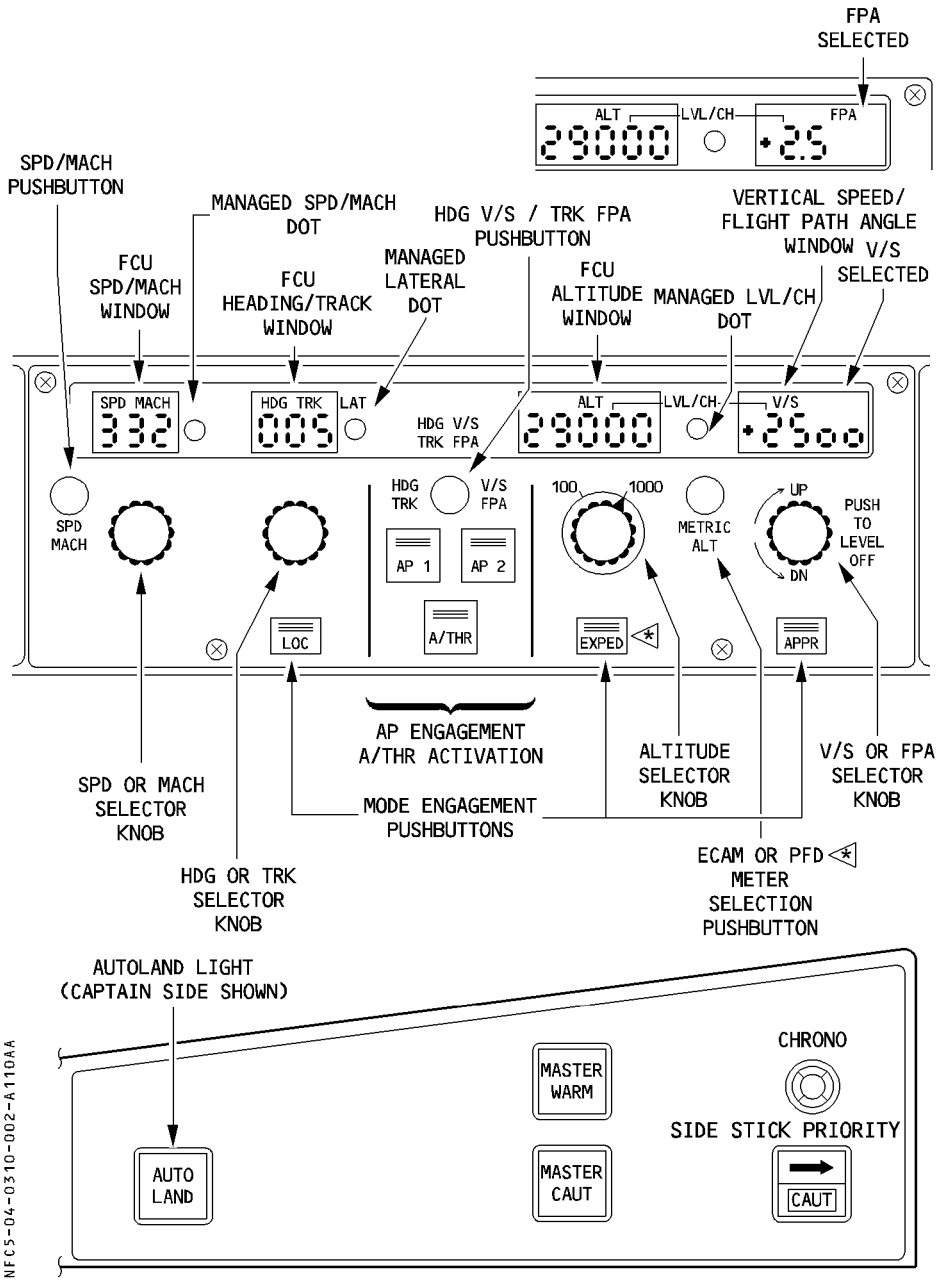
MCDU



NFCS-04-0310-001-A120AA

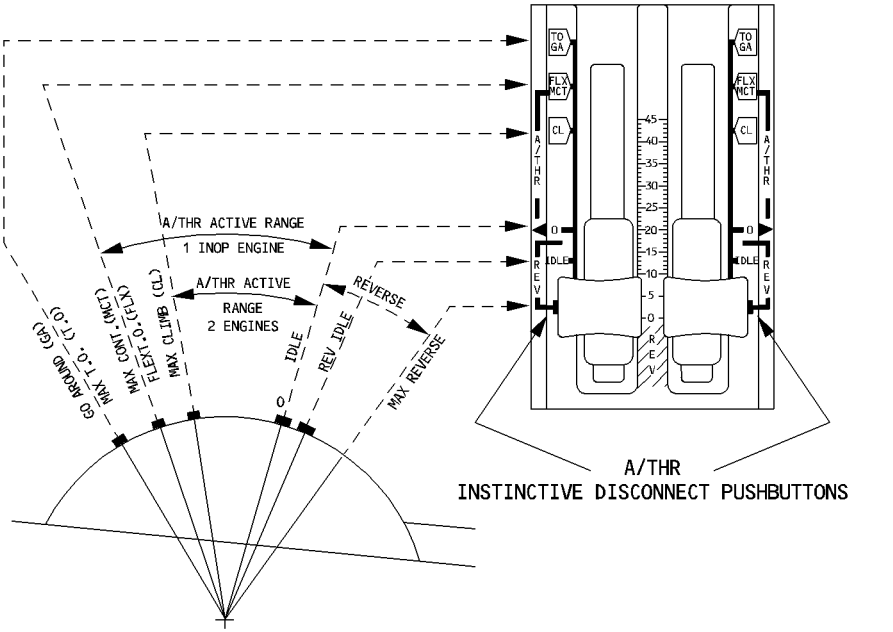
R

FLIGHT CONTROL UNIT (FCU) AND AUTOLAND LIGHT

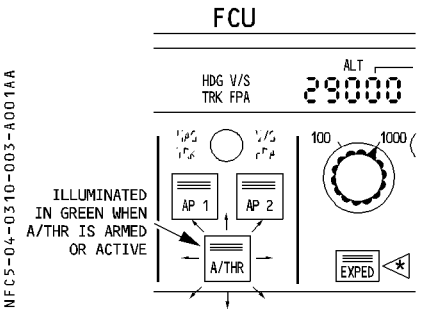


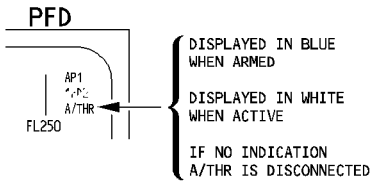
R

THRUST LEVERS



A/THR
INSTINCTIVE DISCONNECT PUSHBUTTONS

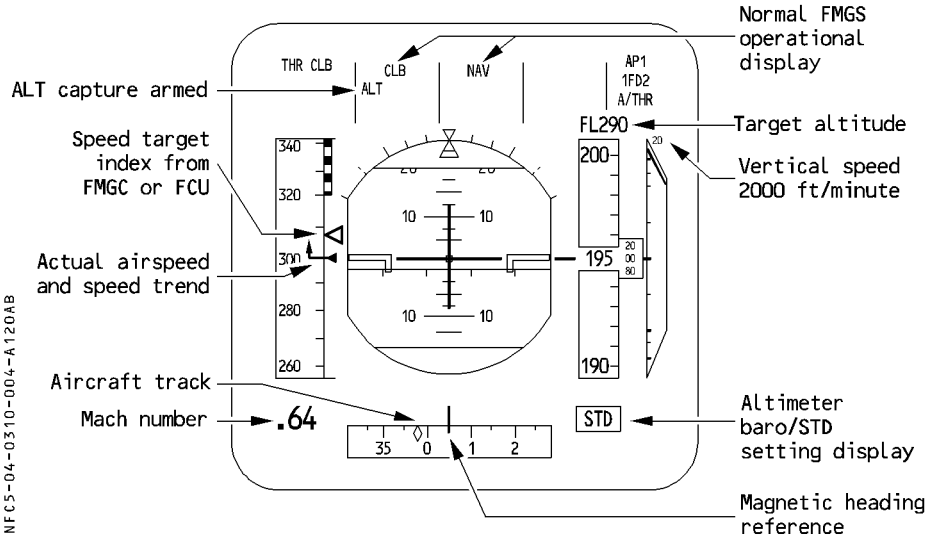




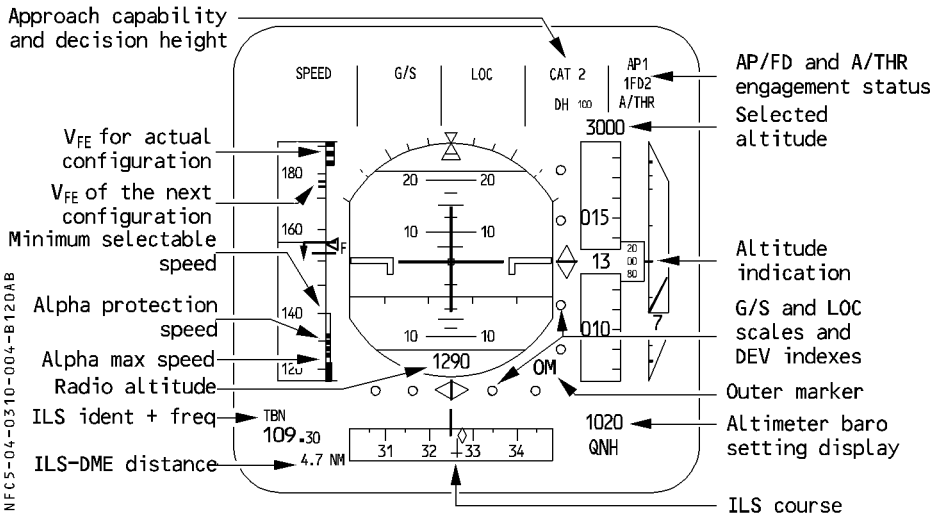
NFC5-04-0310-003-A001AA

PRIMARY FLIGHT DISPLAY (PFD)

CLIMB PHASE



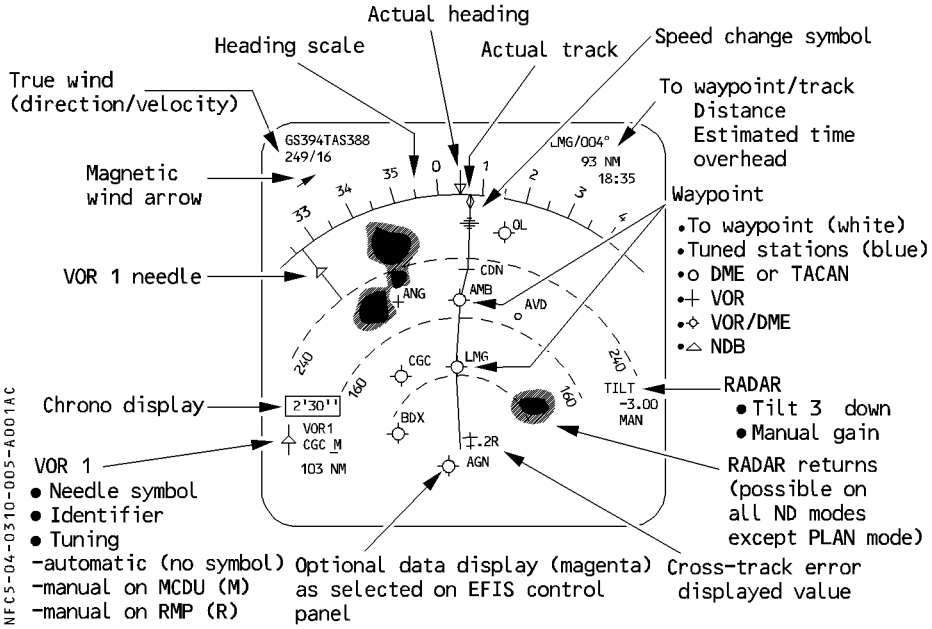
APPROACH PHASE



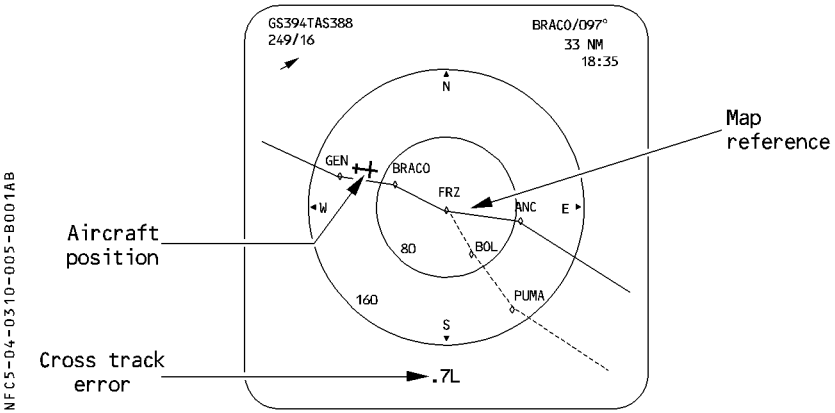
For details refer to FCOM 1.31.

NAVIGATION DISPLAY (ND)

ARC MODE



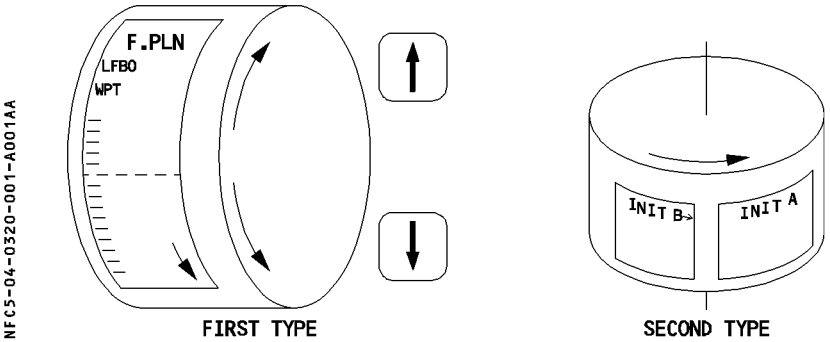
PLAN MODE



For details refer to FCOM 1.31.

GENERAL

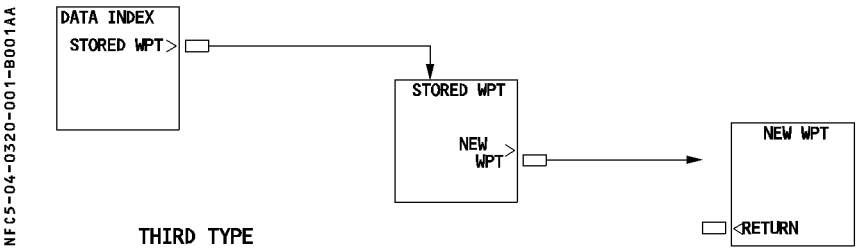
The FMGS (flight management and guidance system) displays information on various "pages". When a page cannot display all the information assigned, it cues the pilot to call up additional information.
There are three types of pages, and each type has its particular way of cuing the pilot to call up additional information.



First type
When this page cannot display all the information on the screen simultaneously (more information than the six pairs of lines on the screen can hold), the pilot can scroll the page up or down.
When this is the case, the screen displays a ↑↓ symbol in its bottom righthand corner (F-PLN pages, secondary F-PLN page, departure/arrival pages,...).

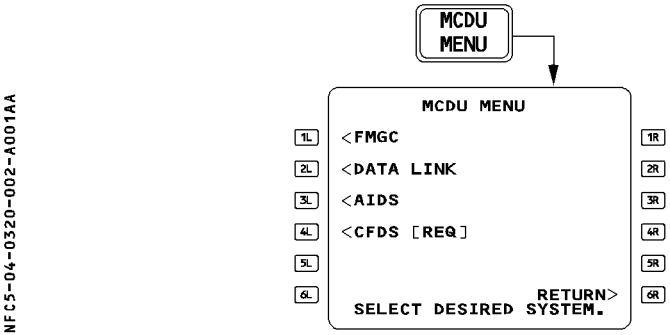
Second type
When successive pages hold the information, the pilot presses the "NEXT PAGE" key to call up these pages sequentially.
In this case, the page displays an arrow in the top righthand corner of the screen (INIT pages).

Third type
When successive pages hold different types of information, the pilot calls these up by pressing the key adjacent to the prompts >, < or *.



MCDU MENU PAGE

This page lists the various systems to which the pilot can gain access through the MCDU.



The pilot selects a system by pressing the key adjacent to the name of that system. The screen shows the name of the selected system in green, all others in white.
If the MCDU cannot establish communication with the selected system, it displays “TIME OUT”.
When a system calls for pilot attention, the MCDU displays “REQ” next to the system name, and the “MCDU MENU” annunciator lights up.
When the pilot presses the key next to the name of the system that requires attention, the “MCDU MENU” annunciator light goes out.

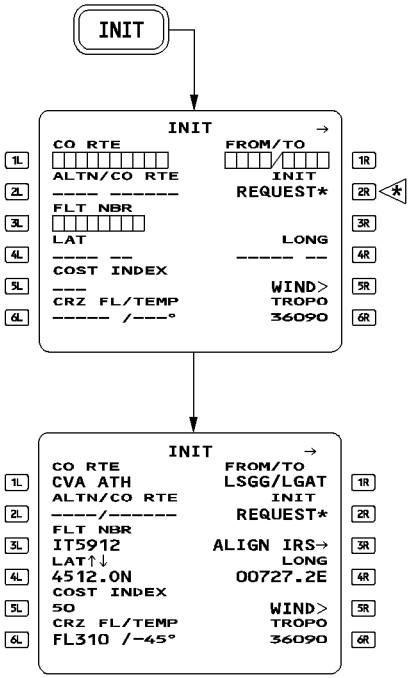
Note : When the MCDU is communicating with a system other than the FMGC, the pilot should use the MCDU MENU page to revert to the FMGC system.
The MCDU may freeze if the pilot tries to gain access to a system directly by selecting it with an access key.

INIT A PAGE

The pilot uses the INIT A page to initialize the flight plan and align the inertial reference system.

- The pilot accesses this page by pressing the INIT key on the MCDU console, but only during the preflight phase.
- The pilot may also call up this page by :
  - Pressing the "NEXT PAGE" key on the MCDU console, while on the INIT B page, or
  - Pressing the key next to "RETURN" or "INSERT" on the route selection page.

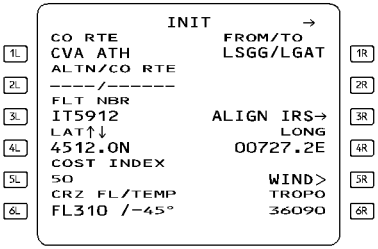
R - When in the done phase, the pilot may press the INIT key to begin the next preflight
R phase.



NFCS-04-0320-003-A100AA

[1L] CO RTE	If the flight crew enters a company route number, the screen displays all data associated with that route (8 or 10 characters, depending on the pin program). Inserting the CO RTE into the RTE selection page also enters the CO RTE number in this field.
[2L] ALTN/CO RTE (blue)	This field is dashed until a primary destination is entered in the 1R field. If a preferred alternate is associated with the primary destination, it is displayed in this field with the company route identification. The crew may enter an alternate and a company route manually. If preferred alternate is not associated with the primary destination, NONE is displayed in this field. When the alternate route and the primary destination do not match, the MCDU scratchpad displays "DEST/ALTN MISMATCH". If the primary destination is changed, this field is modified accordingly.
[3L] FLIGHT NUMBER	The flight number appears in this field automatically if it is stored with the company route. The flight crew may modify it or enter a new number here.
[4L] LAT	The latitude of the departure airport reference point appears here. The flight crew may modify it by slewing or overwriting.
[5L] COST INDEX	This is usually stored in the data base along with the company route. The flight crew may modify it or enter a new value here. It defaults to the last entered value if a value is not stored in the data base.
[6L] CRZ FL/TEMP (cruise flight level and temperature)	The cruise flight level is usually stored in the data base along with the company route. If not, it has to be entered manually. If no cruise flight level is entered, the system will not furnish predictions while the aircraft is on the ground. The flight crew has to enter the temperature at cruise flight level in order to refine the predictions. Otherwise these are computed for ISA conditions. (If no sign is entered, the system uses plus).

NFCS-04-0320-005-A105AA



[1R] FROM/TO — This field enables the flight crew to enter a city pair (ICAO codes for city of origin and destination). This entry automatically deletes any previously entered company route, and calls up the ROUTE SELECTION page. If one airfield of the pair is not in the database, the display changes to the NEW RWY page.

[3R] ALIGN IRS — This field only displays this legend if the LAT and LONG fields are filled in, and at least one of the inertial reference systems is in ALIGN status (IRS in NAV position and alignment process not over). If the flight crew presses this key when its field is displaying this legend, the present coordinates are sent to the IRSs, and this completes the alignment process.

[4R] LONG — This field displays the longitude of the departure airport reference point. The flight crew may modify by slewing or overwriting.

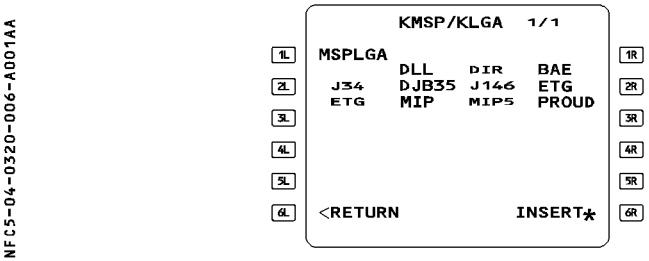
[5R] WIND > — The flight crew presses this key to access the CLIMB WIND page, unless a temporary flight plan exists. In this case, the scratchpad displays “TEMPORARY F-PLN EXISTS”.

[6R] TROPO — The default tropopause altitude is 36090 feet. The flight crew can use this field to modify it (39000 feet maximum).

ROUTE SELECTION PAGE

This page displays all the company routes, stored in the database, that are associated with the inserted city pair. It can be called up manually, or displayed automatically.

- Manually : The pilot presses the FROM/TO or ALTN key on the INIT A page, when a city pair is displayed.
- Automatically : The system displays it, when the pilot enters a city pair, defines an
R alternate on the INIT A page of the active or secondary flight plan, or when the flight
R crew enters an OTHER ALTN on the alternate page.



NFC5-04-0320-006-A001AA

TITLE	Idents for the city pair are inserted on the INIT A page. (The numbers in the upper righthand corner are the total number of company routes from this city pair stored in the database).
[1L]	This field shows the name of the company route displayed on the page. NONE appears, if there is no company route for this city pair.
Line 2 to Line 5	These fields display the various elements of the company route : Waypoints in large green font, and airways in small white font.
[6L] RETURN	The pilot presses this key to return to the INIT A page.
R [6R] INSERT R or SELECT	This prompt displays an amber INSERT (blue for the secondary flight plan), if the pilot accessed the page from the INIT A (or secondary INIT A) page. It displays SELECT (blue) if the crew accessed the page from the alternate page. The pilot presses this key to insert the displayed company route in the respective flight plan and to return the display to the accessing page.

R *Note : The pilot can slew the display to show the rest of the route, if one page does*
R *not show it all, or to display other company routes for this city pair.*

INTENTIONALLY LEFT BLANK

WIND PAGES

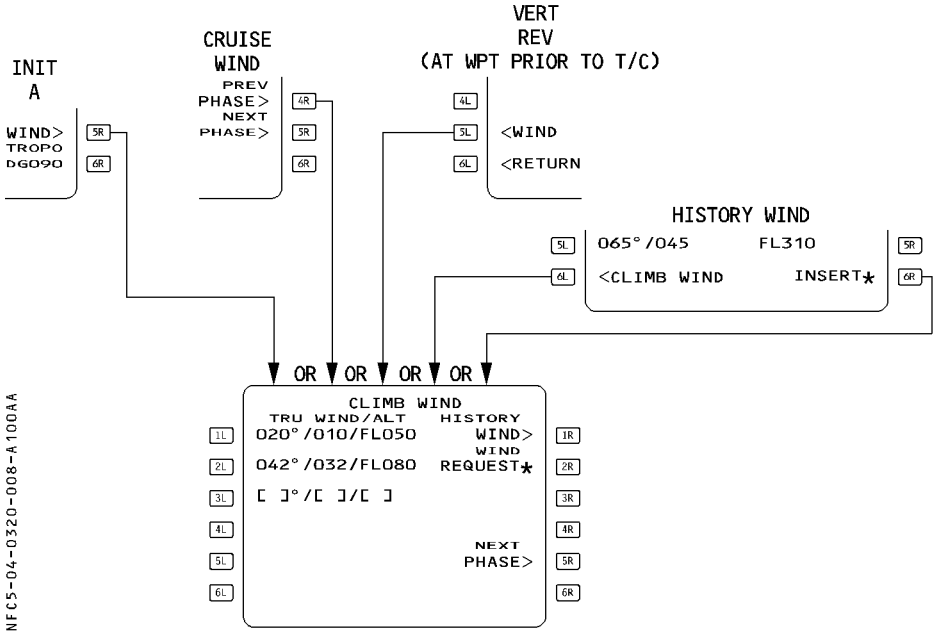
Winds in climb, cruise, descent and approach are necessary to provide the pilot with reliable predictions and performance. Wind pages enable the pilot to enter and/or review the winds propagated by the FMGS or sent by ACARS for the various flight phases.

Note : On WIND pages, wind direction is always true referenced.

CLIMB WIND PAGE

This page enables the pilot to enter and/or review predicted wind vectors (direction and velocity) at up to 5 different levels.

CLIMB WIND page is accessed from :



TITLE — CLIMB WIND in large white font.

[1L] TRU WIND/ALT to [5L] — This field displays the winds, entered at various climb altitudes : In blue before climb phase activation, and in green after climb phase activation.
This field may also display history winds or uplink winds.
Large blue brackets are displayed before any wind entry.
Pilot-entered and uplinked winds are displayed in large font.
History wind data is displayed in small font.
Upon sequencing the top of climb, the climb winds are deleted.

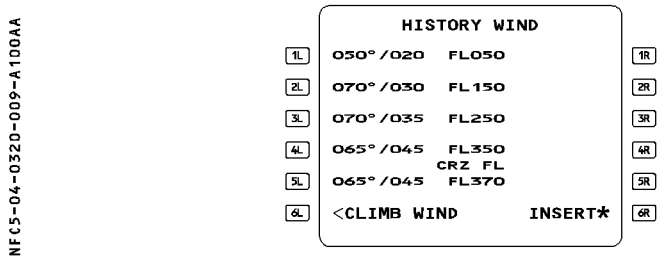
Note : Climb winds are not deleted, when the origin airport is changed.

[1R] HISTORY WIND — Displayed in preflight phase only. This key calls up the history wind page. This page is not modifiable (small green font), but can be inserted into the CLIMB WIND page by using the 6R key and modified accordingly.

[2R] WIND REQUEST ◁ — Pressing this key sends a request for ACARS winds. (Refer to 4.04.40). This prompt is only active on ACARS-equipped aircraft.

[5R] NEXT PHASE — Pressing this key calls up the CRUISE WIND page, or the DESCENT WIND page, if no cruise waypoint exists.

HISTORY WIND PAGE



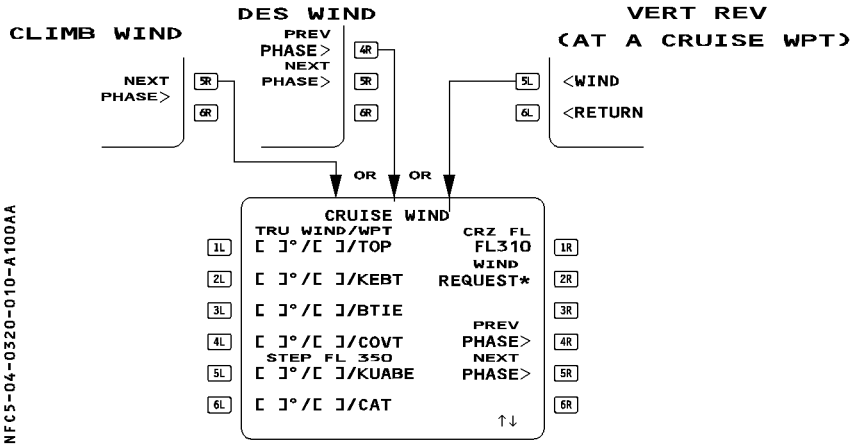
NFCS-04-0320-009-A100AA

[6L] CLIMB WIND — This key reverts the display to the CLIMB WIND page.

[6R] INSERT — This key inserts the history wind values into the CLIMB WIND page.

CRUISE WIND PAGE

This page displays the wind (direction and velocity) for each cruise waypoint.
Cruise wind page is accessed as following.



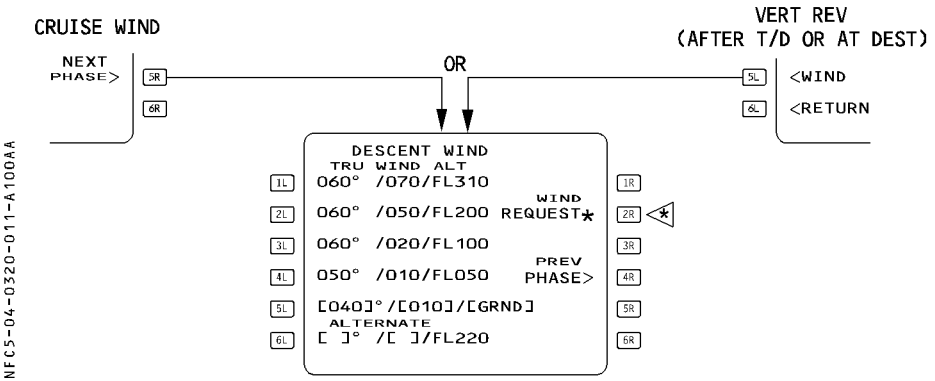
TITLE	CRUISE WIND in white large font.
[1L] TRU WIND/WPT to [6L]	These lines display the cruise wind at associated waypoint. Winds are sorted in waypoint flight plan order. The crew cannot modify the waypoints on this page. Step flight level is displayed in the label line of the first waypoint of the step. Any modification of the cruise wind page modifies the winds of the flight plan B page accordingly Both uplinked winds and pilot entered winds are displayed in blue large font. Wind data are modifiable during the cruise.
[1R] CRZ or STEP FL	This field displays in green large font, the predicted flight level of the [1L] waypoint. If a cruise flight level is not defined, dashes are displayed.
[2R] WIND REQUEST *	Pressing this key sends a request for ACARS winds. (Refer to 4.04.40)
[4R] PREV PHASE	This prompt is displayed in Preflight, Takeoff, Climb and Done phases. Pressing this prompt calls up the CLIMB WIND page.
[5R] NEXT PHASE	Pressing this prompt calls up the DES WIND page.

Any new entry performed on the CRUISE WIND page is immediately inserted into the corresponding flight plan. Predictions are dashed on the F-PLN pages during the recomputation time.
CRUISE WIND page reverts automatically to F-PLN page if a temporary flight plan is created or the secondary flight plan is activated.

DESCENT WIND PAGE

This page allows the pilot to define and display the winds used for computing the descent profile.
The pilot calls it up by selecting NEXT PHASE on the CRUISE WIND page or WIND prompt on VERT REV page.

R



[1L] to [5L]	This displays inserted winds or uplinked winds in blue large fonts prior to activating the descent phase (modifiable values) and in green colour after descent phase activation (not modifiable values). An entry of "GRND" in the "ALT" field is seen as the wind at ground level. This wind is copied on the PERF APPR page (and corrected for the magnetic variation). A clear action on one key reverts the line to blue bracket.
[6L] ALTERNATE	This field is displayed only when an alternate is defined. The pilot entered value or uplinked value is displayed in blue large font. Always modifiable by the pilot.
[2R] WIND REQUEST*	Pressing this key sends a request for ACARS winds. (Refer to 4.04.40)
[4R] PREV PHASE	Pressing this key calls up the CRUISE WIND page. The field is erased after the top of descent has sequenced.

Note : Descent winds and alternate wind are deleted if the destination airport is changed.

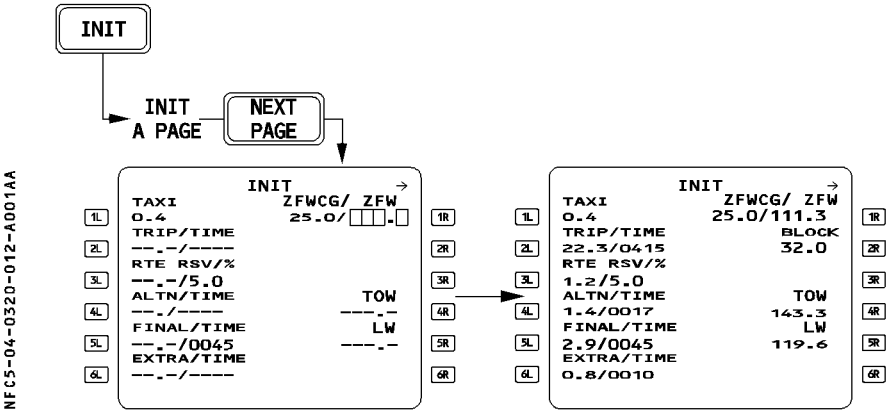
INIT B PAGE

The pilot uses this page to initialize gross weight and center of gravity before starting the engines.

The pilot can call it up from the INIT A page by pressing the NEXT PAGE key (or the [→] key depending on the MCDU keyboard) on the MCDU console, as long as both engines have not been started.

This page automatically reverts to the FUEL PRED page after the first engine is started.

R The FMGC computes its predictions based on the FOB indicated by the FQI (or FAC as
R backup) from that moment on.



[1L] TAXI — This is the taxi fuel, which defaults to a preset value, (usually 200 kilos or 400 pounds). The pilot can change the value through this field.

[2L] TRIP/TIME (green) — This field displays trip fuel and time when predictions become available.
The pilot cannot modify this data.

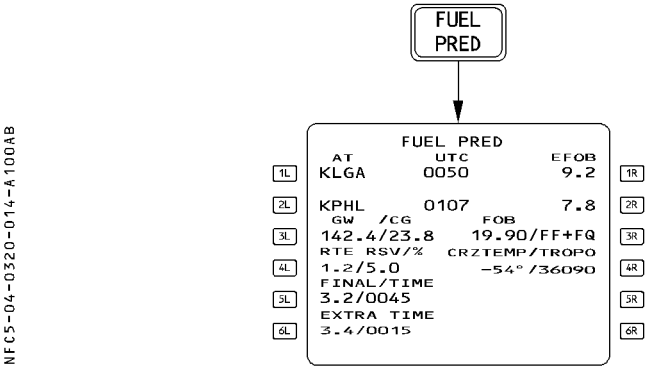
[3L] RTE RSV/% (blue) — This field displays the reserve fuel for the route and the corresponding percentage of trip fuel. It may be blank, if such is the policy of the operator. The pilot can enter either a route reserve or a percentage, and the system then computes the nominal value automatically.

[4L] ALTN/TIME (green)	This field displays alternate trip fuel and time, assuming that Cost Index = 0, and that the aircraft flies at the default cruise flight level. This field displays its information in a small font, and the flight crew cannot modify it.
[5L] FINAL/TIME (blue)	This field displays hold fuel and time associated with continued flight to the alternate airport (or destination airport if no alternate is defined). The pilot may enter a final fuel or time (at alternate or destination) and the system will compute associated holding fuel/time available. Assumptions include a racetrack pattern 1500 feet above the alternate airport, with the aircraft in clean configuration at green dot speed (or in accordance with Operator fuel policy established in the database).
[6L] EXTRA/TIME (green)	This field displays the amount of extra fuel and the available time it represents for holding over the alternate or primary destination, if the flight crew did not define an alternate. EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + ALTN + FINAL) The field displays this information in a small font, and the flight crew cannot modify it.
[1R] ZFWCG/ZFW	This field displays the location of the zero fuel weight CG. It is an optional entry that defaults to 25%. The flight crew can modify this data. The zero fuel weight is a mandatory entry that allows the system to compute speed management and predictions.
[2R] BLOCK	The block fuel in this field is a mandatory entry that allows the system to predict the estimated fuel on board (EFOB).
[4R] TOW (green)	This field displays the computed takeoff weight. The pilot cannot modify it (small font).
[5R] LW (green)	This field displays the computed landing weight at the primary destination. This field displays its information in a small font, and the flight crew cannot modify it.

Note : If the flight crew enters a number in field 1R or 2R that exceeds the limits, the field displays "ENTRY OUT OF RANGE" and does not accept the value .

FUEL PREDICTION PAGE

The pilot presses the FUEL PRED key on the MCDU console to display fuel prediction information at destination and alternate, as well as fuel management data after the engines are started.



Line 1
AT-UTC/TIME-EFOB

These fields display predictions of time and fuel to the primary destination. TIME is displayed before takeoff, UTC predictions after takeoff. After the pilot enters an Estimated Takeoff Time (ETT), the UTC is displayed.

Line 2
AT-UTC/TIME-EFOB

These fields display predictions of time and fuel to the alternate airport. See 4.04.10 for details.

[3L] GW/CG

GW

The system continually updates gross weight during the flight. If no zero fuel weight has been entered, the screen displays amber boxes next to this key. The pilot must enter information in these boxes in order to obtain a speed profile, speed computations, and predictions. The field displays dashes, as long as the system is not calculating fuel on board.

CG

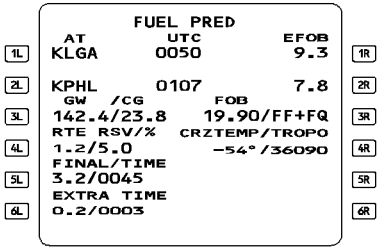
The system continually updates the center of gravity location along the flight path.

The pilot can modify both the GW and CG.

R [4L] RTE RSV/%

R Prior to departure, this field displays the route reserve fuel and
R the corresponding percentage of trip fuel. After takeoff, it
R displays the percentage of the remaining trip fuel from the
R present position to the destination. The field may be blank, depending on the fuel policy of the operating airline. The crew can enter either a RTE RSV or a RTE RSV %. The system automatically computes the other value.

NFCS-04-0320-015-A100AA



[5L] FINAL/TIME — This field displays the amount of fuel available for holding and the amount of hold time that will be available over the alternate airport (or primary destination if no alternate is defined). The pilot may enter either a final fuel or a time, although the system computes a nominal value automatically. The system assumes that the holding will be in a racetrack pattern 1500 feet above the alternate airport, with the aircraft in clean configuration at green dot speed (or will obey the "airline fuel policy" of the data base).

[6L] EXTRA/TIME — This field displays the amount of extra fuel and the resulting time available for holding over the primary destination.
EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + ALTN + FINAL)
The pilot cannot modify this field (displayed in green, small font).

[3R] FOB — This field displays the fuel on board, computed :
- with information from the fuel flow and fuel quantity sensor (FF + FQ), or
- from FF only (enter/FF to deselect FQ), or
- from FQ only (enter/FQ to deselect FF)

The pilot can modify this number.

[4R] CRZ TEMP/TROPO — This field displays the temperature at the cruise flight level and the altitude of the tropopause.
The pilot can modify both values.
This field is dashed when the aircraft sequences the top of climb.

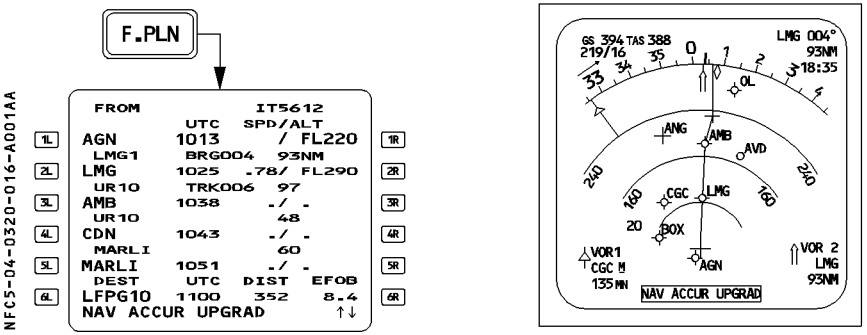
Note : All fields except [4R] show dashes until the pilot starts an engine.

FLIGHT PLAN PAGES

These pages display all waypoints of the active and alternate flight plans, along with associated predictions.
The pilot can make all revisions to the lateral and vertical flight plans through these pages: he presses the left key to revise the lateral flight plan and the right key to revise the vertical flight plan.
He presses the F-PLN key on the MCDU console to gain access to the A page of the active flight plan.

FLIGHT PLAN A PAGE

The A page displays time, speed, and altitude predictions for each waypoint of the active flight plan.



TITLE	FLIGHT NUMBER (blank if no flight number has been entered) This line may display yellow TMPY if a temporary flight plan exists, white OFST if a lateral offset is flown or yellow OFST if a lateral offset revision is pending.
Line 1 to Line 5 WPT, UTC, SPD, ALT	These lines display consecutive waypoints along with associated predictions of time, speed or Mach and altitude for each. TIME is displayed before takeoff and UTC after takeoff. After the pilot enters an estimated takeoff time (ETT), UTC is displayed. The time and flight level display at the FROM waypoint (first line of the flight plan) are values that the system memorized at waypoint sequencing.
[1R] SPD/ALT	The field dedicated to SPEED or MACH is blank at the FROM waypoint except at airport of departure. (V1 is displayed associated with runway elevation).

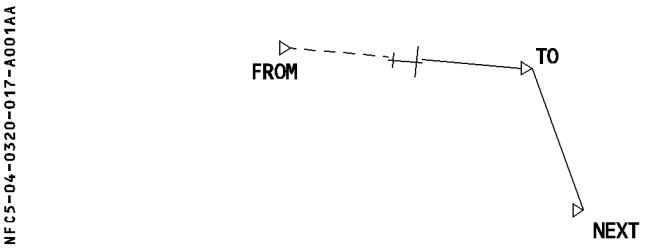
Line 6, DEST UTC/TIME DIST, EFOB

DIST is the distance to the destination along the displayed flight plan.

EFOB is the estimated fuel on board at destination.

R The sixth line is permanent, and is displayed in a white font once
R predictions are available, except when a TMPY F-PLN is displayed
R or, in some cases, when an ALT CSTR is entered ("*CLB or DES*"
R prompt appears).

Note : The predicted altitude at a waypoint is related to the QNH below the transition altitude, and is given as a flight level above the transition altitude.



The generic flight plan page displays the FROM waypoint (last waypoint to be overflown) on the first line, and the TO waypoint (in white) on the second line. The FROM/TO flight plan leg is called the active leg.

The flight crew can use the scroll keys to review all flight plan legs down to the last point of the alternate flight plan. The AIRPORT key serves as a fast slew key. The pilot can press it to call up the next airport (DEST, ALTN, ORIGIN) to be displayed on the flight plan page.

In order to return to the beginning of the flight plan page, the pilot presses the F-PLN key on the MCDU console.

The display shows the name of the leg between two waypoints and the distance between them on a line between the lines that identify them. During an approach, this in-between line also defines the angle of the final descent path. For example, "2-3°" indicates that the leg is two nautical miles long, and the flight path angle is –3°.

The display shows the bearing between FROM and TO waypoints, as the bearing from the aircraft position to the TO waypoint. It shows track (TRK) between the waypoints shown in lines 2 and 3. This is the outbound track of the next leg.

If the database contains a published missed-approach procedure, or if someone has inserted one manually, the display shows it in blue after the destination runway identification. It turns green when the go-around phase becomes active.

After the last waypoint of the missed approach, the display shows the alternate flight plan in NAV mode.

When airborne, the flight crew can clear or modify the TO waypoint by using the DIR key on the MCDU console.

Predictions

The system calculates and displays predictions for all waypoints.
It uses current wind to compute predictions for the TO waypoint, and uses predicted winds for computing all others.

Constraints

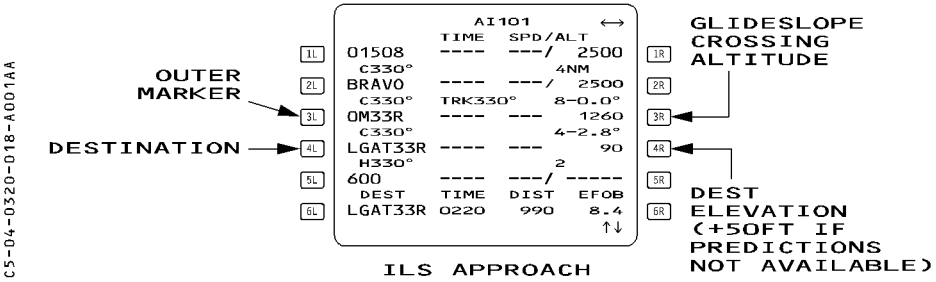
The database may define an altitude constraint and speed constraint for each waypoint of the climb, descent, and approach phases, or the pilot may insert such constraints manually. (Except at origin, destination, FROM and pseudo waypoints).
The constraints are displayed in magenta as long as predictions are not completed.
Once predictions are available, constraints are replaced by speed and altitude predictions preceded by stars. If the star is magenta the system is predicting that the aircraft will match the constraint (altitude within 250 feet, speed not more than 10 knots above the constraints). If the star is amber, the system is predicting that the aircraft will miss the constraint and the MCDU displays "SPD ERROR AT WPT" message.

Pseudo waypoints

Pseudo waypoints are geographical positions corresponding to an event in the vertical flight plan ; T/C (top of climb), T/D (top of descent), SPD/LIM (speed limit), DECEL (deceleration for approach) etc. The display shows them as waypoints in parentheses.

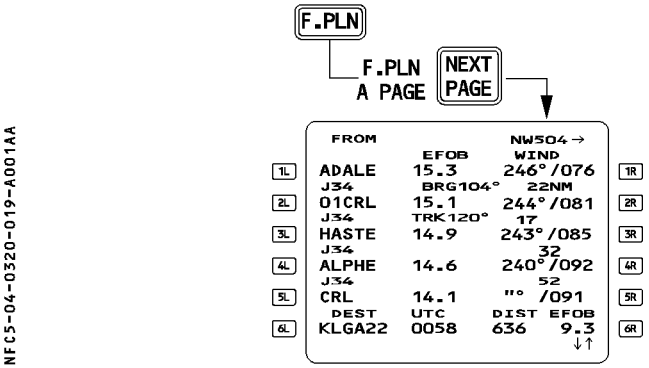
R **Approach display**

R The flight crew cannot enter an altitude constraint at destination or Missed Approach Point
R (MAP).
R



FLIGHT PLAN B PAGE

This page displays fuel predictions and forecast winds at each waypoint.
The pilot calls it up by pressing the NEXT PAGE key when the display is showing the A page.



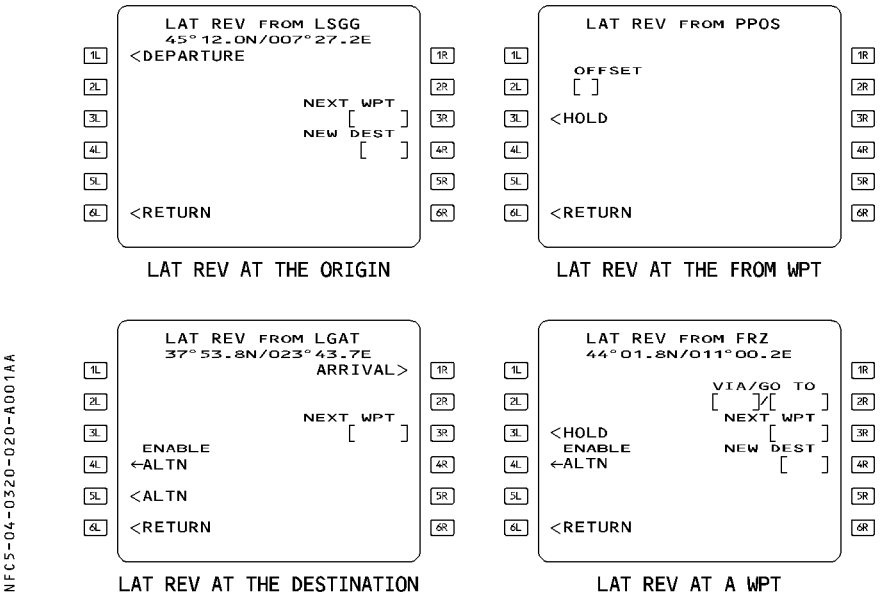
NFCS-04-0320-019-A001AA

TITLE	FLIGHT NUMBER (blank if no flight number has been entered)
Line 1 WPT-EFOB-WIND to Line 5	These lines display consecutive waypoints and associated fuel predictions, and the forecast wind profile. The direction of forecast winds is relative to true north. Forecast winds include winds entered by the pilot (large font) and the resulting interpolated winds at intermediate waypoints (small font).
Line 6 DEST-UTC/DIST-EFOB	Identical to F-PLN A page.

Note : The system interpolates manual wind entries in order to forecast winds throughout the flight plan.

LATERAL REVISION PAGES

These pages give the pilot a list of the lateral flight plan revisions he can use to change the flight plan beyond a selected waypoint.
The pilot calls up these pages from the flight plan pages (A or B) by pressing the left key adjacent to the selected waypoint.
Different lateral flight plan revisions are available for different waypoints.



NFC5-04-0320-020-A001AA

TITLE	The ident of the waypoint or airport selected for revision, along with its latitude and longitude. If the selected waypoint is the FROM waypoint, the title omits the aircraft latitude and longitude, and displays “PPOS” (present position) instead.
[1L] DEPARTURE	This prompt gives the pilot access to the departure pages, where he can select runways, SIDs, and TRANSs and insert them.

[2L] OFFSET [ ] This prompt allows the pilot to enter a lateral offset, left or right, in the flight plan.
The offset may be from 1 to 50 NM.
When the pilot enters an offset, the OFFSET field becomes yellow, and the 6L and 6R fields display ERASE and INSERT.
The pilot can delete an inserted offset by pressing the CLR pushbutton, by entering a zero for the amount of the offset, or by selecting a DIR TO.

[3L] HOLD This prompt gives the pilot access to the hold pages.

[4L] ENABLE ALTN This prompt allows the pilot to switch to the alternate flight plan at the selected revision waypoint and use it as a new active flight plan.
The system never displays this prompt at the FROM waypoint.

[5L] ALTN This prompt gives the pilot access to alternate airport page.
The system displays it only at the destination.

[6L] RETURN This prompt returns the display to the flight plan page.

[1R] ARRIVAL The pilot uses this prompt to call up the arrival pages, where he can select and insert RWY, APPR, STAR TRANS and VIA.

[2R] VIA/GOTO (1) This prompt allows the pilot to insert an airway (VIA) between the revised waypoint and another waypoint (GOTO)

[3R] NEXT WPT (1) The pilot uses this prompt to enter the next waypoint.

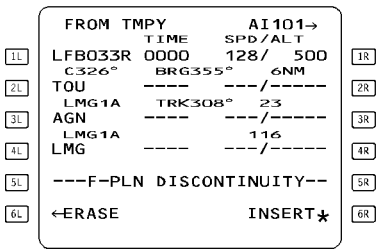
[4R] NEW DEST (1) The pilot uses this prompt to enter a new destination.

[6R] INSERT The system displays this prompt when the pilot has created a temporary flight plan.
The pilot can use it to activate the temporary flight plan.

(1) For details, see the chapter 4.04.

TEMPORARY REVISION

When the pilot selects a lateral revision, the system creates a "Temporary F-PLN" and displays it in yellow on the MCDU and as a yellow dashed line on the ND to allow the pilot to review the data before inserting. As long as the temporary flight plan is not inserted, the previous flight plan is still active and the system guides the aircraft along it.

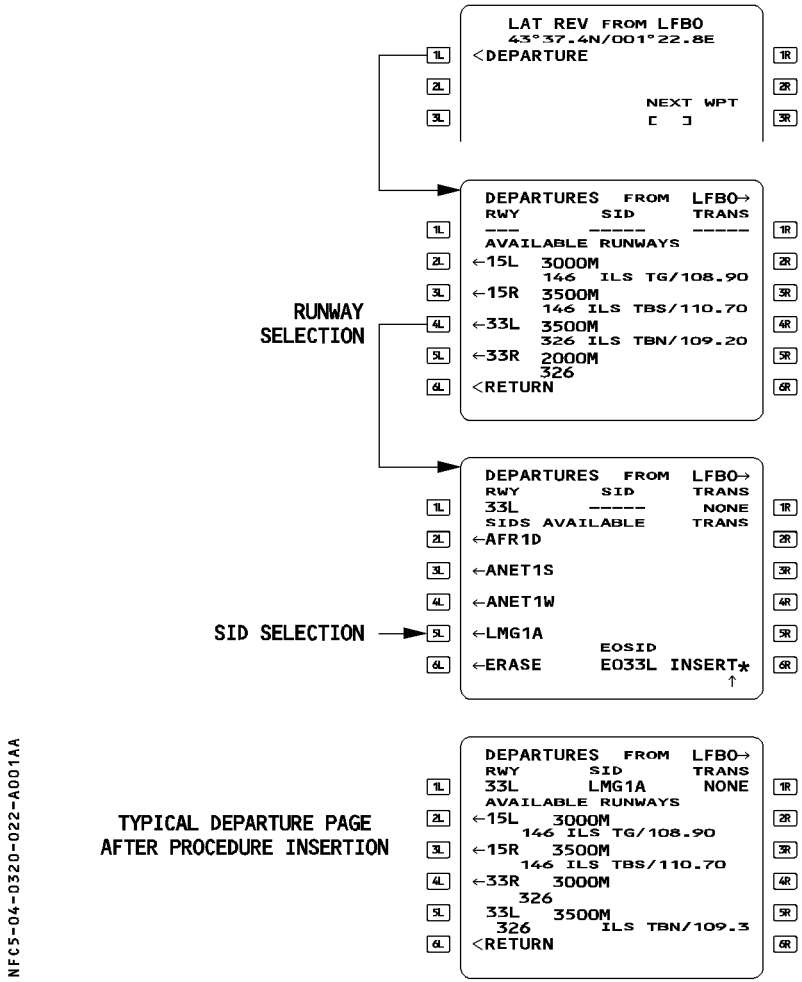


TEMPORARY F-PLN A PAGE

NFC5-04-0320-021-A001AA

DEPARTURE PAGES

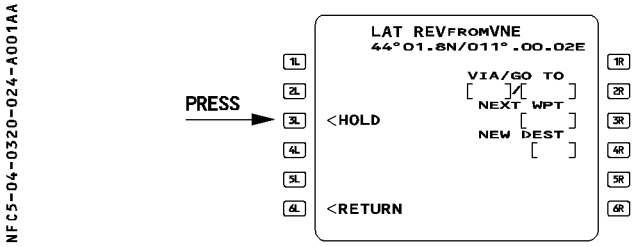
These pages allow the pilot to review departure procedures (RWY, SID, TRANS) and enter them into the active flight plan.
The pilot calls them up by pressing the 1L key when the display is showing the lateral revision page for the origin.
Three pages are available : RWY, and SIDS and TRANS (if any).
The pilot calls up each page sequentially either by selecting a data item (such as RWY) or by pressing the NEXT PAGE key on the MCDU console.



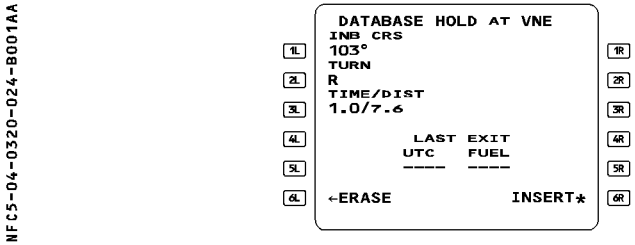
	Line 1 RWY, SID TRANS	This line displays the RWY, SID, and TRANS in green after they have been inserted into the active flight plan. They are displayed in yellow, if selected but not yet inserted. If nothing has been selected or inserted, the line displays dashes.
R	[2L] RWY/SIDs to [5L]	These fields display selectable and selected RWYs or SIDs (including EOSID and NO SID option). The pilot can slew each list. Selectable RWYs and SIDs are displayed in blue with an arrow. Once a RWY or SID is selected, the arrow disappears. A RWY or SID, already inserted in the flight plan, is displayed in green. The display shows the length, heading, and, if available, the ILS ident and frequency for each runway.
	[6L] ERASE or RETURN	The pilot presses this key to erase a selected data item and revert to the previous selection. If the pilot erases the page, the display reverts to the active flight plan page. The display shows RETURN, instead of ERASE, when the pilot has not created a temporary flight plan.
	[2R] TRANS to [5R]	This field displays the selectable and selected enroute transitions in blue and green respectively. They are blank, if there are no transitions.
	[6R] INSERT or BLANK	The pilot uses this key to insert a temporary procedure into the flight plan. The page reverts to the active flight plan page when the insertion is completed. It is associated with RETURN (6L).
	[6M] EOSID	Once a runway is inserted into the flight plan, this field displays any ENG OUT SID for that runway. If there is none, it displays NONE.

HOLD PAGES

These pages allow the pilot to review and modify the holding pattern parameters at the selected revise waypoint. The holding pattern data may come from the data base or may be defaulted to standard dimensions.
The pilot calls up these pages by pressing the HOLD key on the LAT REV page for the waypoint. Three different HOLD pages are available :



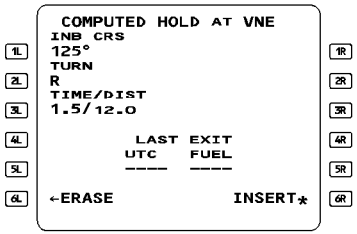
- **DATABASE HOLD AT...**
  The data base has a holding pattern for the selected revise waypoint, but has not been inserted in the flight plan yet.



- **COMPUTED HOLD AT...**

  The database has no holding pattern for the selected revised waypoint.
  The system proposes default holding pattern data.

NFC5-04-0320-025-A001AA



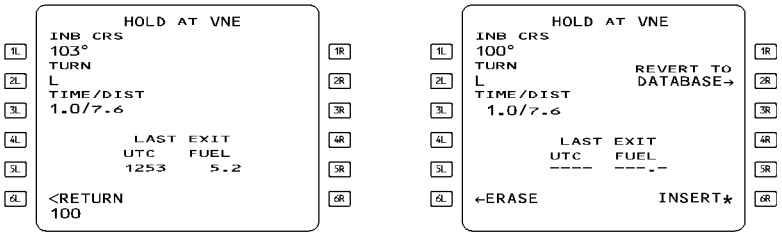
INB CRS = INBD TRK of the F-PLN leg leading to the revised waypoint.
TURN = Turn direction right.
TIME on outbound leg is 1.5 minutes above 14000 feet, 1 minute below 14000 feet.
[2R] field shows "REVERT TO COMPUTED", when the pilot has modified the holding pattern.

- **HOLD AT...**

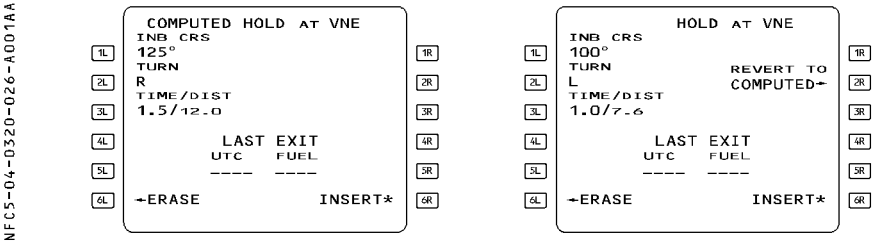
  The flight plan contains a holding pattern that was defined by the pilot from an existing database or computed hold.
  If the pilot has modified holding pattern data from the database, the field next to [2R] displays "REVERT TO DATABASE" or "REVERT TO COMPUTED", to enable the pilot to revert to default parameters.

R

NFC5-04-0320-025-B001AA

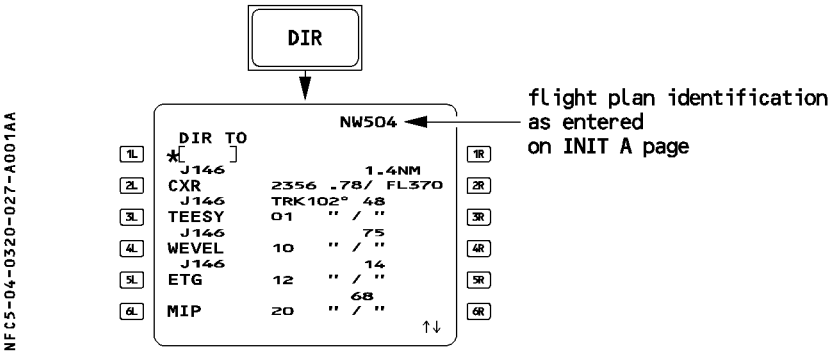


Example : The pilot modifies the inbound course.



[1L] INB CRS	This field displays the inbound course of the holding pattern. The data may be modified.
[2L] TURN	This field shows the direction to turn in the hold (L or R). The data may be modified.
[3L] TIME/DIST	This field shows the time and distance for the outbound leg. The data may be modified. Time and distance are dependent values that the system calculates from the predicted true airspeed which, in turn, depend upon the holding speed (speed for maximum endurance, ICAO speed limit, or constraint speed, whichever is lower).
[6L] ERASE or RETURN	The pilot presses this key, when the field shows “ERASE”, to erase the holding pattern. The pilot presses this key, when the field shows “RETURN”, to return to the LAT REV page, if the hold is already inserted in the flight plan.
[2R] REVERT TO DATABASE or REVERT TO COMPUTED	The pilot presses this key to delete manual modifications to the database hold (or computed hold), and to revert to the database (or computed) holding data.
[6R] INSERT	The pilot presses this key to insert the hold into the active flight plan.
LAST EXIT UTC FUEL	This field displays the time at which the aircraft must leave the holding pattern, in order to meet fuel policy criteria (extra fuel = 0). The system also displays the estimated fuel on board at that time.

DIRECT TO PAGE



Pressing the "DIR" key under the MCDU screen brings up this page. The [1L] key on this page is the DIR TO key. The pilot presses it to modify the flight plan by creating a direct leg from the aircraft's present position to any selected waypoint. When in NAV mode, the pilot must use this key to modify the active leg or the TO waypoint. Pilot cannot call up this page when the aircraft's present position is not valid.

[1L] DIR TO — Pressing this key activates the DIRECT TO function, routing the aircraft from present position to the waypoint inserted in the scratchpad. The pilot can identify the waypoint to be inserted by using its identifier, its latitude and longitude, place/bearing/distance, or place-bearing/place-bearing.

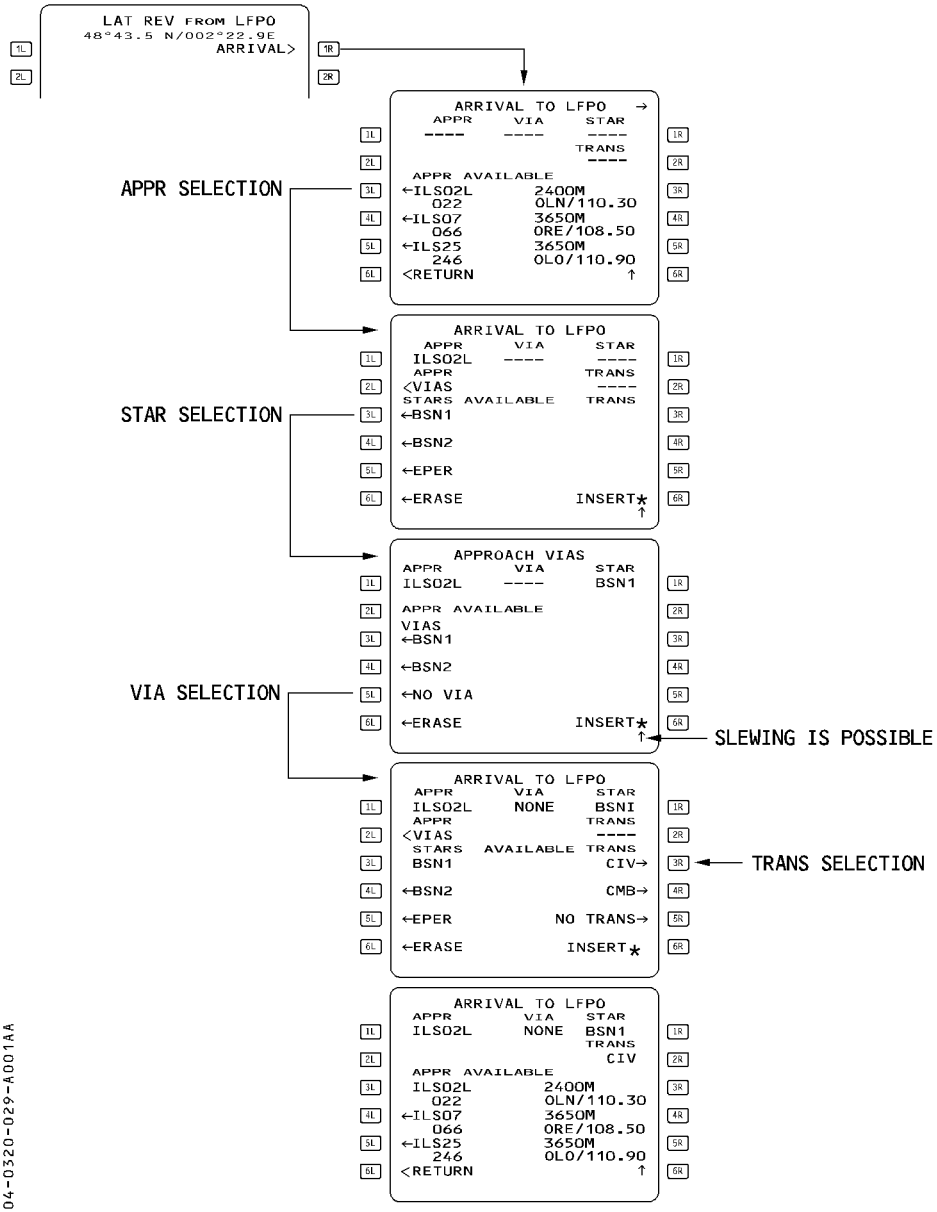
Line 2 to Line 6 — These lines display the active flight plan with time/speed/distance predictions. The display may be slewed ↑↓.
Pressing any key activates the DIRECT TO function from present position to the waypoint adjacent to that key.

R

ARRIVAL PAGES

These pages allow the pilot to review arrival procedures (approaches, VIAs, STARs, TRANS) and enter them into the active flight plan.
The pilot calls them up from the LAT REV page for the destination by pressing 1R key.
Three pages, APPR, STAR, and VIA, are available, along with a fourth, TRANS, if there are any transitions.
The pilot calls up each page sequentially either by selecting a data item (such as APPR) or by pressing the NEXT PAGE key on the MCDU console.

Line [1L] - [1R] [2R]	This line displays the APPR, VIA, STAR, and TRANS in green if they have been inserted in the flight plan, and in yellow, as temporary flight plan, if they have been selected but not yet inserted. It displays dashes or NONE if nothing has been selected or inserted.
[2L] APPR VIAS	The pilot presses this key to call up transitions from the last point of the STAR to first point of the approach.
[3L] to [5L]	These fields list selectable and selected APPRs, STARs, and VIAs. The flight crew can slew the pages, when necessary. Selectable APPRs, STARs, and VIAs are displayed in blue with an arrow. Once the pilot has selected an APPR, STAR, or VIA, the arrow disappears. After the APPR, STAR, or VIA is inserted into the flight plan, it is displayed in green. For each approach the display shows runway length, heading, and the frequency and identifier of the ILS when ILS is available.
[6L] ERASE or RETURN	The pilot presses this key to erase selected data and revert to the previous selection. The page reverts to the LAT REV page. The field displays “RETURN” instead of ERASE when the flight crew has not created a temporary flight plan.
[3R] TRANS to [5R]	These fields display selectable and selected en route transitions (if any). They are blue when selected, and become green when inserted into the active flight plan.
[6R] INSERT	The pilot presses this key to insert the temporary procedure into the active flight plan. The page reverts to the active flight plan page when this happens.

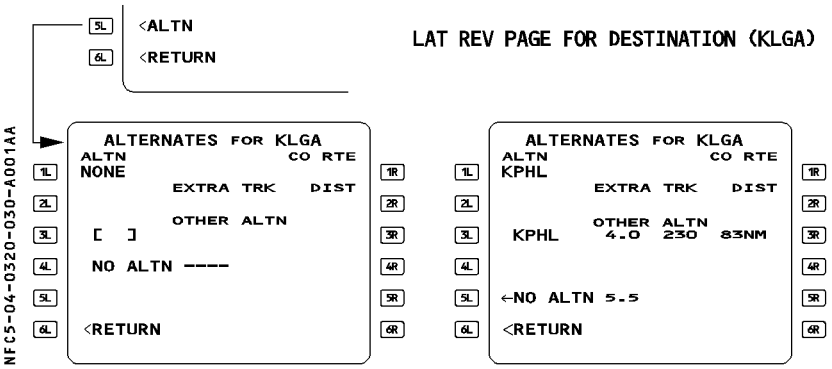


TYPICAL ARRIVAL PAGE
WITH SELECTED DATA

NFCS-04-0320-029-A001AA

ALTERNATE PAGE

This page enables the pilot to review, in the NAV database, the alternate airports that are paired with the destination, and define additional alternates, if needed. (Alternate airports are linked to the destination). The pilot calls up this page with the ALTN prompt, from the lateral revision page for the destination.



TITLE — The destination airport is displayed in large green font.

[1L] ALTN — This field displays the selected alternate : In green, if it is active ; in yellow, if it is temporary. “NONE” is displayed, if NO ALTN option is selected, or if the destination has no alternate.

Line 2 to line 5 — These lines display the identifications of alternates (up to 6), the extra fuel weight remaining after landing at the alternates, and the great-circle track and the distances to them from the destination.
If the database contains a company route between the destination and the alternate, the distance shown is an airway distance (not a great-circle distance).
When the database defines a preferred alternate, it is displayed on line 2 (if no scrolling has been performed).

R

[4L] OTHER ALTN — The pilot can enter an airport identifier in the brackets (Line 3). If that airport is not stored in the data base, the NEW RUNWAY page appears for the pilot to use in defining it.
If it is stored in the data base, the ROUTE SELECTION page appears, and the pilot can use it to select the best route.
The pilot may enter a distance in the DIST field of the OTHER ALTN prompt in order to get preliminary fuel predictions. However, once he has selected the alternate airfield as a temporary alternate and then inserted it, the ALTN distance reverts either to the airway distance if he has selected a company route, or otherwise to the direct distance to the alternate.
The pilot can use OTHER ALTN to overwrite and replace the previous OTHER ALTN.

NO ALTN — The pilot uses this key to select the NO ALTN option.

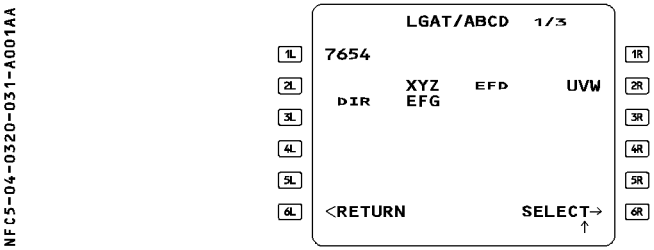
[6L] RETURN or ERASE — The pilot presses this key to make the display revert to the LAT REV page.
Pressing this key erases the temporary selection.

[1R] CO RTE — The pilot presses this key to display the active company route between the destination and the selected alternate.

[6R] INSERT — Pressing this key activates the temporary selection.

ROUTE SELECTION PAGE FOR ALTERNATE

This page allows the pilot to review the company route between the destination and the alternate, and select a different route, if that seems appropriate.
This page comes up automatically when the flight crew enters an ident in the OTHER ALTN field.
See "Route Selection" page for a description of this page.

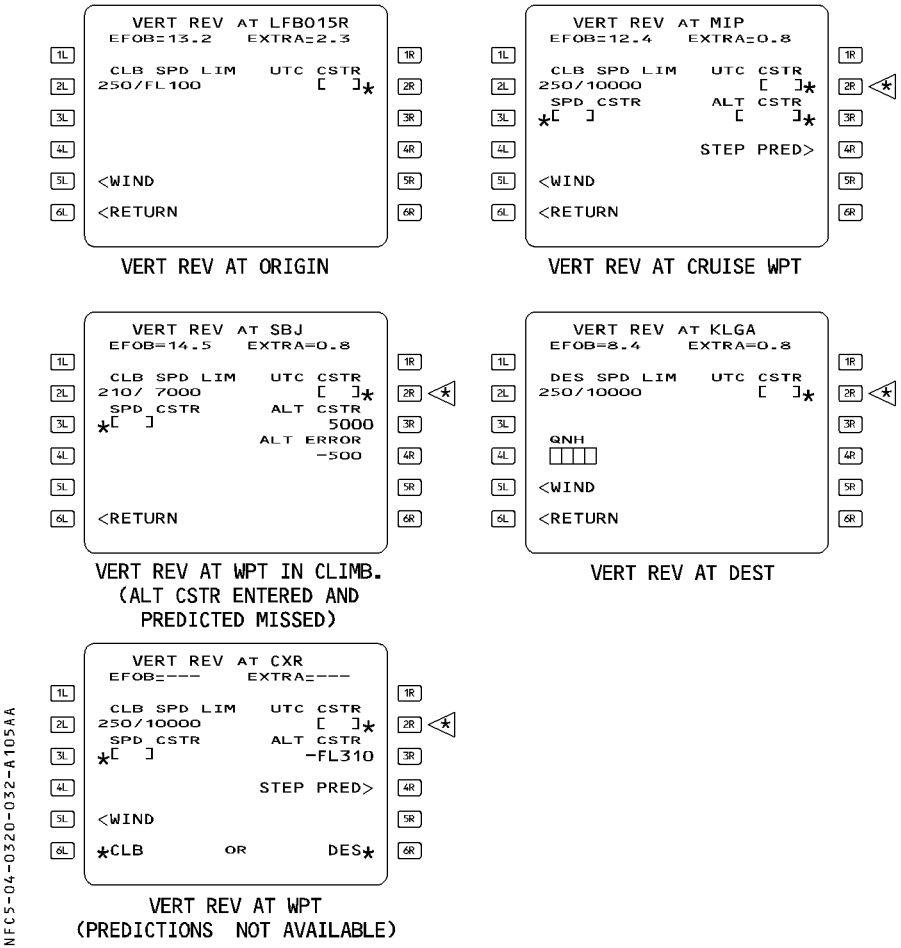


NFCS-04-0320-031-A001AA

[6R] SELECT — When the pilot presses this key the display reverts to the alternate page. (The distance between the destination and the alternate is then the airway distance).

VERTICAL REVISION PAGES

These pages contain the menu of available vertical flight plan revisions that can be applied at a selected waypoint.
The pilot calls up these pages from the flight plan A or B pages, by pressing the righthand key next to the selected revise waypoint.
The flight crew may make several different vertical revisions (although some may not be available at all waypoints) : Speed limit, speed constraint, altitude constraint, wind, estimated takeoff time, step climb, and step descent.



NFCS-04-0320-032-A105AA

	TITLE	"VERT REV AT [location]" (Second line shows remaining fuel and extra fuel at the revised waypoint).
	[1L] "TOO STEEP PATH BEYOND" (amber)	This message is displayed if the waypoint is part of a leg with too steep a descent path.
	[2L] CLB/DES SPD LIM (magenta)	This field displays the speed limit applicable to the climb or descent phase. It displays it in a large font when data has been inserted manually and in a small font when data comes from the database. The speed limit comprises a speed and an altitude.
R R		
	[3L] SPD CSTR (magenta)	This field displays any speed constraint assigned to the revised waypoint. It applies to climb and descent waypoints. It is in a large font when inserted manually, and in a small font when it comes from the database. It is not displayed at the origin airport, a FROM waypoint, a speed limit pseudo waypoint, or the destination airport.
R R		
R	[4L] QNH	This field functions only when the revised waypoint is the primary destination. It allows the pilot to enter the sea-level atmospheric pressure. This field is identical to the QHN field of the PERF APPR page.
R	[5L] WIND (blue)	The pilot press this key to access to the wind pages. Any wind direction entry into the wind pages, should be relative to true north. The first wind page that is displayed, corresponds to the selected waypoint e.g. climb page if the selected waypoint is a climb phase waypoint. A CLR action reverts it to brackets.
R R R		
	[6L] RETURN or CLB	The pilot presses this key to return to the last displayed flight plan page. When displayed, pressing this key assigns the constraint to CLB phase and inserts it into the vertical flight plan. The page reverts to the flight plan page.

[2R] UTC CSTR

This field displays this legend at all waypoints except the FROM waypoint.

- At origin it enables the pilot to enter an estimated takeoff time.
- At any waypoint it enables to enter one time constraint. (Only one for the entire flight plan).
  It will be entered as HH MM (HH hours, MM minutes). Maximum entry is clock time + 20 hours.

[3R] ALT CSTR (magenta)

This field displays the altitude constraint assigned to this revise waypoint.

It uses a large font when the constraint is entered manually, a small font when it is from the data base.

A CLR action reverts it to brackets.

The constraint may be :

- "At", entered as XXXXX (FL180, for example)
- "At or above", entered as + XXXXX or XXXXX + (+ FL310, for example)
- "At or below", entered as – XXXXX or XXXXX – (– 5000, for example)
- A "window" constraint.
  The altitude window consists of two altitudes between which the aircraft should fly. The crew cannot manually enter a "window" constraint.

[4R] ALT ERROR (green)

When the aircraft misses a predicted altitude constraint, this field displays the difference between the altitude constraint and the predicted altitude.

If, for example, "– 500" appears in this field in green, the aircraft will reach the waypoint at an altitude 500 feet below the constraint altitude.

or

It applies only to waypoints in the climb and descent phases.

STEP PRED

This legend appears for waypoints in the cruise phase and gives the pilot access to the step prediction page.

[6R] DES

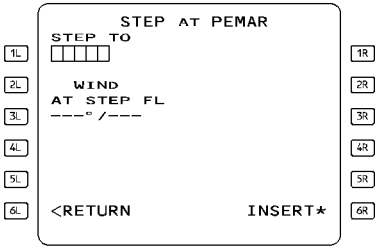
When this field displays "DES", pressing this key assigns the constraints to the descent phase and inserts them into the vertical flight plan. The page reverts to the F-PLN page. (See Note, below).

Note : Altitude and speed constraints may apply to climb, descent or approach phase, but never to cruise phase.
Fields 6L/6R display "CLB/DES" when the revise waypoint is a cruise phase waypoint and the FMGS needs to know if the new constraint is to be applied in climb or descent phase. The FMGS will modify the cruise phase accordingly.
These 2 prompts also display "CLB/DES" when the predictions are not computed. (top of climb and top of descent not yet defined).

STEP PRED PAGE

This page allows the pilot to insert a step climb or a step descent altitude into the flight plan.
The pilot calls it up from the vertical revision page by pressing the STEP PRED prompt, which is displayed at all fixed waypoints of the cruise segment except the FROM waypoint.

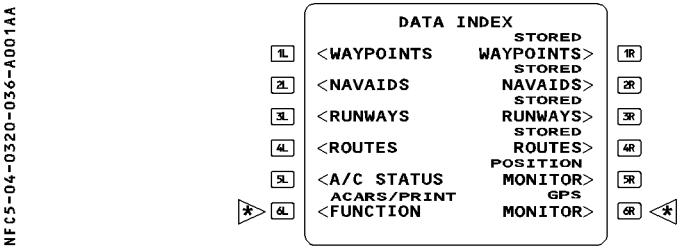
NFC5-04-0320-035-A001AA



TITLE	STEP AT — (the selected vertical revise waypoint at which the step is to be initiated)
[1L] STEP TO [boxes]	This is the step altitude entry field. If the step altitude is higher than the cruise flight level, the step is a step climb. If the step altitude is lower than the cruise flight level, the step is a step descent.
[3L] WIND AT STEP FL — °/ —	This field allows the flight crew to enter and display a wind for the step altitude. This can be the wind as calculated by the FMGC (small blue font) or as entered by the pilot (large blue font). If the flight crew clears a pilot-entered wind, the value reverts to the calculated wind. The pilot cannot clear the calculated wind.
[6L] RETURN	If the pilot presses this key the page reverts to the previously displayed vertical revision page.
[6R] INSERT	If the pilot presses this key the system inserts the step and reverts to flight plan page.
or DELETE STEP	This prompt is displayed after a step FL entry only. If the pilot presses the key while this legend is showing, the step is deleted and the display reverts to the vertical revision page.

DATA INDEX PAGE

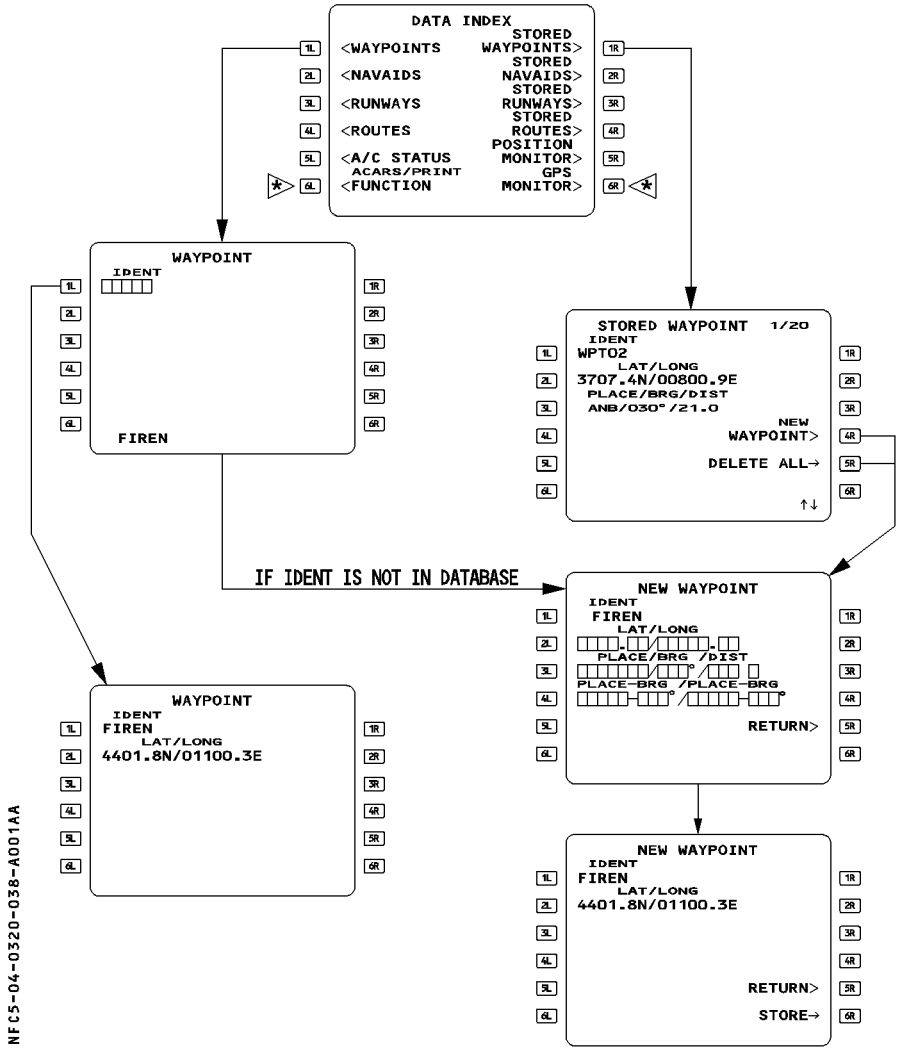
This page lists the navigation data entered in the FMGS.
The pilot enters those items labeled "stored" and can modify them. The pilot can call up the others, but cannot modify them.
The pilot calls up this page by pressing the DATA key on the MCDU console.



[1L] WAYPOINTS [2L] NAVAIDS [3L] RUNWAYS [4L] ROUTES	These keys call up descriptions of waypoints, navaids, runways, and routes stored in the data base so that the pilot can review it.
[5L] A/C STATUS	This key calls up the aircraft status page.
[6L] ACARS/PRINT ◁ FUNCTION	This key calls up the PRINT function pages and the ACARS function pages.
[1R] STORED WAYPOINTS [2R] STORED NAVAIDS [3R] STORED RUNWAYS [4R] STORED ROUTES	These keys call up waypoints, navaids, runways, and routes that the flight crew has stored, allowing the crew to review them and to store them in or delete them from the data base. They are erased automatically in the done phase when a specific pin program is activated.
[5R] POSITION MONITOR	When the flight crew presses this key, the display shows all essential navigation data.
[6R] GPS MONITOR ◁	This key calls up the GPS MONITOR page. Displayed if the GPS option is installed.

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WAYPOINT/STORED WAYPOINT/NEW WAYPOINT PAGES



WAYPOINT PAGE

– The pilot can call up this page by pressing the 1L key, on the DATA INDEX page. The display then shows waypoint information associated with the identifier the flight crew inserts in the [1L] field.
From this page, it is possible to call up any waypoint not stored in the stored waypoint list, if they belong to the active, temporary, or secondary flight plan.

STORED WAYPOINT PAGE

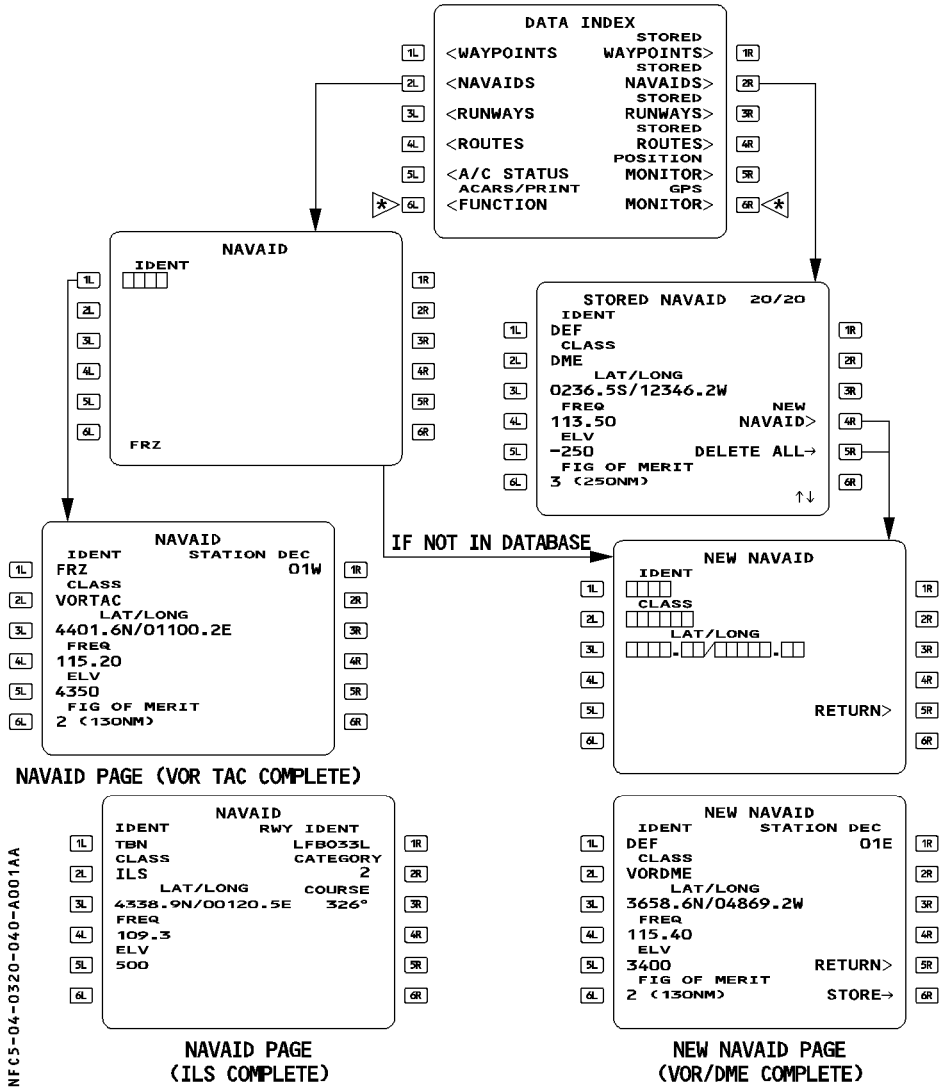
The pilot calls up this page by pressing the 1R key, on the DATA INDEX page.
This page displays waypoints defined and stored by the pilot. It lists each stored waypoint, alongwith a number that shows the relative order in which it was inserted in the database. This number is displayed in the upper righthand corner of the page. For example, "1/20" indicates that the waypoint was the first of 20 stored.

R	[1L] IDENT	To delete a waypoint, the pilot clears the 1L ident display.
R	[2L] LAT/LONG	Latitude and longitude of the waypoint are displayed in this field.
R	[3L]	This field displays either a PLACE/BRG/DIST or a PLACE-BRG/PLACE-BRG, depending on how the waypoint was defined.
	[4R] NEW WAYPOINT	The pilot presses this key to call up the NEW WAYPOINT page.
	[5R] DELETE ALL	The pilot presses this key to delete all the waypoints stored by the flight crew, except those currently used in the active or secondary flight plan. ("F-PLN ELEMENT RETAINED" appears on the MCDU).

NEW WAYPOINT PAGE

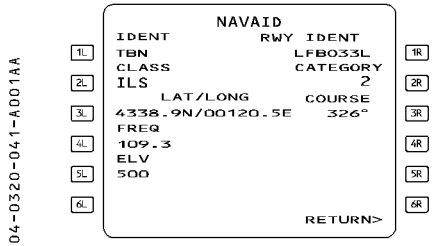
– The pilot calls up this page by pressing 4R, on the STORED WAYPOINT page.
R – The pilot can use this page to define and store up to 20 waypoints. Entering an additional
R waypoint deletes the first one.
The pilot defines a waypoint by entering its ident in the data field next to 1L, then by entering its position in the amber boxes : Latitude and longitude, place/bearing/distance from a waypoint (or place) in the database, or place-bearing/place-bearing (bearings from two different waypoints in the database).
The STORE prompt appears next to 6R when the boxes are filled in, and the pilot presses the key to store the waypoint in the database.
If the pilot enters the waypoint's position as place/bearing/distance, or place-bearing/place-bearing, the FMGC computes its latitude and longitude.

NAVAID/STORED NAVAID/NEW NAVAID PAGES

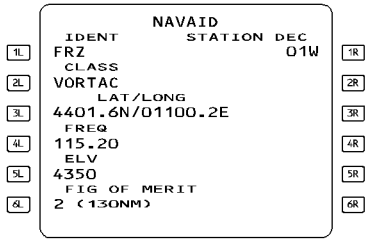


NAVAID PAGE

The pilot calls up this page by pressing 2L on the DATA INDEX page.
This page displays the navaid information associated with the identifier the pilot inserts in the [1L] field.



NAVAID PAGE (ILS)



NAVAID PAGE (VOR TAC)

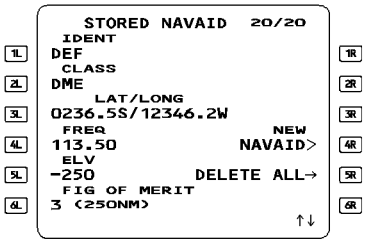
NFCS-04-0320-041-A001AA

	[2L] CLASS	This field identifies the navaid as VOR, DME, VOR DME,
R		VORTAC, NDB, LOC, ILS, or ILS DME.
	[4L] FREQ	This field displays the frequency of the selected navaid.
	[5L] ELV	This field gives the elevation of the navaid in feet above sea level. It is not displayed for VOR or NDB.
	[6L] FIG OF MERIT	This field shows how far out the FMGS can autotune a VOR, VOR/DME, VORTAC, or DME for display or for computing position. 0 : up to 40 NM 1 : up to 70 NM 2 : up to 130 NM 3 : up to 250 NM
	[1R] STATION DEC or RWY IDENT	This is the magnetic declination in the navaid area (used only for VOR, VOR/DME, and VORTAC). The field displays this, if the navaid is an ILS or ILS/DME.
	[2R] CATEGORY	This field shows the navaid's category, if it is an ILS or ILS/DME.
R	[3R] COURSE	This is the localizer course, if the navaid is an ILS or a LOC.
	[6R] RETURN	This prompt is displayed, if the page has been accessed from the SELECTED NAVAID page. The pilot presses this key to return to the SELECTED NAVAID page.

STORED NAVAID PAGE

The pilot calls up this page by pressing the 2R key on the data index page.
He uses this page to display or delete navaids he has defined and stored.

NFC5-04-0320-042-A001AA



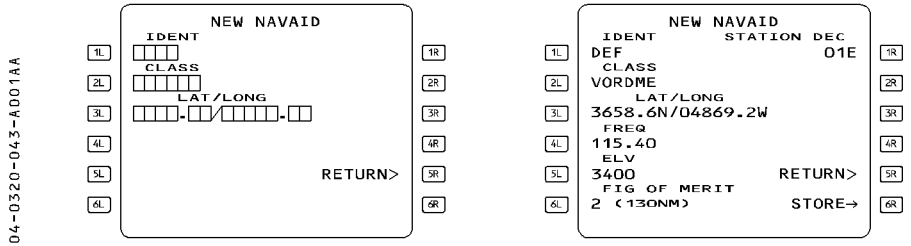
A number in the upper right hand corner of the screen shows the relative order in which the navaids were stored. (For example, 3/7 means third out of seven stored).
Slew keys give the pilot access to the different stored navaids.

[1L] IDENT — The pilot deletes a stored navaid by entering its ident in this field, then pressing the CLR key at the bottom of the MCDU control panel.

[5R] DELETE ALL — The pilot presses this key to erase all the stored navaids except those currently in use in the active or secondary flight plan. (The MCDU displays “F-PLN ELEMENT RETAINED.”).

NEW NAVAID PAGE

The pilot calls up this page by pressing 4R on the stored navaid page.



EMPTY NEW NAVAID PAGE

NEW NAVAID PAGE (VOR/DME)

NFCS-04-0320-043-A001AA

It can be used to define and store up to 20 navaids. The navaid elements must be entered in two steps :

1. Enter the data in the lines of amber boxes.
2. Enter frequency, elevation, figure of merit, and station declination or ILS category and course, if applicable.
   The STORE prompt appears next to 6R, when all the amber boxes are filled. The pilot presses 6R to store the new navaid.

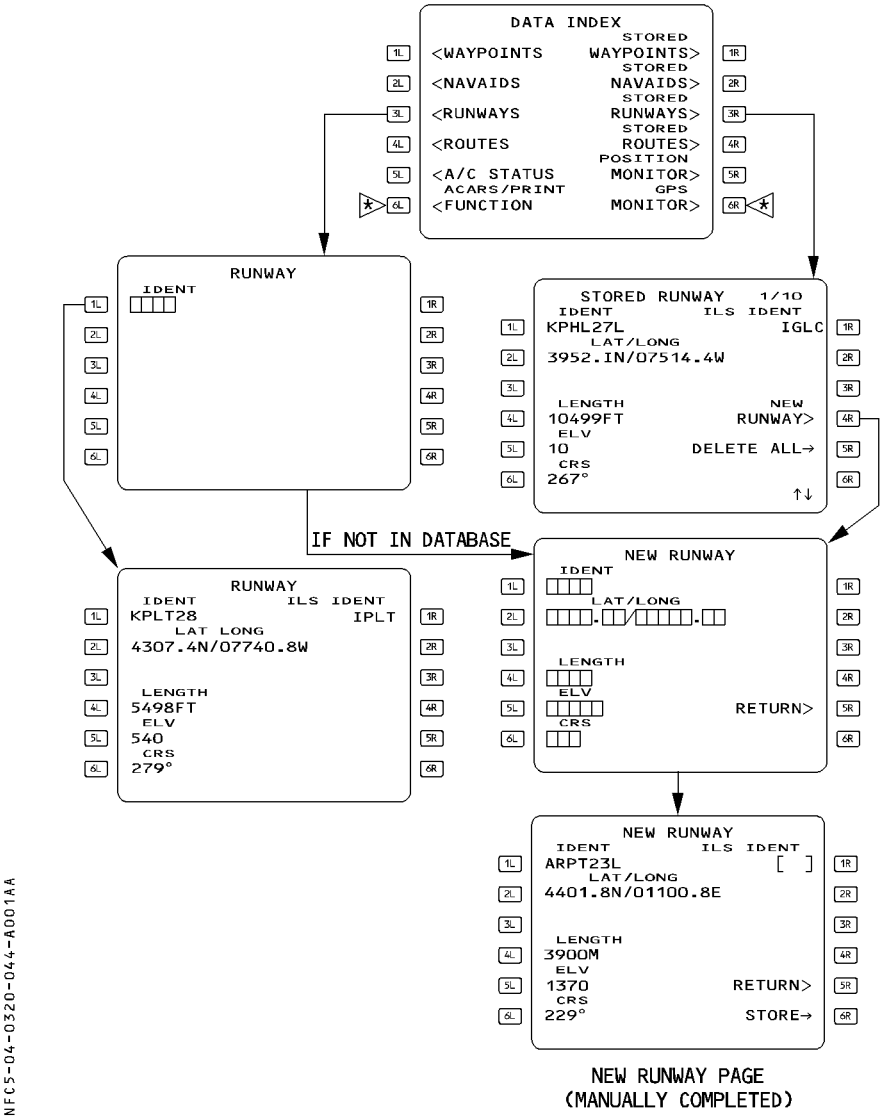
Note : The pilot cannot create an ILS/DME or an uncollocated navaid.
If the runway associated with the ILS has been entered through the new runway page, the ILS course, ILS ident, and runway ident are already displayed on the new navaid page when it comes up (copied from the new runway page). For details, see the new runway page info below.

[1R] STATION DEC — The pilot must enter the magnetic declination, if the prompt is displayed.
This prompt is displayed only for VOR, VORTAC or VORDME.

R [3R] COURSE — If the navaid is an ILS or LOC, enter the course.

R

RUNWAY/STORED RUNWAY/NEW RUNWAY PAGES



NEW RUNWAY PAGE
(MANUALLY COMPLETED)

NFC5-04-0320-044-A001AA

RUNWAY PAGE

This page displays the following information :

[1L] IDENT	The runway ident, which comprises the airport identification and the runway direction, uses six or seven digits (Example : CYYZ 24L and LFRJ 08).
[2L] LAT/LONG	The latitude and longitude of the runway threshold.
[4L] LENGTH	The runway length in meters (m) or feet (ft), in four digits (9999 ft).
[5L] ELV	The threshold elevation in feet above sea level.
[6L] CRS	The runway course (degrees magnetic).
[1R] ILS IDENT	The LOC or ILS identifier.

STORED RUNWAY PAGE

The pilot uses this page to display or delete defined and stored runways. The stored runways are listed and numbered in the order in which they were inserted. The number is displayed in the upper righthand corner of the page. (For example, 2/4 means the runway is the second of four stored runways).
The pilot can delete any stored runway from the database by displaying its ident in the 1L field, then by pressing the CLR key on the MCDU control panel.

[5R] DELETE ALL	The pilot presses this key to erase all the stored runways, except those used in the active or secondary flight plan. (The MCDU displays "F-PLN ELEMENT RETAINED").
[1L] to [6L]	These fields are similar to the RUNWAY page fields.

NEW RUNWAY PAGE

The pilot can use this page to define and store up to 10 runways.
When the pilot enters an ILS/LOC ident in the [1R] field, the new navaid page comes up. When the pilot has entered and stored the necessary data in the new navaid page, the new runway page reappears.
The new runway page and the new navaid page (ILS/LOC) are not independent :

- When the flight crew first defines the ILS/LOC (on the new navaid page), the new runway page, when called up, already displays the RWY course, RWY ident, and ILS ident (copied from the new navaid page).
- When the flight crew first defines the runway (on the new runway page), the new navaid page, when called up, already displays the ILS course, ILS ident, and runway ident.

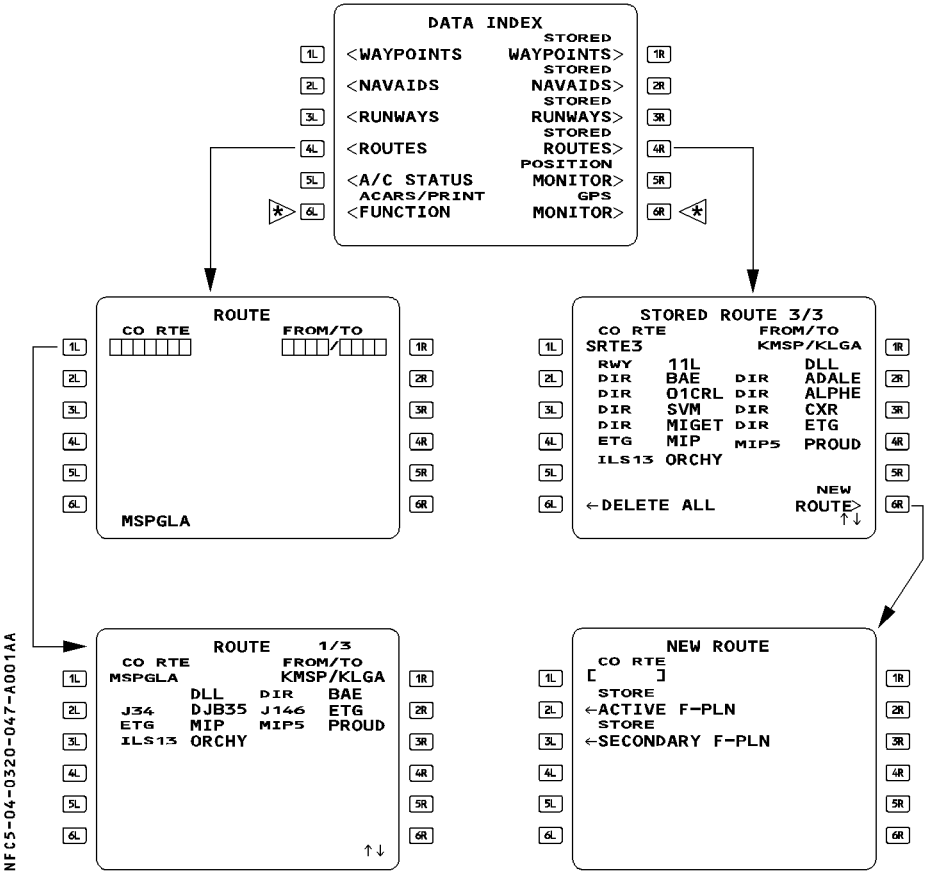
The pilot must enter the two runway directions on two different new runway pages (LFRJ 08 and LFRJ 26) to allow the flight plan to select either one.

R *Note : When 10 runways are stored, entering a new stored runway deletes the first one*
R *of the list (1/10).*

[1L] to [6L]	Enter information about the new runway.
[1R] ILS IDENT	Enter the ILS/LOC ident. The NEW NAVAID page comes up.
[5R] RETURN	When displayed, pressing this key return to NEW NAVAID page.
[6R] STORE	This prompt appears only when all the amber boxes have been filled.

R *Note :* — *The NEW RUNWAY may be used as departure or destination but no SID or STAR can be associated or stored with this runway. Therefore the pilot will use it as an "independent" airport.*
A new runway is identified by the 4 letter ICAO airport identifier although all six or seven digits must be entered.

ROUTE/STORED ROUTE/NEW ROUTE PAGES



ROUTE PAGES

(Not-modifiable)

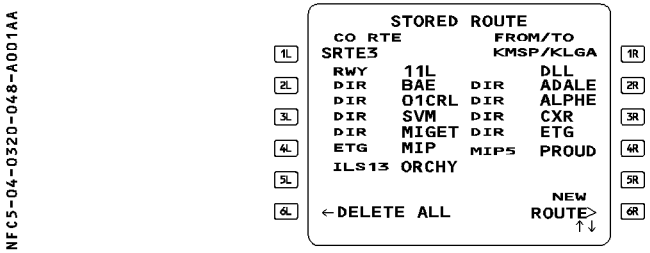
[1L] CO RTE — Any company route ident entered in this field causes all the elements of the route to be displayed.

Line 2 to Line 6 — These lines display the various elements of the route, including waypoints and airways.

[1R] FROM/TO — This field is automatically fitted when the pilot enters the ident for a company route. When the pilot enters a city pair manually, the MCDU displays "NOT IN DATA BASE" if the city pair is not in the navigation data base. If the city pair is in the data base, the CO RTE field displays the first route stored (small font, blue). If more than one route is stored, the pilot can slew to see the different routes.

STORED ROUTE PAGE

R The pilot can store up to 3 new routes.



[1L] CO RTE — This field identifies the stored route. Clearing this field deletes the stored route.

Line 2 to Line 5 — The fields in these lines are identical to the corresponding fields in the route page.

[6L] DELETE ALL — Pressing this key deletes all routes previously stored by the crew.

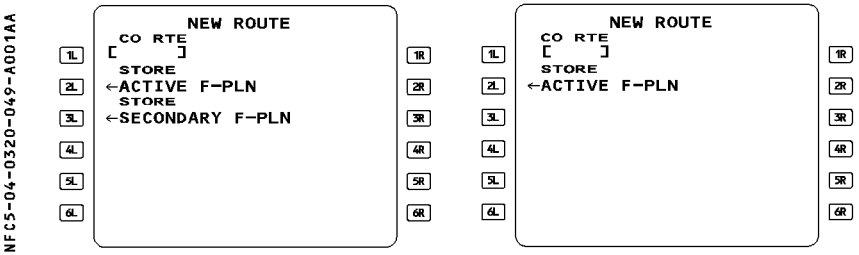
[1R] FROM/TO — This identifies the city pair of the stored route.

[6R] NEW ROUTE — Pressing this key calls up the new route page

R *Note : Stored routes are automatically erased in the DONE phase when a specific pin*
R *program is activated.*
R *When the pilot wants to enter a fourth route, the message "STORED ROUTE*
R *FULL" is displayed and a route has to be deleted prior to inserting a new one.*

NEW ROUTE PAGE

The pilot calls up this page by pressing the NEW ROUTE key on the stored route page. The pilot can use it to store up to three new routes that have been already defined in the active or secondary flight plan.



[1L] CO RTE — This field enables the pilot to enter a new company route ident. If that ident has already been assigned, the entry is rejected.

[2L] STORE ACTIVE F-PLN (blue)
Pressing this key stores parameters of the active flight plan as new route.
The display shows this prompt when the system contains a FROM/TO, but only during preflight.

[3L] STORE SECONDARY F-PLN (blue)
Pressing this key stores parameters of the secondary flight plan as new route. The display shows this prompt when the system contains a FROM/TO and the secondary flight plan has not yet been sequenced.

Note : — *If it has not already been named, a stored route is named automatically when stored : SRTE 1 or 2 or 3, for example.*

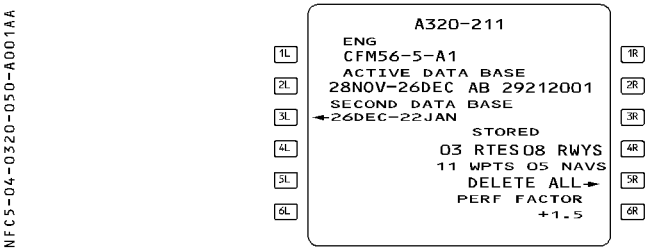
R — *When 3 routes are already stored, the pilot cannot insert a new route. The*
R *"STORED ROUTE FULL" message is displayed, and the pilot must manually delete*
R *a route in order to store a new one.*

— *Several elements of the flight plan are not retained, when the route is stored :*
- *Pilot-entered holds*
- *Offset*
- *Pilot-entered constraints*
- *Modifications to terminal procedures*
- *Pseudo-waypoints*

The MCDU then displays "REVISIONS NOT STORED".

AIRCRAFT STATUS PAGE

The system automatically displays this page at power up, but the pilot may also call it up by pressing the DATA key on the MCDU console.



TITLE — AIRCRAFT TYPE

[1L] ENGINE TYPE — The system uses this to calculate predictions.

R *Note : When the same performance database is used for different aircraft*
R *configurations, the aircraft type displayed may differ from the actual aircraft.*

[2L] ACTIVE DATABASE — The validity period and part number are displayed in large font.

[3L] SECOND DATABASE — The validity period is displayed in small font. The pilot can press the 3L key to switch to the second database as the active database.

CAUTION

Cycling the database erases the primary and secondary flight plans, as well as the stored data. The flight crew must never do this in flight.

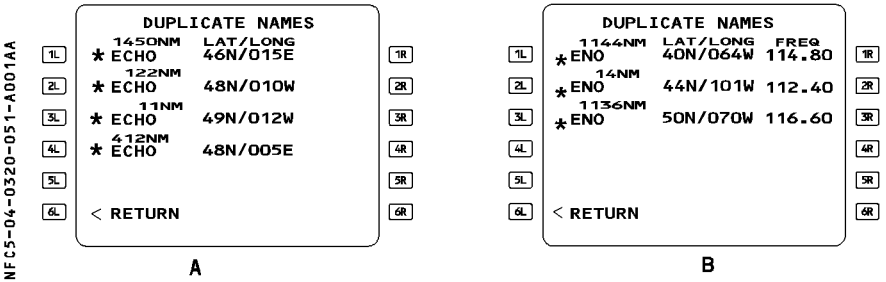
[4R] STORED — This field displays pilot-stored data in large green font. The field is blank, if no data is stored. (The system automatically erases this data at the done phase, when a specific pin program is activated).

[5R] DELETE ALL — The pilot presses this key to delete all pilot-stored data, except data that is part of the active and secondary flight plans.

[6R] PERF FACTOR — This factor can be only modified while the aircraft is on ground.

DUPLICATE NAMES PAGE

This page, which appears automatically, allows the pilot to select a specific waypoint, airport, or navaid when the data base holds more than one under the same identifier.



The pilot presses the key adjacent to a waypoint, navaid, or airport to select it as the one to be entered. When the pilot has finished, the page reverts automatically to the page displayed previously.

LAT/LONG column
This column lists the rounded off latitudes and longitudes, of the different points using the same identifier.

FREQ column
This column lists the frequencies of the navaids, if any.

DISTANCE (shown above identifier)
Each of these distances is the distance from present position to the waypoint displayed directly underneath.

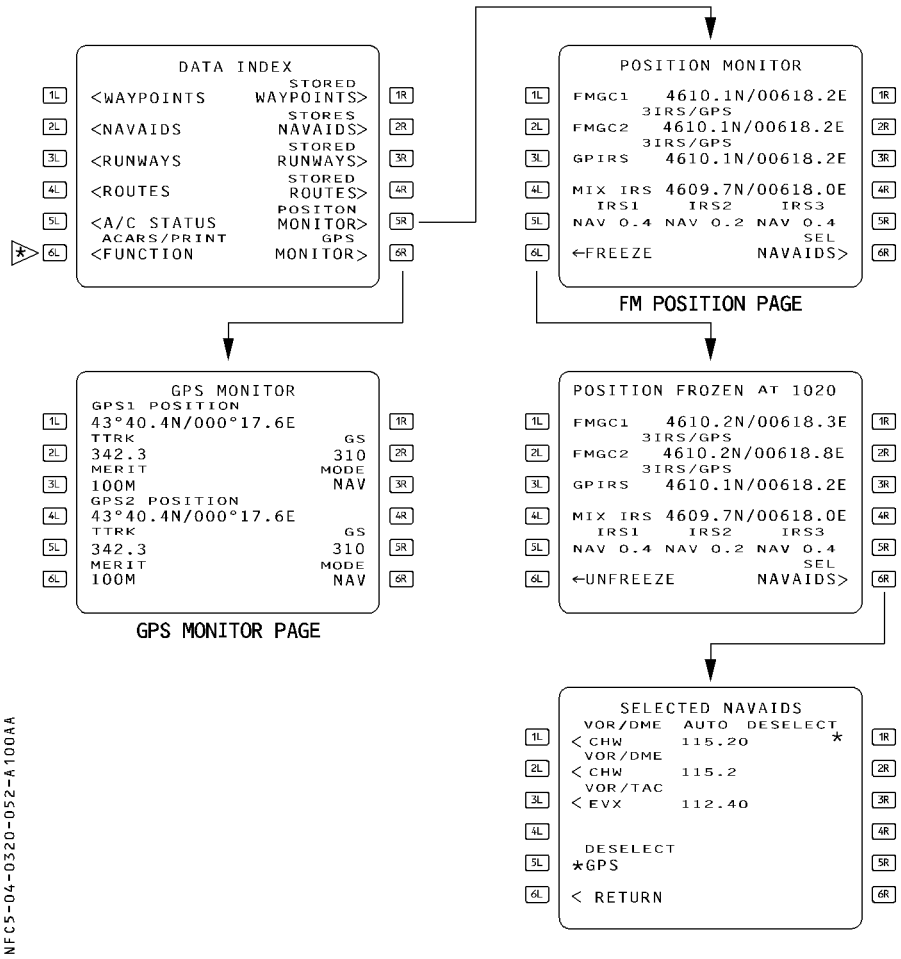
Note : The DUPLICATE NAMES page is not displayed when 2 waypoints with the same ident belongs to the same airway. The system selects the first waypoint found in the database.

POSITION MONITOR PAGE

This page displays all the different positions that the FMGC has computed with the different methods of navigation available. It also shows which method obtained each position. (The positions should be almost identical).

The pilot calls up this page by pressing the 5R key on the data index page.

R



NFC5-04-0320-052-A100AA

POSITION MONITOR AND POSITION FROZEN PAGE

R	Line 1 FMGC 1	This line displays the latitude and longitude as calculated by the onside FMGC, and the navigation methods used by the FMGC for that calculation (Example : "3IRS/DME/DME").
R	Line 2 FMGC 2	This line displays the latitude and longitude, as calculated by the opposite FMGC, and the navigation methods it used.
	Line 3 RADIO or GPS or GPIRS	This line displays the latitude and longitude calculated by the onside FMGC from selected radio navaids (Example : DME/DME, VOR/DME, or LOC) or from GPS or GPIRS.
	Line 4 MIX IRS	This line displays the latitude and longitude of the weighted mean inertial reference system (IRS) calculated by the onside FMGC from the available IRSs.
	Line 5 IRS 1,2,3	This line displays the deviation in nautical miles of each IRS position from the onside FMGC position. It also displays the IRS mode, which can be INVAL, ALIGN, NAV or ATT. *Note : INVAL is displayed when an ADIRS has failed or the IRS position is not refreshed.*
	[6L] FREEZE/UNFREEZE	The flight crew presses this key to freeze (or unfreeze) all the data displayed on the page. When the data is frozen, the title of the page specifies the time at which it was frozen.
	[6R] SEL NAVAIDS	The flight crew presses this key to access the selected navaids page.

SELECTED NAVAIDS PAGE

MODIFIABLE ONLY FOR DESELECTION

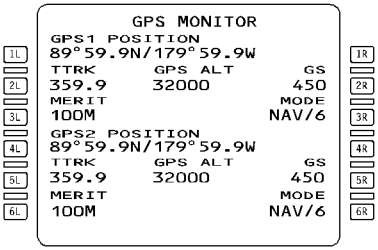
Line 1	This line displays the navaid, tuned for display purposes, and the tuning mode (AUTO, MAN, or RMP).
Line 2 and 3	These lines display the navaids, if any, tuned for the calculation of radio position and the tuning mode by the FMGC.
[4L]	This field displays the tuned ILS, if any.

[5L] DESELECT/SELECT GPS	The crew presses this key to manually select or deselect the GPS for position computation. Upon transition to the DONE phase, the prompt returns to DESELECT status. If the pilot deselects the GPS, "GPS IS DESELECTED" is displayed when the aircraft is less than 80 NM from the top of descent, or in approach phase.
[6L] RETURN	The pilot presses this key to return to the POSITION MONITOR page.
[1R] DESELECT to [6R]	The pilot deselects a navaid by entering its identifier in one of these six fields. Once deselected in this way, the navaid can no longer be tuned manually through the entry of its ident, nor can it be autotuned for display or determination of the position for the rest of the flight. The deselection is cleared : – Manually, by a CLR action into this field, or – Automatically upon transition to the done or preflight phase, or upon activation of the second database. The pilot may deselect as many as six stations.

GPS MONITOR PAGE

This page displays the GPS data. The pilot calls up this page by pressing the GPS MONITOR prompt of the DATA INDEX page.

NFCS-04-0320-055-A105AA



Line 1 and 4 GPS 1,2 — POSITION

[2L] and [5L] TTRK — GPS 1, 2 True Track

[3L] and [6L] MERIT — GPS 1, 2 Figure of Merit (M or FT) (meters or feet)

[2R] and [5R] GS — GPS 1, 2 Ground Speed

[3R] and [6R] MODE — GPS 1, 2 mode : INIT, ACQ, NAV, TEST, FAULT or ALTAID.

- INIT : system initialization
- ACQ : satellite acquisition
- NAV : normal mode
- TEST : system test
- FAULT : invalid system
- ALTAID : degraded mode. GPS uses aircraft imputs for computation purposes.
  and :
  Number of satellites tracked.

R [2] and [5] GPS ALT : GPS altitude is displayed for informational purposes only.
R It is not used by the FMGS. No guarantee can be given regarding its accuracy.

INTENTIONALLY LEFT BLANK

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PERF PAGE

The flight plan is divided into several phases :

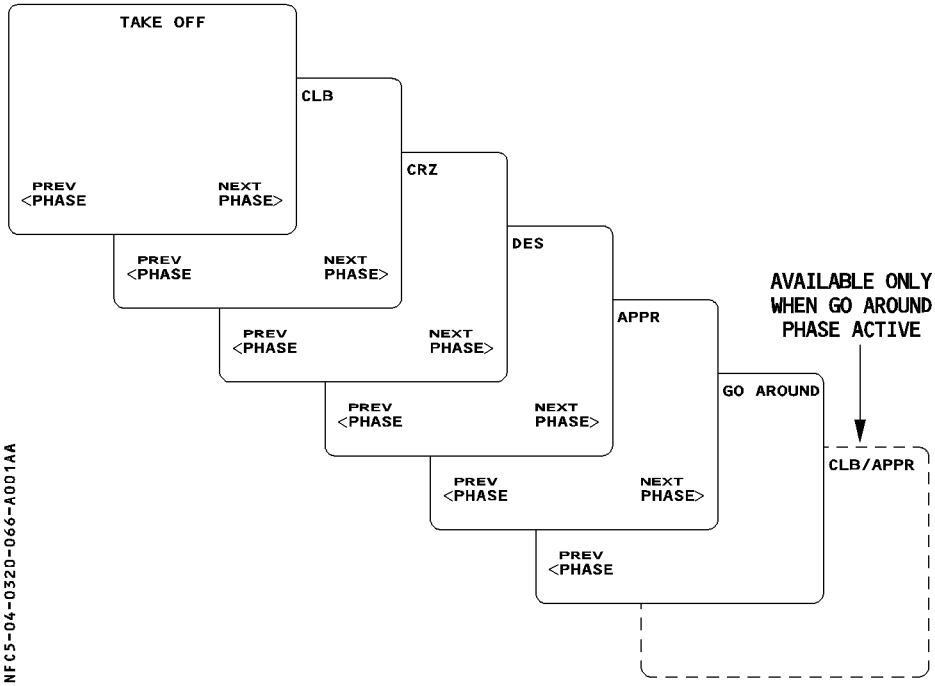
R PREFLIGHT, TAKEOFF, CLIMB, CRUISE, DESCENT, APPROACH, GO-AROUND, DONE.

Each phase except the preflight and done phases has a performance (PERF) page. The PERF pages display performance data, speeds related to the various phases, and predictions.

Pressing the PERF key on the MCDU console calls up the performance page for the current active phase. Performance pages relating to phases already flown are not available.

In the preflight and done phases, pressing the PERF key brings up the takeoff performance page.

Pressing the PERF key in the done phase makes the phase transition to the preflight phase.

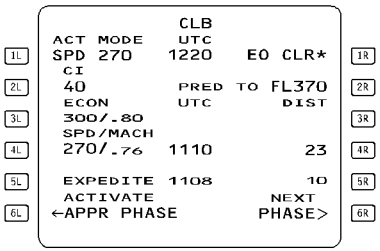


R The FMGS flight phases are not related to the FWC flight phases.

Line 6	Fields may display two different prompts, depending upon whether the phase is active or not.
[6L] PREV PHASE	To review the performance page for the previous phase. The prompt is unavailable on the takeoff performance page. It is also unavailable for phases already flown.
[6L] ACTIVATE APPR PHASE	To activate, then confirm, the APPR phase. Available only on the page corresponding to the active phase.
[6R] NEXT PHASE	To review the performance page for the next phase.

R *Note : "EO CLR" prompt*

- *When the FMGS detects an engine-out condition, the system automatically calls up the performance page for the current flight phase (except when this occurs*
R *before the diversion point during takeoff or no EOSID exists in the flight plan) and displays "EO CLR*" in the [1R] field.*
If the pilot presses the [1R] key , the system reverts to the normal processing (with no engine failed) and suppresses the EO information. (Refer to 4.04.10).
- R *If the engine-out condition is detected before the diversion point at takeoff, a*
R *temporary flight plan is created.*



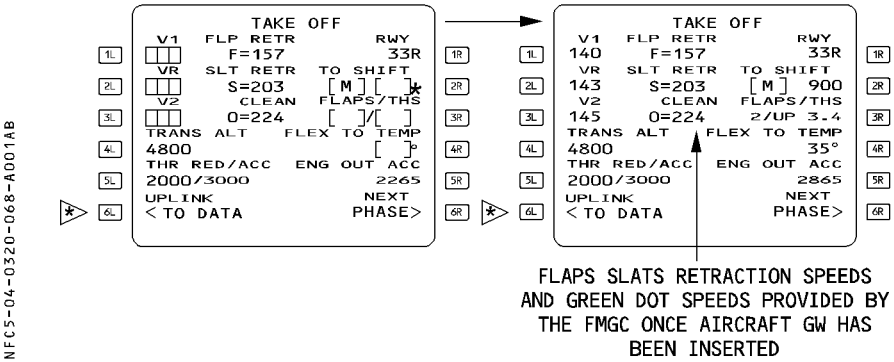
CLIMB PHASE ACTIVE
ENGINE OUT IS DETECTED

NFC5-04-0320-067-A001AA

PERF TAKEOFF PAGE

During the preflight phase, the pilot presses the PERF key to call up the takeoff performance page.

R



TITLE

TAKE OFF white large font when the takeoff phase is not active, green large font when it is.

[1L] V1
[2L] VR
[3L] V2

The boxes are amber as long as the pilot does not make entries in them.
The pilot can modify any entry as long as the takeoff phase is not active.

Note : If the pilot does not enter V2, the SRS mode will not be available at takeoff.

R [4L] TRANS ALT (transion altitude)
[5L] THR RED
R (thrust reduction altitude)

The pilot calls this up from the database after the origin airfield is defined. The pilot can modify it.
This is the altitude at which the pilot should reduce the thrust from TOGA/FLX to MAX CLIMB (CL detent) with all engines operative.

R — "CLB" or "LVR CLB" appears on the FMA flashing amber.

R — The default thrust reduction is 1500 feet above the runway elevation.
— The pilot can modify this altitude : the minimum is 400 feet above the runway elevation.

ACC
(Acceleration altitude)

This is the altitude at which the climb phase is triggered.
- The target speed jumps to the initial climb speed.
- The default value is 1500 feet above runway elevation.
- The flight crew can modify the value. The minimum value is 400 feet above runway elevation, though it is always higher than, or equal to, THR RED.

Note :
- *A clearing action reverts both values to the defaulted ones.*
- *When the crew selects an altitude on the FCU that is :*
  - *below ACC, it brings the ACC down to this altitude.*
  - *below THR RED, it brings THR RED and ACC down to this altitude. (The 400 feet minimum still applies).*

[6L] UPLINK TO DATA ◁

This key calls up the UPLINK TO DATA REQ page.
It is only displayed in the preflight and done phasess, when ACARS is installed.

[1R] RWY

This field shows the takeoff runway selected on the active flight plan. The flight crew cannot make an entry from this field. The field shows dashes, if no runway has been inserted in the flight plan.

R [2R] TO SHIFT

R The takeoff shift is the distance in meters or feet between
R the beginning of the runway and the aircraft's takeoff
R position. When taking off from an intersection, the flight
R crew should insert this value to ensure a correct update of
R the FM position. The takeoff shift value must be positive,
R and cannot be greater than the runway length.

[3R] FLAPS/THS

This is an optional pilot entry for the positions of the flaps and the trimmable horizontal stabilizer (THS) at takeoff.
It is for information only (no action). The flight crew can modify it until takeoff, by entering "UP X.X" or "X.X UP", or "DN X.X" or "X.X DN" for the THS.

[4R] FLX TO TEMP or
DRT TO or FLX TO ◁

The pilot inserts the FLX TO temperature for FLX takeoff setting purposes, or a derated thrust (if installed). It can only be entered during preflight. The system sends it to the FADEC and displays the entered data on the upper ECAM display. The TEMP value is always entered in degrees Celsius.

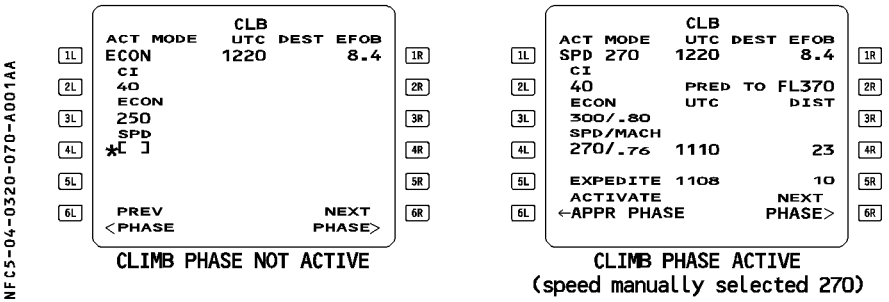
[5R] ENG OUT ACC

This field displays the engine-out acceleration altitude, as defined in the database, or manually entered by the flight crew. This is for display only. It cannot be cleared.
The above ACC altitude rules of [5L] apply to this field.

[6R] NEXT PAGE

This key calls up the climb performance page.

PERF CLIMB PAGE



CLIMB PHASE NOT ACTIVE

CLIMB PHASE ACTIVE
(speed manually selected 270)

R The system calls up this page when an engine out is detected before the top of climb.

TITLE — CLB in a white large font when the climb phase is not active and in a green large font if it is active.

[1L] ACT MODE — This field displays the active target speed (ECON, selected SPEED/MACH, EXPEDITE ◁).
The pilot cannot modify it through this field.

R [2L] CI
R (Cost Index) — This field displays the cost index as initialized on the INIT A page or defaulted from the database.

[3L] ECON — ECON is the optimum speed, considering time and fuel cost ratio for the active flight plan, weather data, cruise flight level, and aircraft gross weight. Speed limits and speed constraints, if any, may prevent the aircraft from flying at the ECON speed.
The system switches from airspeed to Mach number automatically at the SPD/MACH crossover altitude.

[4L] SPD or SPD/MACH or blank

<u>If climb phase is not active :</u>
The pilot can enter a preselected speed.

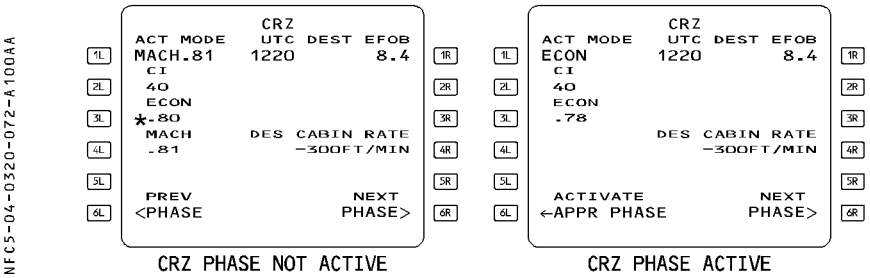
<u>If climb phase is active :</u>
R This field displays the selected or preselected SPD or MACH target.
The pilot cannot modify it directly in this field, but can adjust it with the SPD/MACH selection knob on the FCU.
Pushing in the FCU SPD/MACH selection knob to revert to managed speed, the system selects (or reselects) ECON SPD/MACH and [4L] is blank.

*Note : When the CLB phase is not yet active, a * symbol appears next to the selectable speed.*
It allows the pilot to preselect a specific speed, either ECON, or a manually-entered speed, as the initial CLB speed target.
Example :

ECON ** 250* *SPD* *210*	*The preselected active speed target is 210 knots (no asterisk). Pressing the [3L] key selects the ECON speed.*

R	[5L] Blank or	This field is blank, as long as the aircraft is in preflight.
R	EXPEDITE ◁	This field displays this legend, when the takeoff or CLB phase
R		is active. (The pilot cannot engage EXPEDITE from this field).
	[6L] PREV PHASE	1. This field displays this legend, if the climb phase is not active.
	or	The pilot presses this key to call up the takeoff page.
	[6L] ACTIVATE	2. The field displays this legend, if the climb phase is active.
	APPR PHASE	Pressing this key once displays "CONFIRM APPR PHASE*". Pressing it again activates the approach phase.
	[1R] TIME/UTC,	Before takeoff, this field displays the flight time to destination
	DEST EFOB	and the predicted remaining fuel on board.
		After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board. If the crew enters an estimated takeoff time, the field displays automatically the predicted arrival time (UTC) at destination.
	[2R] PRED TO...	This field displays the target altitude for the predictions shown in 3R, 4R, or 5R. – Defaults to the FCU altitude. – Modifiable to any altitude below CRZ FL.
	[3R]	These fields show predictions for the target altitude selected in
	or	[2R] for the current vertical mode and target speed.
	[4R]	[3R] field : ECON speed predictions
		[4R] field : Manually-selected SPD predictions
	[5R]	[5R] field : EXPEDITE mode ◁ predictions
R		Fields [3R] [4R] [5R] are only displayed, while the takeoff or climb phase is active.
	[6R] NEXT PHASE	The pilot presses this key to call up the cruise page.

PERF CRUISE PAGE



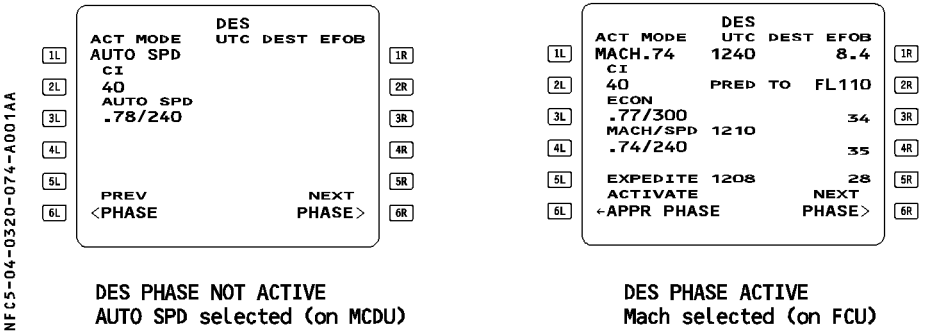
TITLE	CRZ in white, large font, when cruise phase is not active, in green, large font, when it is.
[1L] ACT MODE	This field shows the active speed/Mach target (ECON, MACH or SPD XXX). The pilot cannot modify it through this field.
[2L] CI	This field shows the cost index as initialized on the init A page or defaulted from the data base, or as inserted in this field by the crew.
[3L] ECON	ECON is the optimum speed or Mach, in terms of time and fuel cost ratio, related to the active flight plan, weather, cruise flight level, and gross weight.
[4L] SPD/MACH or Blank	<u>If cruise phase is not active :</u> The pilot can enter a preselected speed or Mach number. <u>If cruise phase is active :</u> This field is blank.

*Note : When the cruise phase is not active, a * symbol appears beside the selectable speed (or Mach).*
This allows the pilot to preselect a specific speed (or Mach), either the ECON value or a value entered manually.
Example :

ECON [3L]	*The preselected active Mach target is .78 (no star)*
** .80*	*Pressing the [3L] key selects the ECON Mach.*
MACH [4L]	
.78	

[6L] PREV PHASE or	The pilot can press this key to call up the climb page, if the cruise phase is not yet active.
[6L] ACTIVATE APPR PHASE	This field displays this legend if the cruise phase is active. The pilot presses the key once to change the legend to "CONFIRM APPR PHASE*". A second press activates the approach phase.
	Note : If the pilot activates the approach phase inadvertently, it can reselect the cruise flight level into the progress page to reactivate the cruise phase.
[1R] TIME/UTC DES EFOB	Before takeoff this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field displays automatically the predicted arrival time (UTC) at destination. After takeoff is displays the predicted arrival time at destination (UTC) and the remaining fuel on board.
[4R] CAB RATE	This field displays the defaulted value of the cabin altitude descent rate used for computing the descent path and if necessary deletes a repressurization segment. The flight crew may modify the value. A clear action reverts to the default value. CAB RATE being a negative value, "minus" is not a necessary entry.
[6R] NEXT PHASE	This key calls up the descent page.

PERF DESCENT PAGE



DES PHASE NOT ACTIVE
AUTO SPD selected (on MCDU)

DES PHASE ACTIVE
Mach selected (on FCU)

TITLE — DES in a white large font when the descent phase is not active and in a green large font, when it is active.

[1L] ACT MODE — This field displays the active speed target (ECON, AUTO SPD, SPD XXX or MACH. XX, EXPEDITE). The flight crew cannot modify it through this field.

[2L] CI — This field displays the cost index, as initialized on the init A page or defaulted from the data base, or inserted in this field by the flight crew. The flight crew cannot modify it when the descent phase is active.

[3L] ECON/AUTO SPD — If the descent phase is not active :
This field displays "ECON" in blue, along with the associated economy descent Mach or speed, also in blue, before the flight crew makes any entry. The crew may overwrite the ECON DES MACH/SPD by entering a Mach number or a speed in this field. The title then reverts to "AUTO SPD".
To compute the top of descent and descent path, the system uses a descent speed profile that is either ECON MACH/SPD or AUTO MACH/SPD, plus SPD CSTR, SPD LIM, GD etc...

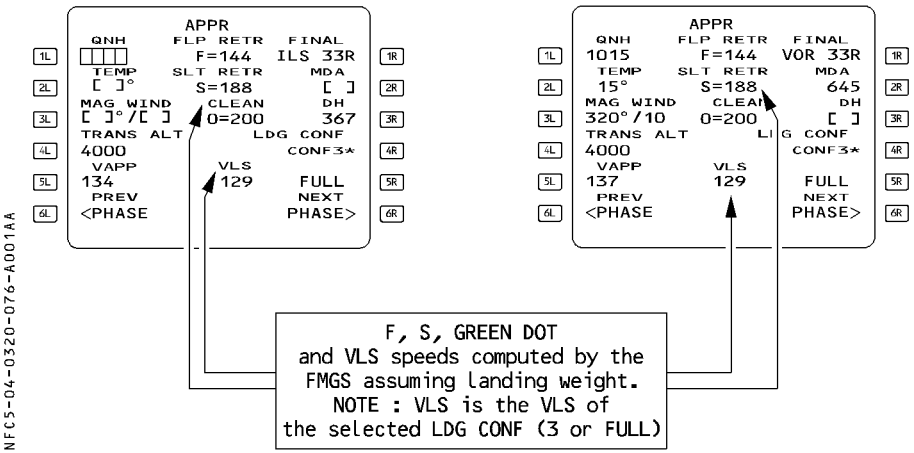
Note : Auto MACH/SPD is a selected value entered by the crew but it will be used as a managed MACH/SPEED to compute and fly the descent profile when the speed target is managed.

If the descent phase is active :
The flight crew cannot make an entry in this field.
The display shows ECON (upper line), .XX/XXX (lower line) or AUTO SPD (upper line), .XX/XXX (lower line).

[4L] MACH/SPD	If the descent phase is not active, this field is blank. If the descent phase is active : This field displays the speed or Mach target when the flight has selected a Mach or a speed manually. The system then displays the speed or Mach target in the speed window of the flight control unit (FCU) and in the [1L] field. The flight crew cannot modify the value in this field. The pilot can adjust it with the SPD/MACH selector knob on the FCU when the speed/Mach has been selected manually. Pushing in the FCU speed selector knob activates the managed SPD/MACH target, which is either ECON or AUTO SPD. [4L] is then blank.
[5L] EXPEDITE ◁ or BLANK	This field displays this legend if the descent phase is active. The flight crew cannot select the expedite mode through this field. The field is blank as long as the descent phase is not active.
[6L] PREV PHASE or ACTIVATE APPR PHASE	This key calls up the cruise phase page if the descent phase is not yet active. This field displays this legend if the descent phase is active. If the flight crew presses the key once, "CONFIRM APPR PHASE*" appears. Pressing it a second time activates the approach phase.
[1R] TIME/UTC DEST EFOB	Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field displays automatically the predicted arrival time (UTC) at destination. After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board.
[2R] PRED TO...	This field displays the target altitude for the predictions in [3R] [4R], or [5R] . The display defaults to the altitude selected on the FCU. The flight crew can modify it to any altitude lower than present altitude.
[3R] or [4R]	These fields display altitude predictions down to the target altitude selected in [2R], computed for the current vertical mode (DES or OP DES, EXPEDITE) and the indicated target speed. The [3R] field shows predictions for the ECON or AUTO SPD/MACH profile. The [4R] field shows predictions for a SPD/MACH selected manually.
[5R]	This field displays predictions for EXPEDITE mode. Fields [3R] [4R] [5R] are displayed only when DES phase is active.
[6R] NEXT PHASE	Pressing this key calls up the approach page.

R

PERF APPR PAGE



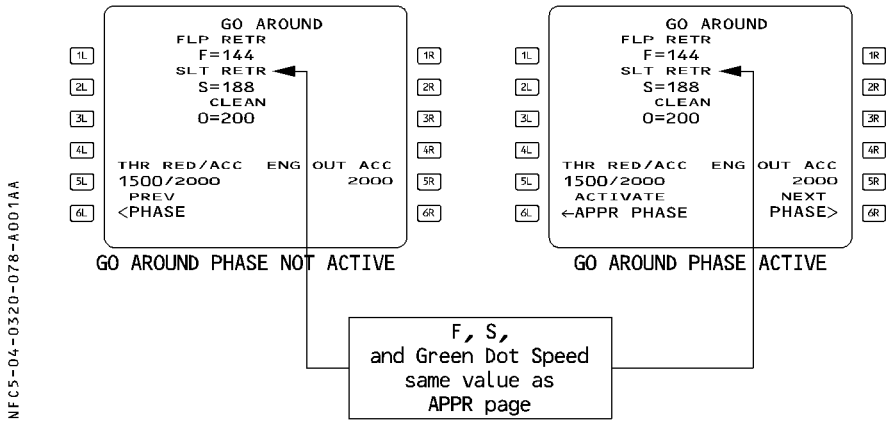
TITLE — APPR is in large white font, if the approach phase is not active ; it is in large green font, if it is.

[1L] QNH — This field displays brackets, when the aircraft is more than 180 NM from the destination. Inside 180 NM, a mandatory amber box appears.
The pilot must either enter the QNH in hPa (three or four digits), or in inches of mercury (two digits, decimal point, and two more digits).
The system interprets :
. 1003 as 1003 hPa ;
. 29.92 as 29.92 inches.
The pilot can modify this entry at any time.
The system uses the QNH to compute the cabin repressurization segment.

[2L] TEMP — This field displays the temperature at destination. The field displays brackets until the pilot enters the temperature. The pilot can modify this figure.
The system uses this temperature to refine its computation of the descent profile (ISA model).

	[3L] MAG WIND	The pilot enters the magnetic wind in knots at the destination in this field. The system transmits any entry made in this field to the vertical revision and flight plan B pages (which display wind direction as true, not magnetic).
	[4L] TRANS ALT	This field displays the transition altitude taken from the data base (small font) or entered by the pilot (large font). The pilot can modify it at any time.
	[5L] VAPP	The FMGC computes this approach speed, using the formula: VAPP = VLS + 5 + 1/3 of the headwind component - (1/3 of the headwind component is limited to 15 kt). The pilot can modify VAPP. A "clear" action reverts VAPP to the computed value. *Note : VLS = 1.23 VS1G of the selected landing configuration (full or 3).*
	[6L] PREV PAGE	This field displays this legend if the approach phase is not active. Pressing this key calls up the descent performance page.
	[1R] FINAL	This field displays the approach specified in the flight plan. The pilot cannot modify it through this field.
R	[2R] MDA or MDH	This field displays the minimum descent altitude (or minimum descent height if the QFE pin program is activated), with associated brackets. The pilot inserts the value, which it can modify at any time. If the flight crew makes an entry in [3R] or changes the approach, it clears this figure.
	[3R] DH	If the flight plan includes an ILS approach, this field displays "DH" and empty brackets. The pilot inserts the decision height. The system will accept an entry of "NO". If the flight crew inserts an MDA or an MDH, this erases the decision height, and this field reverts to brackets. The DH range is 0 to 700 feet.
R	[4R] LDG CONF CONF 3	The pilot can select configuration 3 by pressing the 4R key. This moves the * down to the [5R] field, which is displaying "FULL".
R	[5R] FULL	The pilot can use this key to select configuration FULL when necessary. Configuration FULL is the default landing configuration.
	[6R] NEXT PHASE	Depressing this key calls up the go-around performance page.

PERF GO AROUND PAGE



TITLE

GO AROUND in a white large font if the go-around phase is not active, in a green large font if it is.

[5L] THR RED ACC

This field displays the thrust reduction altitude and the acceleration altitude.

Thrust reduction altitude

- Altitude at which thrust must be reduced from takeoff/go-around thrust to maximum climb thrust
- "CLB" or "LVR CLB" flashing on flight mode annunciator.
- Defaults to 1500 feet above destination runway elevation.
- Can be modified by the crew (minimum 400 feet above destination runway elevation).

Acceleration altitude

- Altitude at which target speed jumps to green-dot speed (see the note below).
- Defaults to 1500 feet above destination runway elevation
- Can be modified by the crew but always equal to or higher than thrust reduction altitude.

[6L] PREV PHASE or	This field displays this legend if the go-around phase is not active. Pressing the key calls up the PERF APPR page.
ACTIVATE APPR PHASE	This field displays this legend if the go-around phase is active. Pressing it once makes "CONFIRM APPR" appear. A second press activates the approach phase.
[5R] ENG OUT ACC	This display has the same characteristics as the display beside the 5R key on the takeoff page. It is for display only, and the pilot can modify it.
[6R] NEXT PHASE	Pressing this key calls up the PERF APPR page.

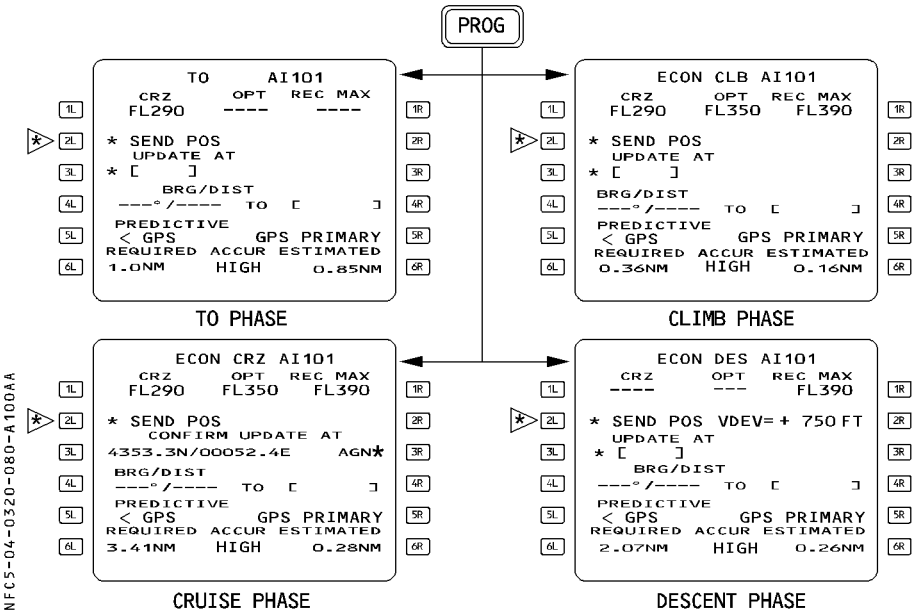
Note : When the go-around phase is active, if the pilot enables ALTN or if the pilot inserts a new destination in the active flight plan and a new cruise flight level on the progress page, the go-around phase shifts automatically into the climb phase. (The target speed jumps from green dot speed to initial climb speed).

PROG PAGES

The progress page is a multifunction page that allows the pilot to :

- Select a new cruise flight level.
- Crosscheck the Flight Management (FM) system's navigation accuracy, and validate it.
- Update the FM position.
- Monitor the descent.

R



TITLE — Different for each flight phase (see above diagrams). The vertical phase is in large green font. The flight number is in large white font. The EO is in large amber font, if the engine-out condition is detected.

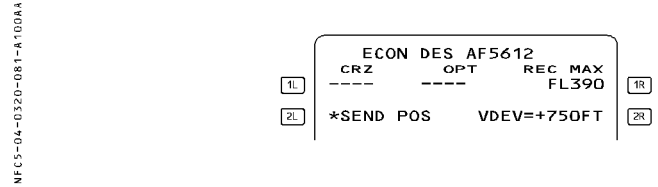
Line 1 CRZ (blue) — This line shows the cruise flight level inserted on the INIT A page, or directly in this field, in blue. If the flight crew uses the FCU to select an altitude that is higher than that displayed in this field, the system changes the displayed number to match the value selected via the FCU.
The flight crew cannot insert a flight level that is lower than the FCU-selected altitude.
This field displays dashes, when the descent or approach phase is active.

OPT — This field displays the optimum flight level (in green), that is computed based on the current gross weight, cost index and temperature.
It displays dashes :
- In cruise, when the aircraft is less than 15 NM from the Top of Descent
- If an engine-out is detected.

REC MAX — This field displays the recommended maximum altitude (in magenta), that is computed based on the current gross weight and temperature. It provides the aircraft with a 0.3 g buffet margin, a minimum rate of climb at MAX CL thrust, and level flight at MAX CRZ thrust. This field is limited to FL 391.
If one engine is out, this field displays the recommended maximum engine-out altitude, that is computed based on the long-range cruise speed and assuming that anti-ice is off.

[2L] SEND POS (blue) — The flight crew may send a position report by pressing the key adjacent to this field. The report will include ETA at the "TO" waypoint and the NEXT waypoint.

R [2R] VDEV — This field is displayed during the descent and approach phases, when NAV mode is engaged, or in HDG mode, provided that the crosstrack error (XTK) is less than 5 NM. It displays the vertical deviation between the aircraft's current altitude and the FMS-computed vertical profile.

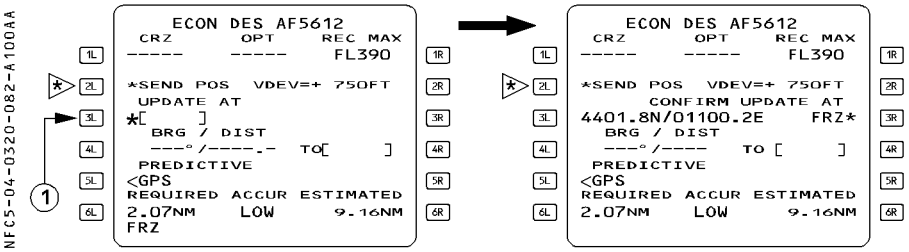


NFCS-04-0320-081-A100AA

Line 3 UPDATE AT — The flight crew can update the FMS position via this field by entering either the ident of a waypoint, a NAVAID, an airport, a latitude and longitude (L/L), a place/bearing/distance (PBD), or a place-bearing/place-bearing (PB/PB).
When the flight crew has entered this data, this field changes its format to : "CONFIRM UPDATE AT", followed by the latitude/longitude and ident of the inserted position with an asterisk.
The flight crew presses the right-hand key adjacent to the asterisk to confirm the update, when the aircraft overflies the inserted position.

Note : If no ident has been inserted, the field displays "ENTRY", instead of an ident.

R



Line 4 BRG/DIST

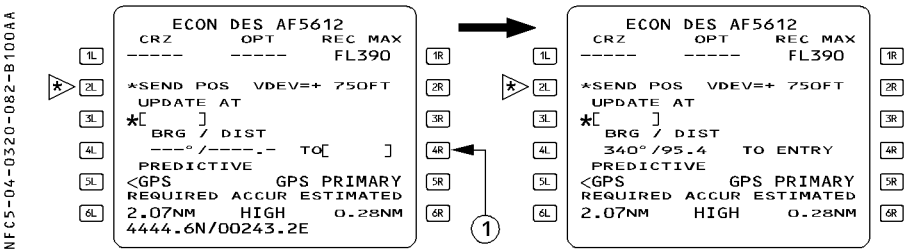
The pilot can enter an airport, a waypoint, a navaid, or a runway on this line. The pilot may enter each as an ident, a latitude/longitude (L/L), a place/bearing/distance (PBD), or a place-bearing/place-bearing (PBX). The field then shows the FMGC-computed bearing and the distance of this site from the aircraft's present position. The last distance digit is in 1/10 of a NM. If it does not have an ident, the point is called "ENTRY".

Example :

BRG/DIST

340°/95.4 to ENTRY

R

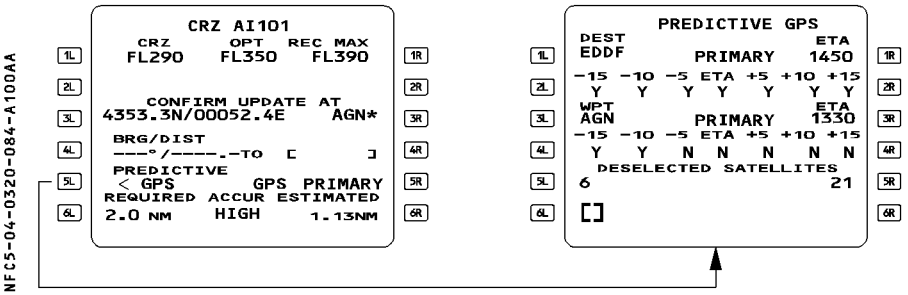


[5L] PREDICTIVE GPS	This prompt gives access to the PREDICTIVE GPS page.
[5R] GPS PRIMARY	This prompt is displayed, when the FMS navigation mode is GPS PRIMARY. When GPS PRIMARY is not available, or the navigation mode is not GPS/IRS, this field is blank. The scratchpad displays the relevant "GPS PRIMARY" message, when this prompt appears ; and, "GPS PRIMARY LOST", when the field turns to blank.
[6L] REQUIRED	This field displays the default value for the required navigation accuracy level, and it can be modified by the flight crew. Provided no pilot entry has been made, the default value changes according to the actual flight area (En route, terminal, approach, refer to 1.22.20).
R ACCUR HIGH/LOW	This field shows the Flight Management (FM) system's estimate of navigational accuracy. "HIGH" indicates that the FMS estimates that the navigational accuracy matches the accuracy criteria of the area currently flown. "LOW" indicates that the criteria is not matched.
[6R] ESTIMATED	This field displays the current estimated navigation accuracy value (EPE), as computed by the FMS.

PREDICTIVE GPS PAGE

R *Note : This page is only operative with Honeywell GPS. With GPS Litton, all fields are*
R *dashed.*

The pilot accesses this page by pressing the PREDICTIVE GPS prompt of the PROG page. This page displays information relative to predictive availability of GPS PRIMARY at destination, and at any waypoint selected by the crew.



[1L] DEST — Destination airport, as currently selected in the active flight plan. It is not modifiable. This field displays dashes when no destination airport exists.

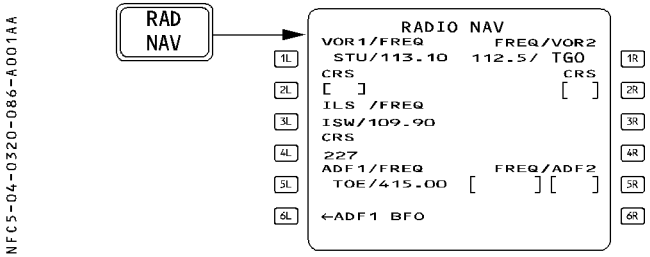
[1R] ETA — This field is defaulted to the Estimated Arrival Time, as computed by the FMS (small blue font). The pilot may enter a value in this field (large blue font). Amber boxes are displayed, when no prediction exists, or the crew entry has been cleared.

Line 2 PRIMARY Y/N — Predicted primary status at destination airport, at the following times :
Estimated Time of Arrival ± 5, 10, 15 minutes.
Availability of GPS PRIMARY at the corresponding time is indicated by Y, when PRIMARY is predicted to be available ; and, by N, when GPS PRIMARY is predicted not to be available.
These fields are blanked when the destination [1L] field, or the time [1R] field is not defined.

[3L] WPT	The pilot may enter a reference waypoint in this field. Blue brackets are displayed when no entry has been made.
[3R] ETA	When a reference waypoint has been entered in [3L], amber boxes are displayed. The crew is requested to enter a reference time in this field.
Line 4 PRIMARY Y/N	Equivalent information to [2L] / [2R] displayed for any pilot selected waypoint. Corresponding time of arrival is also displayed.
Line 5 DESELECTED SATELLITES and Line 6 SATELLITES	Allow the pilot to deselect up to four satellites by inserting the corresponding satellite number, the number is then displayed in blue large font. When deactivated, the satellites are not considered for predictive GPS availability at destination or at selected waypoint. The deselection is cancelled when the entry is cleared (blue brackets are displayed) or the field is overwritten by a different satellite number.

RADIO NAV PAGE

This page allows the pilot to select or verify the radio navaids tuned for display purposes only.
Among these navaids are VOR, VOR/DME, TAC, VORTAC, ILS, and ADF.
If either RMP is set on NAV, this page is blanked on both MCDUs.



NFC5-04-0320-086-A001AA

Line 1 VOR1/FREQ FREQ/VOR2	This line displays the identifiers and frequencies of VOR1 and VOR2, whether they are autotuned or tuned manually. To tune one VOR manually, the pilot inserts the ident or frequency. If the ident is not in the database, the new navaid page comes up. A “clear” action reverts the selection to the autotuned navaid.
Line 2 CRS	This line displays courses for the navaids in Line 1. The pilot can enter the courses manually through these fields.
[3L] ILS/FREQ	This field displays the ident and frequency of an ILS. It is autotuned if this ILS is associated with the departure runway, or if the flight plan shows an ILS approach selected for the destination. The ILS may also be entered manually. When the manually entered ILS differs from the ILS that would be autotuned, “RWY-ILS MISMATCH” appears.
[4L] CRS	This field displays the course associated with the ILS in line 3. It comes up automatically when an ILS is autotuned or if an ILS has been manually tuned via its ident. Otherwise the course must be entered manually.

Line 5 ADF1/FREQ FREQ/ADF2	This line displays the identifiers and frequencies of ADFs 1 and 2. The pilot can use the ident or the frequency to tune the ADF manually. If he uses the frequency, he must always include a decimal point (as 370.).
Line 6 ADF1/BFO BFO/ADF2	When an ADF is selected, these fields display an ADF/BFO prompt. The flight crew presses the key once to erase the arrow and put the ADF in BFO mode. A clear action brings the arrow back and cancels BFO.

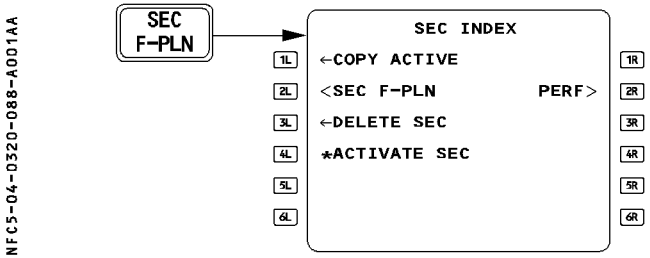
Note : – *The autotune function works only for navaids stored in the data base.*
– *When tuning manually, the operator should use the ident rather than the frequency unless the navaid is not in the data base.*
– *Manually tuned frequencies are displayed in a large font.*
– *Second ADF is optional.*

SECONDARY PAGES

The SEC F-PLN key on the MCDU console allows the pilot to call up the secondary index page and the secondary flight plan page. The secondary flight plan is generally for a diversion, for predictable runway changes for takeoff or landing, or for training.
There are two types of secondary index pages. The type selected depends on the presence of a secondary flight plan.

SECONDARY INDEX PAGE

A SECONDARY FLIGHT PLAN IS ALREADY DEFINED



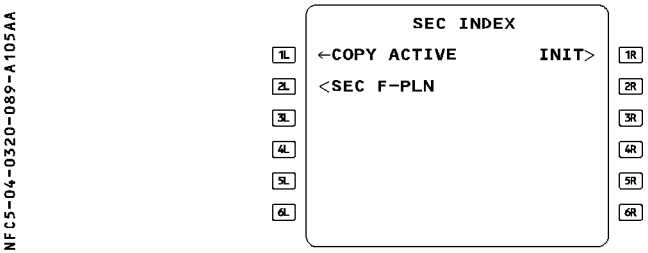
NFC5-04-0320-088-A001AA

[1L] COPY ACTIVE (blue)	The pilot presses this key to copy the active flight plan into the secondary flight plan and erase the previous secondary plan.
[2L] SEC F-PLN (white)	The pilot presses this key to call up the secondary flight plan pages.
[3L] DELETE SEC (blue)	The pilot presses this key to delete the current secondary flight plan.
[4L] ACTIVATE SEC (amber)	The pilot presses this key to activate the secondary flight plan as the active flight plan.

Note : "ACTIVATE SEC" appears routinely if the HDG/TRK mode is active. If the NAV mode is active, "ACTIVATE SEC" appears only if the active and secondary flight plans have a common active leg.

[1R] INIT	This field displays this prompt when the secondary flight plan is not defined as a copy of the active flight plan. Pressing this key calls up the secondary INIT page.
[2R] PERF (white)	The pilot presses this key to call up the performance pages for the secondary flight plan. When the active flight plan has been copied, the field displays this prompt only if the first lateral leg of the secondary flight plan is identical to the active leg of the primary flight plan.

A SECONDARY FLIGHT PLAN IS NOT DEFINED



[1L] COPY ACTIVE (blue)	The pilot presses this key to copy the primary active flight plan into the secondary flight plan.
[2L] SEC F-PLN (white)	The pilot presses this key to call up the secondary flight plan pages.
[1R] INIT (white)	The pilot presses this key to call up the secondary INIT page. It is similar to the active INIT page, but blue brackets replace all the amber boxes.

SECONDARY FLIGHT PLAN PAGES

The secondary flight plan A and B pages are identical to those for the active flight plan, but are sequenced automatically only when the secondary is copied from the primary and their active legs are identical.
Pages for the active and secondary flight plans differ from each other as follows :

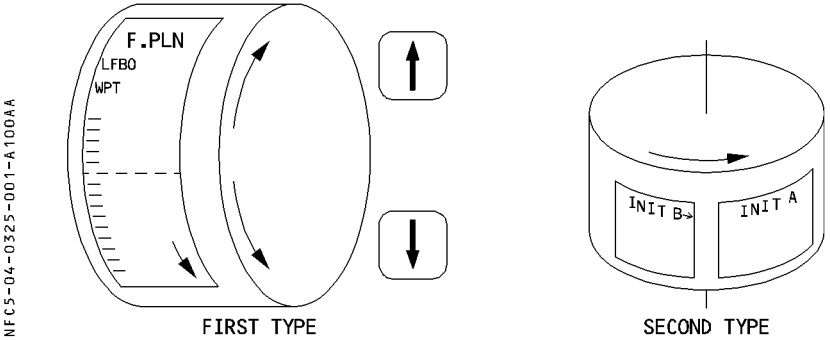
Secondary lateral revision pages :
- ERASE and INSERT are not displayed.
- OFFSET is not available.

Secondary init A and B pages :
- They use blue brackets instead of amber boxes.
- They have no align prompt.
- They do not provide for slewing or entering data in the 4L-4R fields (airport reference).
- They have no history wind page.
- They have no temporary flight plan pages.
  Predictions become available as soon as the FMGS receives data relevant to the secondary flight plan.

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GENERAL

The Flight Management and Guidance System (FMGS) displays information on various "pages". When a page cannot display all of the assigned information, it cues the pilot to call up additional information. There are three types of pages, and each type has its particular way of cuing the pilot to call up additional information.



NFCS-04-0325-001-A100AA

First type

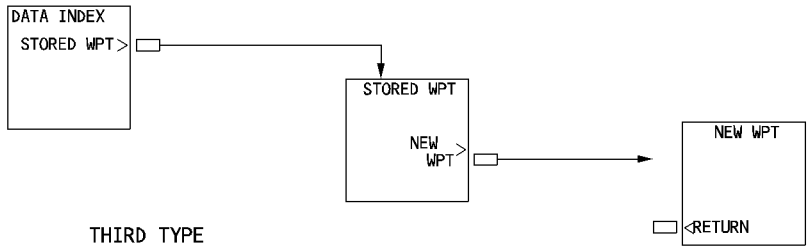
When this page cannot simultaneously display all the information on the screen (more information than the six pairs of lines can hold), the pilot can scroll the page up or down. In this case, the screen displays a ↑↓ symbol in the bottom righthand corner (F-PLN pages, secondary F-PLN page, departure/arrival pages,...).

Second type

When the information is on successive pages, the pilot presses the "NEXT PAGE" key to sequentially call up these pages.
In this case, an arrow is displayed in the top righthand corner of the screen (INIT pages).

Third type

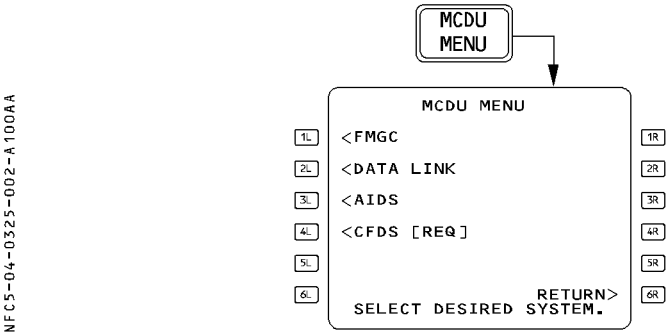
When different types of information are on successive pages, the pilot calls up these pages by pressing the key adjacent to the prompts >, < or *.



NFCS-04-0325-001-B100AA

MCDU MENU PAGE

This page lists the various systems which the pilot can access via the MCDU.



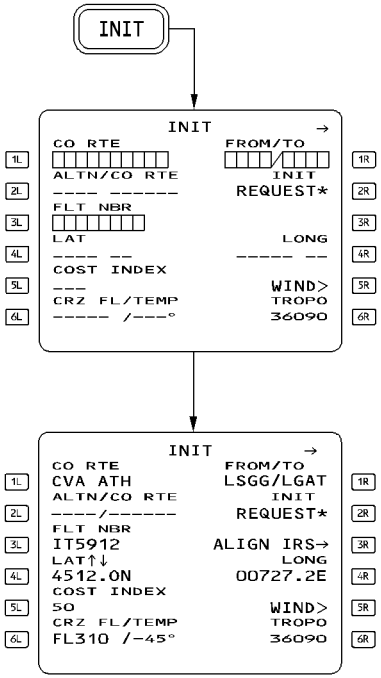
NFC5-04-0325-002-A100AA

The pilot selects a system by pressing the key adjacent to the name of that system. The name of the selected system is displayed in green, all others in white.
If the MCDU cannot establish communication with the selected system, it displays “TIME OUT”.
When a system calls for the pilot’s attention, the MCDU displays “REQ” next to the system’s name, and the “MCDU MENU” annunciator lights up.
When the pilot presses the key next to the name of the system requiring attention, the “MCDU MENU” annunciator light goes out.

INIT A PAGE

The flight crew uses the INIT A page to initialize the flight plan and align the inertial reference system.

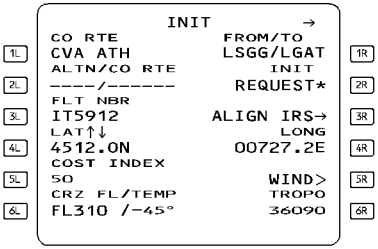
- The flight crew accesses to this page by pressing the INIT key on the MCDU console, but only during the preflight phase.
- The flight crew may also call up this page by :
  - Pressing the "NEXT PAGE" key on the MCDU console, while on the INIT B page, or
  - Pressing the key next to "RETURN" or "INSERT" on the route selection page, or
  - Pressing the key next to "INSERT" on the wind page.
- When in the done phase, the pilot may press the INIT key to begin the next preflight phase.



NFC5-04-0325-003-A100AA

[1L] CO RTE	If the flight crew enters a company route number, the screen displays all data associated with that route (8 or 10 characters, depending on the pin program). Inserting the CO RTE into the RTE selection page also enters the CO RTE number in this field.
[2L] ALTN/CO RTE (blue)	This field is dashed, until a primary destination is entered in the 1R field. If a preferred alternate is associated with the primary destination, it is displayed in this field with the company route identification. The crew may manually enter an alternate and company route. If preferred alternate is not associated with the primary destination, NONE is displayed in this field. When the alternate route and the primary destination do not match, the MCDU scratchpad displays "DEST/ALTN MISMATCH". If the primary destination is changed, this field is modified accordingly.
[3L] FLIGHT NUMBER	The flight number automatically appears in this field, if it is stored with the company route. The flight crew may modify it, or enter a new number here.
[4L] LAT	The latitude of the departure airport reference point appears here. The flight crew may modify it by slewing or overwriting.
[5L] COST INDEX	This is usually stored in the database along with the company route. The flight crew may modify it, or enter a new value here. It defaults to the last entered value, if a value is not stored in the database.
[6L] CRZ FL/TEMP (cruise flight level and temperature)	The cruise flight level is usually stored in the database along with the company route. If not, it has to be entered manually. If no cruise flight level is entered, the system will not furnish predictions, while the aircraft is on the ground. The flight crew has to enter the temperature at cruise flight level in order to refine the predictions. Otherwise, these are computed for ISA conditions. (If no sign is entered, the system uses a plus).

NFCS-04-0325-005-A100AA



[1R] FROM/TO

This field allows the pilot to enter a city pair (ICAO codes for city of origin and destination). This entry automatically deletes any previously entered company route and calls up the route selection page. If one airfield of the pair is not in the database, the display changes to the NEW RWY page.

[2R] INIT REQUEST

This prompt is displayed if the pilot did not enter an active flight plan or entered a flight number or a company route that is not in the aircraft database. Selecting this prompt sends the ground a request for active flight plan initialization (downlink message). When the star is not displayed, a downlink message cannot be sent.

The uplink flight plan is automatically inserted in the active flight plan, prior to engine start, provided an active flight plan does not exist.

After engine start, the uplink flight plan is sent to the secondary flight plan and manually inserted or rejected . (Refer to 4.04.40).

[3R] ALIGN IRS

This field displays this legend only if the LAT and LONG fields are filled in, and at least one of the inertial reference systems is in ALIGN status (IRS in NAV position and alignment process not over). If the pilot presses this key when its field is displaying this legend, the present coordinates are sent to the IRSs and this completes the alignment process.

If one of the three IRSs indicates an ALIGN FAULT occurrence, the prompt becomes REALIGN IRS.

[4R] LONG

This field displays the longitude of the departure airport reference point. The pilot may modify by slewing or overwriting.

[5R] WIND >

The pilot presses this key in order to gain access to the climb wind page, unless a temporary flight plan exists. In this case, the scratchpad displays TEMPORARY F-PLN EXISTS.

[6R] TROPO

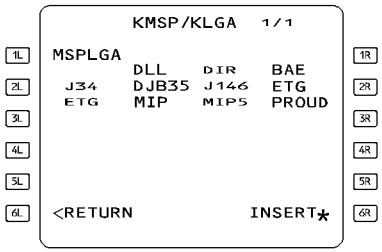
The default tropopause altitude is 36090 feet. The pilot can use this field to modify it (60000 feet maximum).

ROUTE SELECTION PAGE

This page displays all the company routes, stored in the database, that are associated with the inserted city pair. They can be called up manually, or displayed automatically.

- Manually : The pilot presses the FROM/TO or ALTN key on the INIT A page when a city pair is displayed.
- Automatically : The system displays it, when the pilot enters a city pair, or defines an alternate on the INIT A page of the active or secondary flight plan.

NFCS-04-0325-006-A100AA



TITLE	Idents for the city pair inserted on the INIT A page. (The numbers in the upper righthand corner are the total number of company routes from this city pair stored in the database).
[1L]	This field shows the name of the company route. NONE appears, if there is no company route for this city pair.
Line 2 to Line 5	These fields display the various elements of the company route : Waypoints in large green font, and airways in small white font.
[6L] RETURN	The pilot presses this key to return to the INIT A page.
[6R] INSERT	The pilot presses this key to insert the displayed company route in the flight plan, and return to the INIT A page.

Note : The pilot can slew the display to show the rest of the route, if one page does not show it all, or to display other company routes for this city pair.

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WIND PAGES

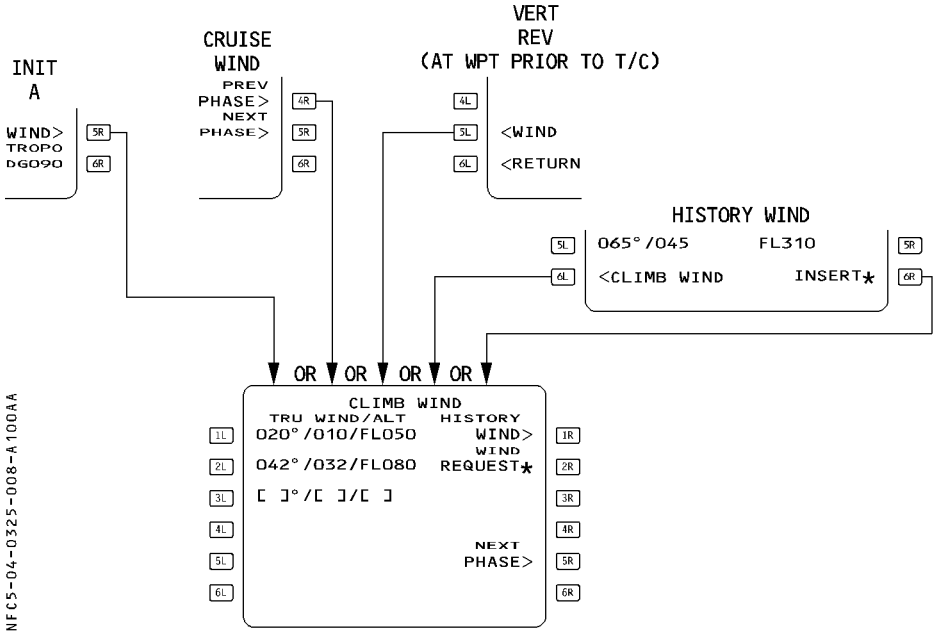
Winds in climb, cruise, descent and approach are necessary to provide the pilot with reliable predictions and performance. Wind pages enable the pilot to enter and/or review the winds propagated by the FMGS or sent by ACARS for the various flight phases.

Note : On WIND pages, wind direction is always true-referenced.

CLIMB WIND PAGE

This page enables the pilot to enter and/or review predicted wind vectors (direction and velocity) at up to 5 different levels.

The CLIMB WIND page is accessed from :



TITLE — CLIMB WIND in large white font.

[1L] TRU WIND/ALT to [5L] — This field displays the winds, entered at various climb altitudes : In blue before climb phase activation, and in green after climb phase activation.
This field may also display history winds or uplink winds.
Large blue brackets are displayed before any wind entry.
Pilot-entered and uplinked winds are displayed in large font.
History wind data is displayed in small font.
Upon sequencing the top of climb, the climb winds are deleted.

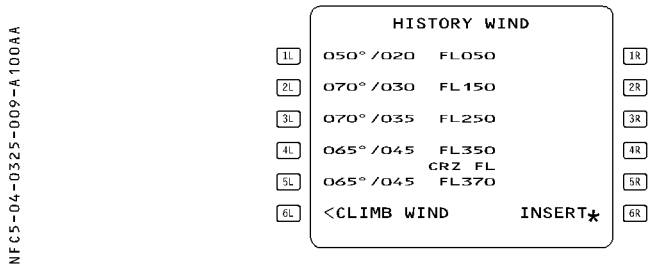
Note : Climb winds are not deleted, when the origin airport is changed.

[1R] HISTORY WIND — Displayed in preflight phase only. This key calls up the history wind page. This page is not modifiable (small green font), but can be inserted into the CLIMB WIND page by using the 6R key and modified accordingly.

[2R] WIND REQUEST — Pressing this key sends a request for ACARS winds. (Refer to 4.04.40).

[5R] NEXT PHASE — Pressing this key calls up the CRUISE WIND page, or the DESCENT WIND page, if no cruise waypoint exists.

HISTORY WIND PAGE



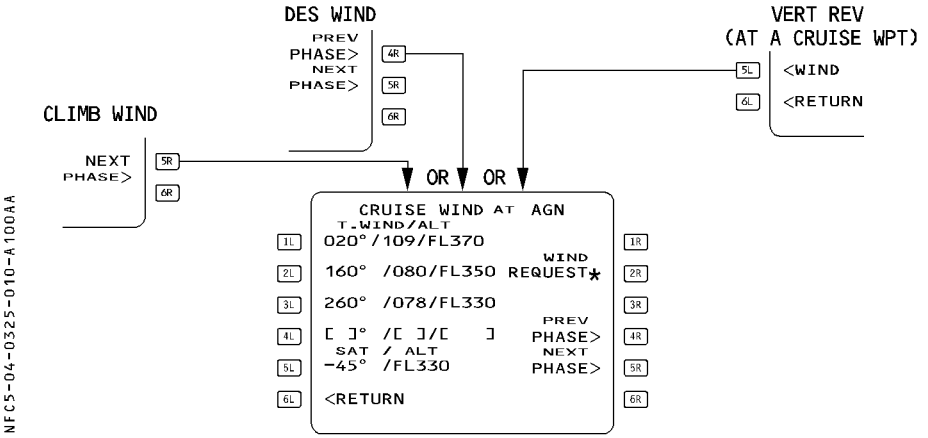
NFC5-04-0325-009-A100AA

[6L] CLIMB WIND — This key reverts the display to the CLIMB WIND page.

[6R] INSERT — This key inserts the history wind values into the CLIMB WIND page.

CRUISE WIND PAGE

This page displays the wind direction and velocity for each cruise waypoint.
The cruise wind page enables the definition of a temperature at a given altitude, and is accessed as follows :

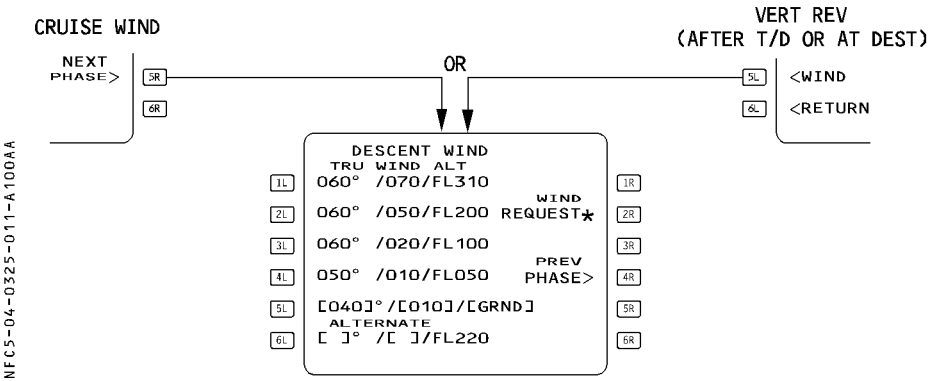


TITLE	CRUISE WIND AT in large white font.
[1L] TRU WIND/ALT to [4L]	These fields display the entered wind at various altitudes in blue. The entered winds are propagated at the same altitude to the downpath cruise waypoints, if no other winds are entered. The propagated wind direction and velocity are displayed in small fonts. Both uplinked winds and pilot-entered winds are displayed in large blue font. Wind data is modifiable during cruise.
[5L] SAT/ALT	This field allows the pilot to enter a temperature at a given flight level, or to display a propagated value. The crew must enter both temperature and altitude at the first entry. They can then independently modify the temperature, or the altitude.
[2R] WIND REQUEST	Pressing this key sends a request for ACARS winds. (Refer to 4.04.40)
[4R] PREV PHASE	This prompt is displayed in Preflight, Takeoff, Climb and Done phases. Pressing this prompt calls up the CLIMB WIND page.
[5R] NEXT PHASE	Pressing this prompt calls up the DES WIND page.

Any new entry performed on the CRUISE WIND page is immediately inserted into the corresponding flight plan. Predictions are dashed on the F-PLN pages during the recomputation time. CRUISE WIND page automatically reverts to F-PLN page, if a temporary flight plan is created or the secondary flight plan is activated.

DESCENT WIND PAGE

This page enables the pilot to define and display the winds used for computing the descent profile.
The pilot calls it up by selecting NEXT PHASE on the CRUISE WIND page, or the WIND prompt on the VERT REV page.



[1L] to [5L]	This displays inserted winds or uplinked winds, in large blue fonts, prior to activating the descent phase (modifiable values), and in green after descent phase activation (not modifiable values). An entry of "GRND" in the "ALT" field is seen as the wind at ground level. This wind is copied on the PERF APPR page (and corrected for the magnetic variation). A clear action on one key reverts the line to blue brackets.
[6L] ALTERNATE	This field is only displayed when an alternate is defined. The pilot-entered value or uplinked value is displayed in large blue font. It is always modifiable by the pilot.
[2R] WIND REQUEST*	Pressing this key sends a request for ACARS winds. (Refer to 4.04.40).
[4R] PREV PHASE	Pressing this key calls up the CRUISE WIND page. The field is erased after the top of descent has sequenced.

Note : Descent winds and alternate wind are deleted, if the destination airport is changed.

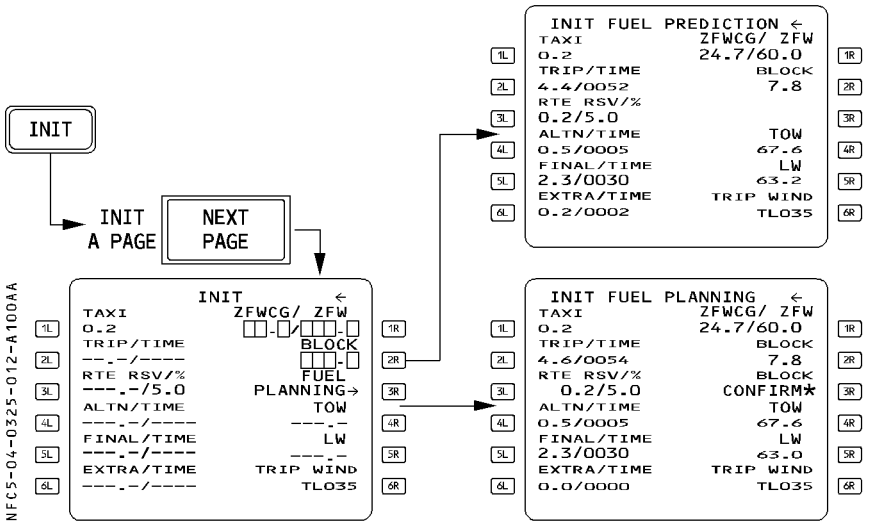
INIT B PAGE

The pilot uses this page to initialize the gross weight and center of gravity, before starting the engines.

The pilot can call it up from the INIT A page by pressing the NEXT PAGE key on the MCDU console, as long as engines have not been started.

This page automatically reverts to the FUEL PRED page after the first engine is started.

R



[1L] TAXI — This is the taxi fuel, which defaults to a preset value, (usually 200 kilos). The pilot can change the value through this field.

[2L] TRIP/TIME (green) — This field displays trip fuel and time when predictions become available.
The pilot cannot modify this data.

[3L] RTE RSV/% (blue) — This field displays the reserve fuel for the route and the corresponding percentage of trip fuel. It may be blank, if such is the policy of the operator. The pilot can either enter a route reserve, or a percentage, and the system then automatically computes the nominal value.

[4L] ALTN/TIME (green)
This field displays alternate trip fuel and time, assuming that the Cost Index = 0 and that the aircraft flies at the default cruise flight level. This field displays its information in small font, and it cannot be modified by the flight crew.

[5L] FINAL/TIME (blue)
This field displays hold fuel and time, associated with continued flight to the alternate airport (or destination airport if no alternate is defined). The pilot may enter a final fuel or time (at alternate or destination) and the system will compute associated holding fuel/time available. Assumptions include a racetrack pattern 1500 feet above the alternate airport, with the aircraft in CONF 1 at maximum endurance speed (or in accordance with the airline fuel policy established in the database).

[6L] EXTRA/TIME (green)
This field displays the amount of extra fuel and the available time it represents for holding over the alternate or primary destination, if the pilot did not define an alternate.
EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + ALTN + FINAL)
The field displays this information in small font, and it cannot be modified by the flight crew.

[1R] ZFWCG/ZFW
The zero fuel weight and the location of the zero fuel weight CG are mandatory entries that allow the system to compute speed management and predictions. The pilot can modify this data.

[2R] BLOCK
The block fuel in this field is a mandatory entry that allows the system to predict the estimated fuel on board (EFOB). When the pilot enters a block fuel, the page title changes to INIT FUEL PREDICTION.
The FMGC may also compute the block, if the pilot selects the FUEL PLANNING function.

[3R] FUEL PLANNING (amber)
Pressing this key initiates an FMGC block fuel computation. When the pilot selects this function, FUEL PLANNING becomes green, and the BLOCK field is dashed during FMGC computation. The title of the page changes to INIT FUEL PLANNING, and BLOCK CONFIRM* replaces the FUEL PLANNING prompt, when the block fuel is computed by the FMGC. If the pilot modifies the parameters used for the prediction computation before confirmation, the computation automatically restarts and FUEL PLANNING is displayed in green.

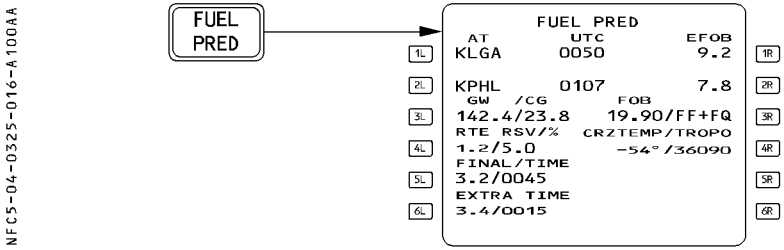
Note : If the pilot enters a number in the 1R or 2R field that exceeds the limits, the field displays "ENTRY OUT OF RANGE" and does not accept the value.

[4R] TOW (green)	This field displays the computed takeoff weight. The pilot cannot modify it (small font).
[5R] LW (green)	This field displays the computed landing weight at the primary destination. The pilot cannot modify it (small font).
[6R] TRIP WIND	This field allows the entry of a mean wind component for the trip from the primary origin to the primary destination. Upon entry of a CO RTE or FROM/TO pair, this field defaults to HD 000 in small blue font. An entry preceeded by –, H, HD is considered as headwind, +, T, TL as tailwind. The entered velocity is displayed in large blue font. As soon as the crew inserts a wind on the CLIMB, CRUISE or DESCENT WIND page, the system no longer considers the trip wind.

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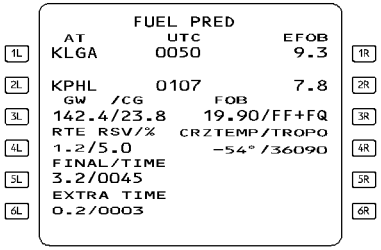
FUEL PREDICTION PAGE

The pilot presses the FUEL PRED key on the MCDU console to display fuel prediction information at destination and alternate, as well as fuel management data after the engines are started.



	Line 1 AT-UTC/TIME-EFOB	These fields display time and fuel predictions to the primary destination. TIME is displayed before takeoff. UTC predictions are displayed after takeoff. After the pilot enters an Estimated Takeoff Time (ETT), the UTC is displayed.
	Line 2 AT-UTC/TIME-EFOB	These fields display time and fuel predictions to the alternate airport. (Refer to 4.04.15).
	[3L] GW/CG	GW The system continually updates gross weight during the flight. If no zero fuel weight has been entered, the screen displays amber boxes next to this key. The pilot must enter information in these boxes in order to obtain a speed profile, speed computations, and predictions. The field displays dashes, as long as the system is not calculating fuel on board. CG The system continually updates the center of gravity location along the flight path. If no center of gravity has been entered, the screen displays amber boxes next to this key. The pilot must enter information in these boxes in order to obtain a speed profile, speed computations and predictions. The pilot can modify both the GW and the CG.
R R R R	[4L] RTE RSV/%	Prior to departure, this field displays the route reserve fuel and the corresponding percentage of trip fuel. After takeoff, it displays the percentage of the remaining trip fuel from the present position to the destination. The field may be blank, depending on the fuel policy of the operating airline. The crew can enter either a RTE RSV or a RTE RSV %. The system automatically computes the other value.

NFCS-04-0325-017-A100AA



[5L] FINAL/TIME — This field displays the amount of fuel available for holding, and the amount of hold time that will be available over the alternate airport (or primary destination, if no alternate is defined). The pilot may enter either a final fuel, or a time, although the system automatically computes a nominal value. The system assumes that the holding will be in a racetrack pattern, 1500 feet above the alternate airport, with the aircraft in clean configuration at green dot speed (or will obey the "airline fuel policy" of the database).

[6L] EXTRA/TIME — This field displays the amount of extra fuel, and the resulting time available for holding over the primary destination.
EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + ALTN + FINAL).
The pilot cannot modify this field (displayed in small green font).

[3R] FOB — This field displays the fuel on board, which is computed :
- With information from the fuel flow and fuel quantity sensor (FF + FQ), or
- From FF only (enter/FF to deselect FQ), or
- From FQ only (enter/FQ to deselect FF).

The pilot can modify this number.

[4R] CRZ TEMP/TROPO — This field displays the temperature at the cruise flight level and the altitude of the tropopause.
The pilot can modify both values.
This field is dashed, when the aircraft sequences the top of climb.

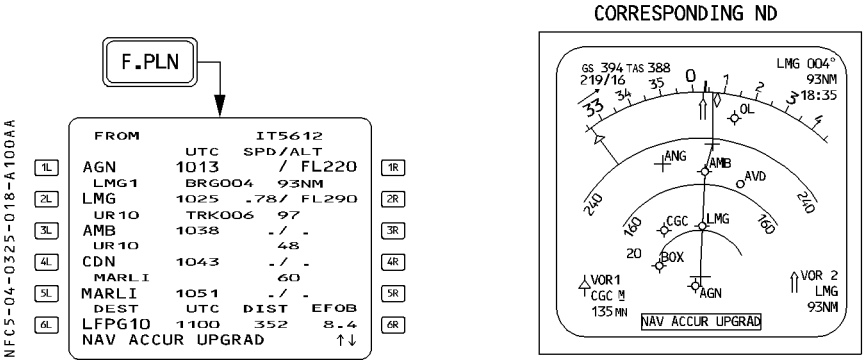
Note : All fields, except [4R], show dashes until the pilot starts an engine.

FLIGHT PLAN PAGES

These pages display all waypoints of the active and alternate flight plans, along with associated predictions.
The pilot can make all revisions to the lateral and vertical flight plans from these pages: He presses the left key to revise the lateral flight plan, and the right key to revise the vertical flight plan.
He presses the F-PLN key on the MCDU console to access the page A of the active flight plan.

FLIGHT PLAN A PAGE

Page A displays time, speed, and altitude predictions for each waypoint of the active flight plan.



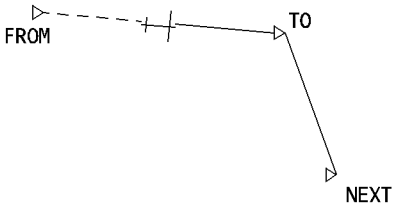
TITLE	FLIGHT NUMBER (blank, if no flight number has been entered). This line may display : TMPY in yellow if a temporary flight plan exists ; OFST in white, if a lateral offset is flown ; or, OFST in yellow, if a lateral offset revision is pending.
Line 1 to Line 5 WPT, UTC, SPD, ALT	These lines display consecutive waypoints alongwith associated predictions of time, speed or Mach and altitude for each. TIME is displayed before takeoff, and UTC after takeoff. After the pilot enters an estimated takeoff time (ETT), UTC is displayed. The time and flight level display at the FROM waypoint (first line of the flight plan) are values that the system memorized at waypoint sequencing.
[1R] SPD/ALT	The field dedicated to SPEED or MACH is blank at the FROM waypoint, except at the departure airport. (V1 associated with runway elevation, is displayed).

Line 6, DEST UTC/TIME DIST, EFOB

DIST is the distance to destination along the displayed flight plan.
EFOB is the estimated fuel on board at destination.
The sixth line is permanent and is displayed in white font once predictions are available, except when a TMPY F-PLN is displayed or in some cases when an ALT CSTR is entered ("*CLB or DES*" prompt appears).

Note : The predicted altitude at a waypoint is related to the QNH below the transition altitude, and is given as a flight level above the transition altitude.

NFC5-04-0325-019-A100AA



The generic flight plan page displays the FROM waypoint (last waypoint to be overflown) on the first line, and the TO waypoint (in white) on the second line. The FROM/TO flight plan leg is called the active leg.
The flight crew can use the scroll keys to review all flight plan legs down to the last point of the alternate flight plan. The AIRPORT key serves as a fast slew key. The pilot can press it to call up the next airport (DEST, ALTN, ORIGIN) to be displayed on the flight plan page.
In order to return to the beginning of the flight plan page, the pilot presses the F-PLN key on the MCDU console.
The display shows the name of the leg between two waypoints, and the distance between them on a line between the lines that identify them. During an approach, this in-between line also defines the angle of the final descent path. For example, "2-3°" indicates that the leg is two nautical miles long, and the flight path angle is –3°.
The display shows the bearing between FROM and TO waypoints as the bearing from the aircraft position to the TO waypoint. It shows track (TRK) between the waypoints shown in lines 2 and 3. This is the outbound track of the next leg.
If the database contains a published missed approach procedure, or if someone has inserted one manually, the display shows it in blue after the destination runway identification. It turns green when the go-around phase becomes active.
After the last waypoint of the missed approach, the display shows the alternate flight plan in NAV mode.
When NAV mode is engaged, the flight crew can only clear or modify the TO waypoint by using the DIR key on the MCDU console.

Predictions

The system calculates and displays predictions for all waypoints.
It uses the current wind to compute TO waypoint predictions, and uses predicted winds to compute all others.

Constraints

The database may define an altitude and speed constraint for each waypoint of the climb, descent, and approach phases, or the pilot may manually insert such constraints (except at origin, destination, FROM, and pseudo-waypoints).
The constraints are displayed in magenta, as long as predictions are not completed.
Once predictions are available, constraints are replaced by speed and altitude predictions, preceded by stars. If the star is in magenta, the system predicts that the aircraft will match the constraint (altitude within 250 feet, speed not more than 10 knots above the constraints). If the star is in amber, the system predicts that the aircraft will miss the constraint and the MCDU displays : "SPD ERROR AT WPT".

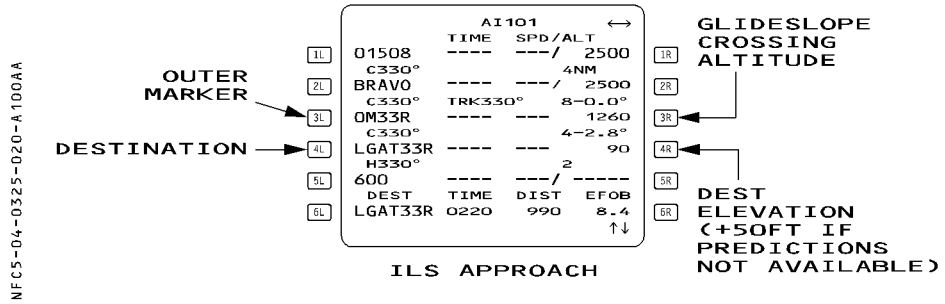
Note : SPD and ALT CSTR may either be entered on the VERT REV page or directly on the F-PLN A page, whereas TIME CSTR may only be entered from the RTA page.

Pseudo-waypoints

Pseudo-waypoints are geographical positions corresponding to an event in the vertical flight plan : T/C (top of climb), T/D (top of descent), SPD/LIM (speed limit), DECEL (deceleration for approach), etc. The display shows them as waypoints in parentheses.

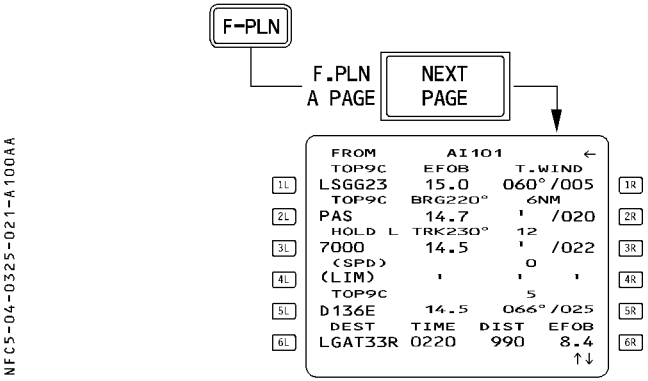
R **Approach display**

R The flight crew cannot enter an altitude constraint at destination or Missed Approach Point
R (MAP).
R



FLIGHT PLAN B PAGE

This page displays fuel predictions and forecast winds at each waypoint.
The pilot calls it up by pressing the NEXT PAGE key when the FLIGHT PLAN A page is displayed.

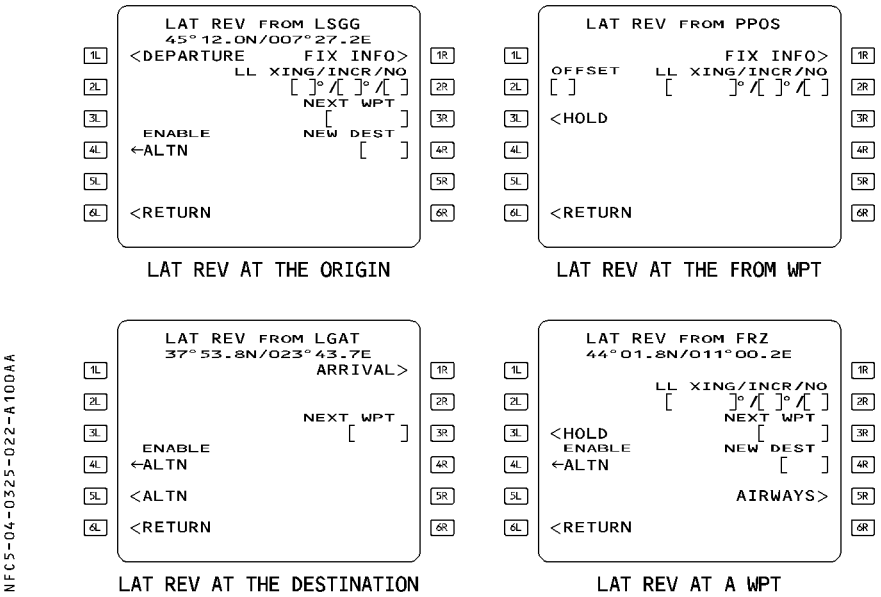


NFC5-04-0325-021-A100AA

TITLE	FLIGHT NUMBER (blank if no flight number has been entered).
Line 1 WPT-EFOB-WIND to Line 5	These lines display consecutive waypoints and associated fuel predictions, and the forecast wind profile. The direction of forecast winds is relative to true north. Forecast winds include winds entered by the pilot (large font) and the propagated winds at intermediate waypoints (small font). If the flight crew uses a trip wind, it will be displayed for each waypoint. If no other wind entry is made after takeoff, the FROM waypoint will display the actually recorded wind, and the waypoints downpath will still display the trip wind.
Line 6 DEST-UTC/DIST-EFOB	Identical to F-PLN A page.

LATERAL REVISION PAGES

These pages give the pilot a list of the lateral flight plan revisions, which can be used to change the flight plan beyond a selected waypoint.
The pilot calls up these pages from the flight plan pages (A or B) by pressing the left key adjacent to the selected waypoint.
Different lateral flight plan revisions are available for different waypoints.



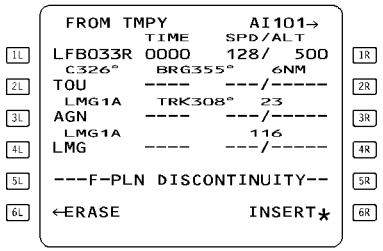
NFC5-04-0325-022-A100AA

TITLE	The ident of the waypoint or airport selected for revision, along with its latitude and longitude. If the selected waypoint is the FROM waypoint, the title omits the aircraft latitude and longitude, and displays the “PPOS” (present position) instead.
[1L] DEPARTURE	This prompt gives the pilot access to the departure pages, where he can select and insert runways, SIDs, and TRANSs.
[2L] OFFSET [ ]	This prompt allows the pilot to enter a lateral offset, left or right, in the flight plan. The offset may be between 1 and 50 NM. When the pilot enters an offset, the OFFSET field becomes yellow and the 6L and 6R fields display ERASE and INSERT. The pilot can delete an inserted offset either by pressing the CLR pushbutton, by entering a zero for the amount of the offset, or by selecting a DIR TO.

[3L] HOLD	This prompt gives access to the hold pages.
[4L] ENABLE ALTN	This prompt allows the pilot to switch to the alternate flight plan at the selected revision waypoint, and use it as a new active flight plan. The system never displays this prompt at the FROM waypoint.
[5L] ALTN	This prompt gives access to the alternate airport page. The system displays it only at the destination.
[6L] RETURN	This prompt returns the display to the flight plan page.
[1R] ARRIVAL	This prompt calls up the arrival pages, where RWY, APPR, STAR TRANS and VIA can be selected and inserted.
[1R] FIX INFO	FIX INFO is only displayed on the lateral revision page at the origin or FROM waypoint. It gives access to the FIX INFO page.
[2R] LLXING/INCR/NO	This prompt allows the pilot to create the latitude/longitude crossing point. The increment (INCR) ranges from 1 to 20 degrees, and the number of crossing points from 1 to 99.
[3R] NEXT WPT	The pilot uses this prompt to enter the next waypoint. If this waypoint is a latitude/longitude, or is neither in the database nor in the pilot-defined elements, the display reverts to the NEW WAYPOINT PAGE.
[4R] NEW DEST	The pilot uses this prompt to enter a new destination.
[5R] AIRWAYS	The pilot uses this prompt to access the AIRWAYS page.
[6R] INSERT	This prompt is displayed when the pilot has created a temporary flight plan. It can be used to activate the temporary flight plan.

TEMPORARY REVISION

When the pilot selects a lateral revision, the system creates a "Temporary F-PLN" and displays it in yellow on the MCDU, and as a dashed yellow line on the ND, enabling the pilot to review the data before inserting it. As long as the temporary flight plan is not inserted, the previous flight plan remains active and the system guides the aircraft along it.

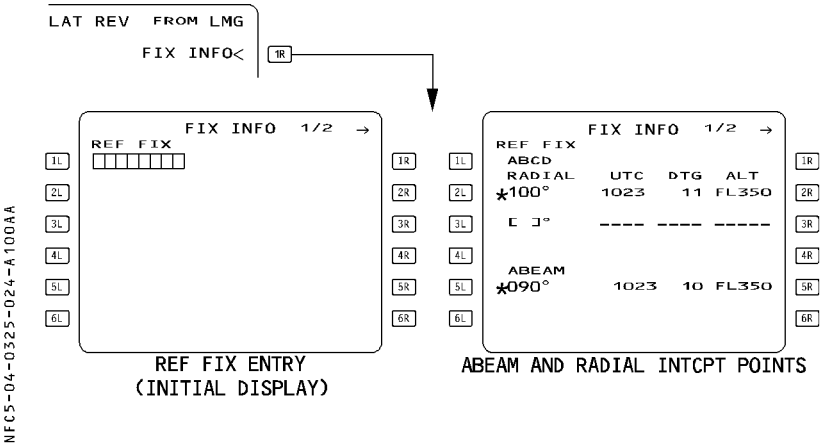


TEMPORARY F-PLN A PAGE

NFC5-04-0325-023-A100AA

FIX INFO PAGE

This page provides access to the RADIAL intercept function.
The reference may be one or more radial bearings, based on a given database fix or a pilot-defined element.
If the radial intercepts the active flight plan, the intersection point can be converted to a waypoint and inserted into the flight plan. If not, the ABEAM function may be used.
The FIX INFO page may be accessed from the lateral revision page at origin, or at the FROM waypoint.



[1L] REF FIX (blue)
Allows entries of the REF FIX. This reference may be any database element (navaid, waypoint, NDB, airport, runway) or a pilot-defined element. Prior to entry, amber boxes are displayed.

Line 2 to line 4 RADIAL (blue)
Allows entry of a radial from the REF FIX.
If the radial line intersects the active flight plan, the FMGS will compute the time, the along path DTG (Distance To Go), and the altitude at the intersection point (small green font). A large blue star is then displayed to insert the intersection waypoint into the flight plan. This waypoint is not part of the pilot-stored elements. Format of the created waypoint is :
XXXNNN XXX = First 3 letters of REF FIX ident.
NNN = Value of the radial

[5L] - [5R] ABEAM

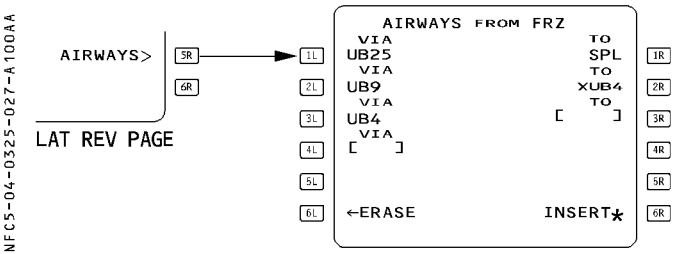
This function enables the pilot to create waypoints on a flight plan (primary or secondary) that are abeam a reference fix.
Once computed, the page displays the radial number in large green font. Time, distance and altitude predictions are displayed in small green font.
Selecting the key adjacent to the star creates the waypoint and inserts it into the flight plan.
The waypoint is identified by AB + the REF FIX ident e.g. AB TLS.
Abeam waypoints are not stored in the pilot-stored waypoint database.

Note : Two FIX INFO pages, providing the capability to define two different REF FIX elements, are available.

INTENTIONALLY LEFT BLANK

AIRWAYS PAGE

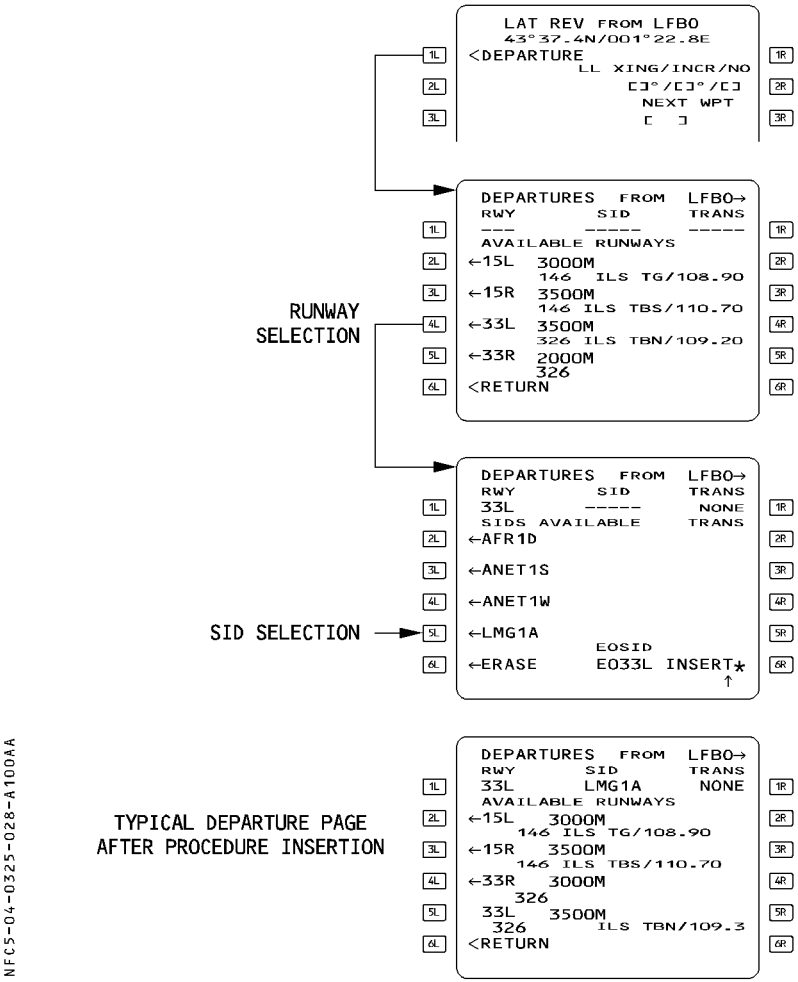
This page allows the pilot to select up to five airways for stringing into the flight plan, after the revise waypoint.
The pilot calls up this page by pressing the lateral revision page [5R] key.



TITLE	Revise point ident (large green font)
[1L] VIA to [5L]	This field displays the airways entered by the pilot.
[6L] ERASE or RETURN	The flight crew presses this key to return to the lateral revision page. This field displays ERASE when a temporary flight plan is created. It enables the temporary flight plan to be erased.
[1R] TO to [5R]	Displays the end points of the corresponding airways entered on the [1L] to [5L] entries. The ending point is displayed in large blue font, if manually-entered, in blue small font if FMGC-computed.
[6R] INSERT (amber)	Allows the entered VIA/TO segments to be inserted into the flight plan. The display reverts to the F-PLN page.

DEPARTURE PAGES

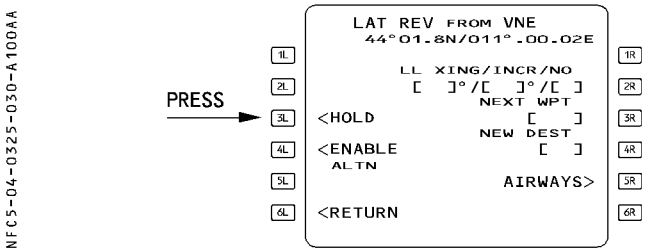
These pages allow the pilot to review departure procedures (RWY, SID, TRANS) and enter them into the active flight plan.
When the display shows the lateral revision page for the origin, the pilot calls them up by pressing the 1L key.
Three pages are available : RWY, and SIDS and TRANS (if any).
The pilot sequentially calls up each page by selecting a data item (such as RWY), or by pressing the NEXT PAGE key on the MCDU console.



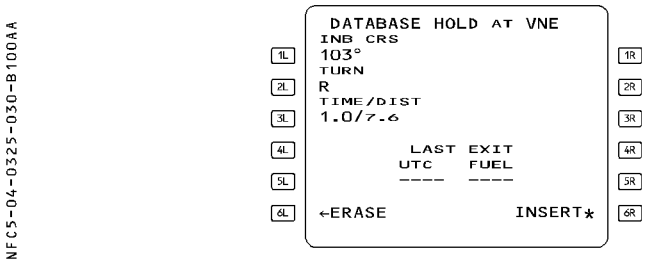
Line 1 RWY, SID TRANS	This line displays the RWY, SID, and TRANS in green after they have been inserted into the active flight plan, or in yellow if selected but not yet inserted. If nothing has been selected or inserted, the line displays dashes.
[2L] RWY/SIDs to [5L]	These fields display selectable and selected RWYs or SIDs (including EOSID and NO SID option). The pilot can slew each list. Selectable RWYs and SIDs are displayed in blue with an arrow. Once a RWY or SID is selected, the arrow disappears. A RWY or SID, already inserted in the flight plan, is displayed in green. The display shows the length, heading, and, if available, the ILS ident and frequency for each runway.
[6L] ERASE or RETURN	The pilot presses this key to erase a selected data item and revert to the previous selection. If the pilot erases the page, the display reverts to the active flight plan page. The display shows RETURN instead of ERASE, when the pilot has not created a temporary flight plan.
[2R] TRANS to [5R]	This field displays the selectable and selected enroute transitions in blue and green respectively. They are blank, if there are no transitions.
[6R] INSERT or BLANK	The pilot uses this key to insert a temporary procedure into the flight plan. The page reverts to the active flight plan page, when the insertion is completed. It is associated with RETURN (6L).
[6M] EOSID	Once a runway is inserted into the flight plan, this field displays any ENG OUT SID for that runway. If there is none, it displays NONE.

HOLD PAGES

These pages allow the pilot to review and modify the holding pattern parameters at the selected revise waypoint. The holding pattern data may come from the database or may be defaulted to standard dimensions.
The pilot calls up these pages by pressing the HOLD key on the LAT REV page for the waypoint. Three different HOLD pages are available :



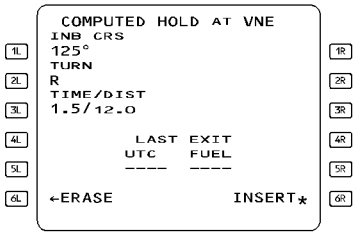
- **DATABASE HOLD AT...**
  The database has a holding pattern for the selected revise waypoint, but has not yet been inserted in the flight plan.



- **COMPUTED HOLD AT...**

  The database has no holding pattern for the selected revised waypoint.
  The system proposes default holding pattern data.

NFC5-04-0325-031-A100AA

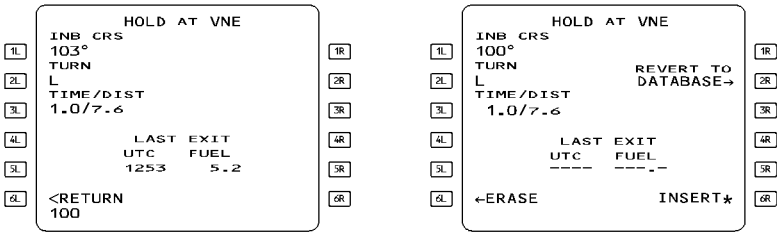


INB CRS = INBD TRK of the F-PLN leg leading to the revised waypoint.
TURN = Turn direction right.
TIME on outbound leg is 1.5 minutes above 14000 feet, 1 minute below 14000 feet.
[2R] field shows "REVERT TO COMPUTED", when the pilot has modified the holding pattern.

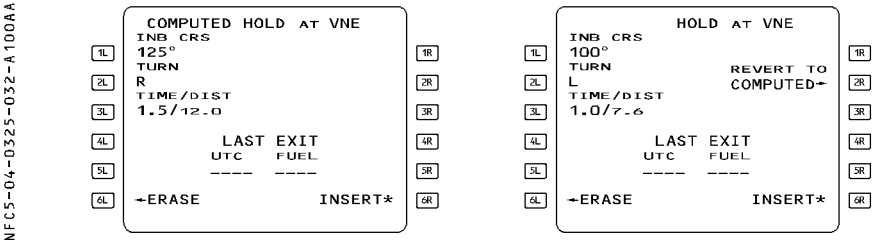
- **HOLD AT...**

  The flight plan contains a holding pattern that was defined by the pilot from an existing database or computed hold.
  If the pilot has modified holding pattern data from the database, the field next to [2R] displays "REVERT TO DATABASE" or "REVERT TO COMPUTED" to enable the pilot to revert to default parameters.

NFC5-04-0325-031-B100AA

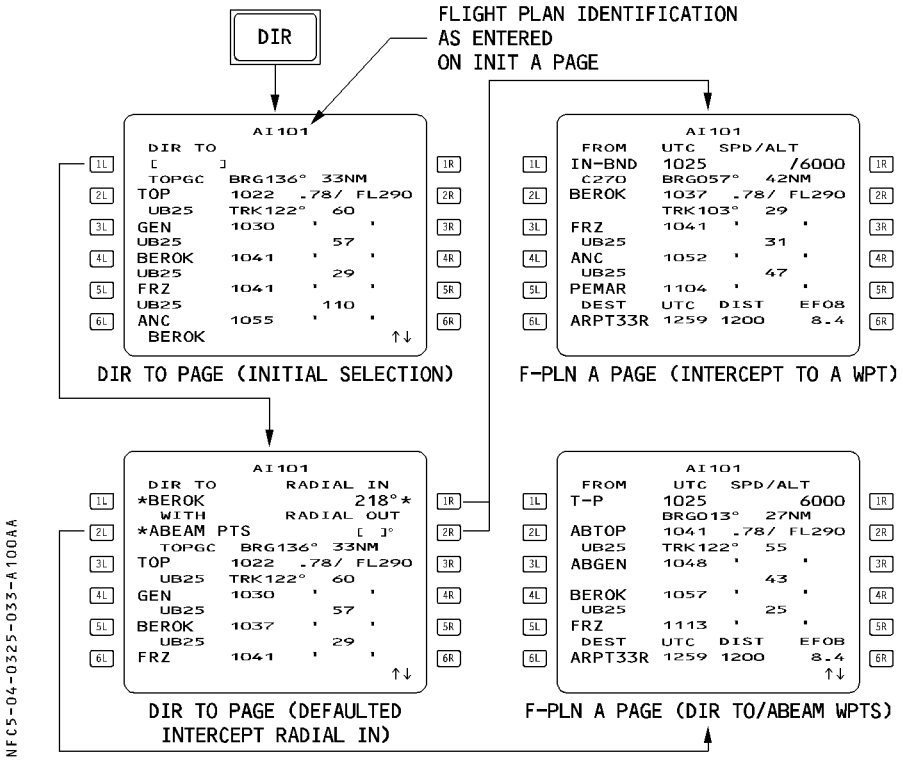


Example : The pilot modifies the inbound course.



[1L] INB CRS	This field displays the inbound course of the holding pattern. The data may be modified.
[2L] TURN	This field shows the direction to turn in the hold (L or R). The data may be modified.
[3L] TIME/DIST	This field shows the time and distance for the outbound leg. The data may be modified. Time and distance are dependent values that the system calculates from the predicted true airspeed, which in turn depends upon the holding speed (speed for maximum endurance, ICAO speed limit, or constraint speed, whichever is lower).
[6L] ERASE or RETURN	The pilot presses this key when the field shows “ERASE”, to erase the holding pattern. The pilot presses this key when the field shows “RETURN”, to return to the LAT REV page, if the hold is already inserted in the flight plan.
[2R] REVERT TO DATABASE or REVERT TO COMPUTED	The pilot presses this key to delete manual modifications to the database hold (or computed hold), and to revert to the database (or computed) holding data.
[6R] INSERT	The pilot presses this key to insert the hold into the active flight plan.
LAST EXIT UTC FUEL	This field displays the time at which the aircraft must leave the holding pattern in order to meet fuel policy criteria (extra fuel = 0). The system also displays the estimated fuel on board at that time. Always displayed in thousand of kilograms.

DIRECT TO PAGE



Pressing the "DIR" key under the MCDU screen brings up the DIR TO page. On this page, the [1L] key is the DIR TO key. The pilot presses it to modify the flight plan by creating a direct leg from the aircraft's present position to any selected waypoint. When in NAV mode, the pilot must use this key to modify the active leg or the TO waypoint. The pilot cannot call up this page when the aircraft's present position is not valid.

[1L] DIR TO Pressing this key selects the DIRECT TO or INTERCEPT waypoint. The pilot can identify the waypoint to be inserted by using its identifier, its latitude and longitude, place/bearing/distance, or place-bearing/place-bearing.

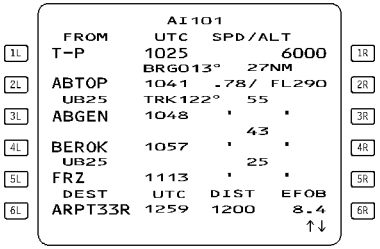
Note : If the entered DIR TO is a latitude/longitude, the NEW WAYPOINT page is automatically called up.

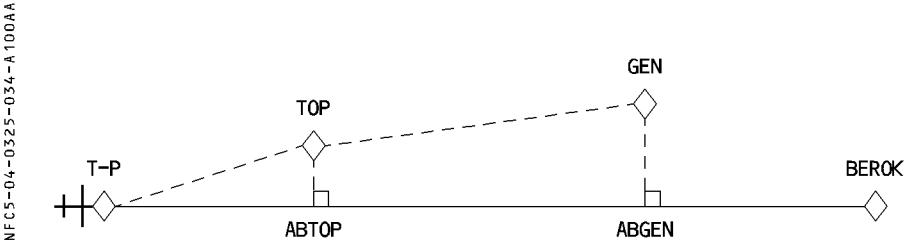
If the pilot does not select the RADIAL IN (1R) or RADIAL OUT (2R) or ABEAM PTS (2L), the DIR TO function routes the aircraft from the present position to the waypoint inserted in the DIR TO field.

Line 3 to Line 6 — These lines display the active flight plan with time/speed/distance predictions. The display may be slewed ↑↓.
Pressing any key activates the DIRECT TO function from the present position to the waypoint adjacent to that key.

[2L] ABEAM PTS — The flight crew presses this key to activate the DIR TO/ABEAM function which projects the flight plan waypoints perpendiculary on the DIR TO leg :

Example : DIR TO BEROK - ABEAM.

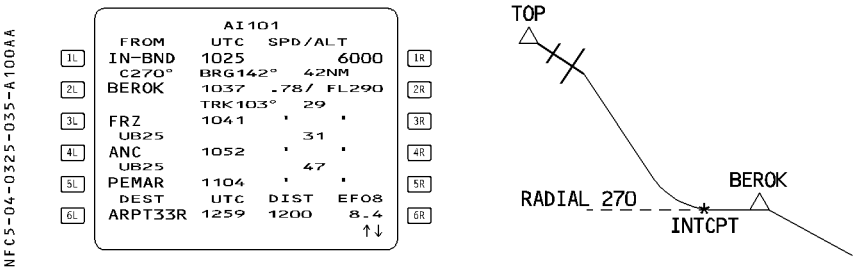




[1R] RADIAL IN
and
[2R] RADIAL OUT

The pilot fills in these fields to define a radial, associated to the waypoint defined in 1L. These keys respectively activate the DIRTO/INTERCEPT TO and DIRTO/INTERCEPT FROM functions.
The pilot enters the radial in, or radial out, as : XXX, XXX being the radial.
The aircraft intercepts from its current position and tracks the selected waypoint and radial to (or from) this waypoint.

Example : RADIAL INBND
DIR TO BEROK - RADIAL 270° INBOUND.

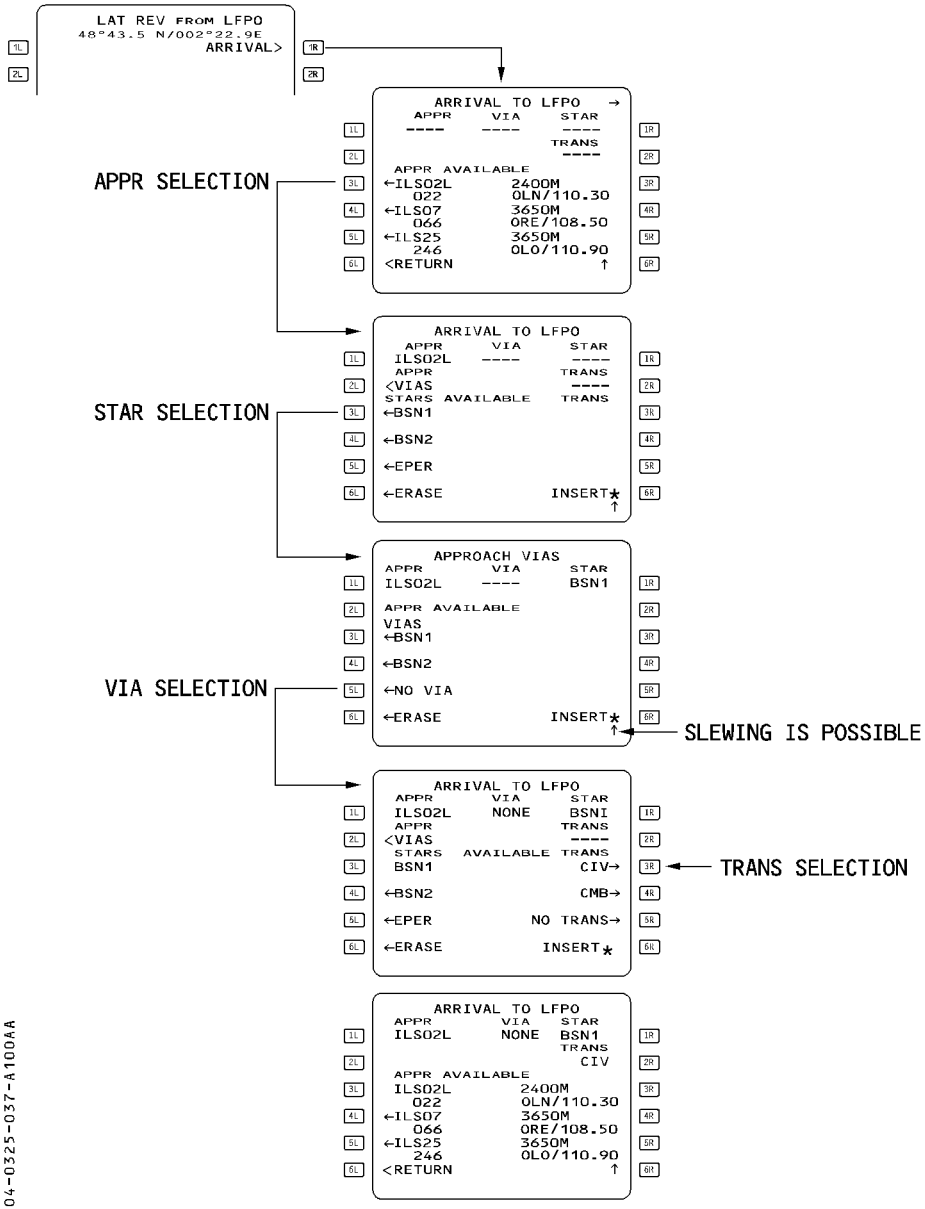


If the DIR TO/INTCPT WPT entry is to a waypoint already in the flight plan, a default RADIAL IN is displayed in small font. However, no radial is displayed on the ND for this default radial. No default radial is provided for the RADIAL OUT field.
Selecting the INTCPT TO (RADIAL IN [1R]) function :
– Activates the intercept radial INTO the WPT.
– Sets the course = radial IN + 180°.
– Reverts the display to the F-PLN A page.
Selecting the INTCPT FROM (RADIAL OUT [2R]) function :
– Activates the intercept radial FROM the WPT.
– Sets the course = radial OUT.
– Reverts the display to F-PLN A page.
For details, refer to 4.04.

ARRIVAL PAGES

These pages enable the pilot to review arrival procedures (approaches, VIAs, STARs, TRANS) and enter them into the active flight plan.
The pilot calls them up from the LAT REV page for the destination by the pressing the 1R key.
Three pages, APPR, STAR, and VIA, are available, along with a fourth, TRANS, if there are any transitions.
The pilot calls up each page sequentially, either by selecting a data item (such as APPR), or by pressing the NEXT PAGE key on the MCDU console.

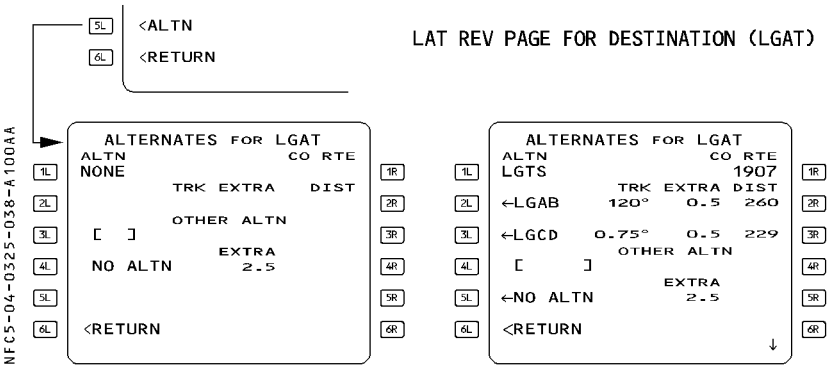
Line [1L] - [1R] [2R]	This line displays the APPR, VIA, STAR, and TRANS in green, if they have been inserted in the flight plan, and in yellow, as a temporary flight plan, if they have been selected but not yet inserted. It displays dashes or NONE, if nothing has been selected or inserted.
[2L] APPR VIAS	The pilot presses this key to call up transitions from the last point of the STAR to the first point of the approach.
[3L] to [5L]	These fields list selectable and selected APPRs, STARs, and VIAs. The flight crew can slew the pages, when necessary. Selectable APPRs, STARs, and VIAs are displayed in blue with an arrow. Once the pilot has selected an APPR, STAR, or VIA, the arrow disappears. After the APPR, STAR, or VIA is inserted into the flight plan, it is displayed in green. For each approach, the display shows runway length, heading, and the frequency and identifier of the ILS when ILS is available.
[6L] ERASE or RETURN	The pilot presses this key to erase selected data and to revert to the previous selection. The page reverts to the LAT REV page. The field displays “RETURN”, instead of ERASE, when the flight crew has not created a temporary flight plan.
[3R] TRANS to [5R]	These fields display selectable and selected enroute transitions (if any). They are blue when selected, and become green when inserted into the active flight plan.
[6R] INSERT	The pilot presses this key to insert the temporary procedure into the active flight plan. The page reverts to the active flight plan page when this occurs.



NFCS-04-0325-037-A100AA

ALTERNATE PAGE

This page enables the pilot to review, in the NAV database, the alternate airports that are paired with the destination, and define additional alternates, if needed. (Alternate airports are linked to the destination). The pilot calls up this page with the ALTN prompt, from the lateral revision page for the destination.



	TITLE	The destination airport is displayed large green font.
	[1L] ALTN	This field displays the selected alternate : In green, if it is active ; in yellow, if it is temporary. “NONE” is displayed, if NO ALTN option is selected, or if the destination has no alternate.
R	Line 2 to line 5	These lines display the identifications of alternates (up to 6), the extra fuel weight remaining after landing at the alternates, and the great-circle track and distances to them from the destination. If the database contains a company route between the destination and the alternate, the distance shown is an airway distance, not a great-circle distance. When the database defines a preferred alternate, it is displayed on Line 2 (if no scrolling has been performed).

[4L] OTHER ALTN — The pilot can enter an airport identifier in the brackets (Line 3). If that airport is not stored in the database , the NEW RUNWAY page appears for the pilot to use in defining it.
If it is stored in the database , the ROUTE SELECTION page appears, and the pilot can use it to select the best route.
The pilot may enter a distance in the DIST field of the OTHER ALTN prompt, in order to get preliminary fuel predictions. However, once he has selected the alternate airfield as a temporary alternate and then inserted it, the ALTN distance reverts either to the airway distance, if he has selected a company route, or otherwise to the direct distance to the alternate.
The pilot can use OTHER ALTN to overwrite and replace the previous OTHER ALTN.

NO ALTN — The pilot uses this key to select the NO ALTN option.

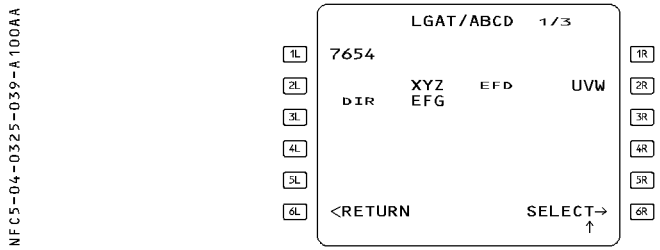
[6L] RETURN or ERASE — The pilot presses this key to make the display revert to the LAT REV page.
Pressing this key erases the temporary selection.

[1R] CO RTE — Pressing this key displays the active company route between the destination and the selected alternate.

[6R] INSERT — Pressing this key activates the temporary selection.

ROUTE SELECTION PAGE FOR ALTERNATE

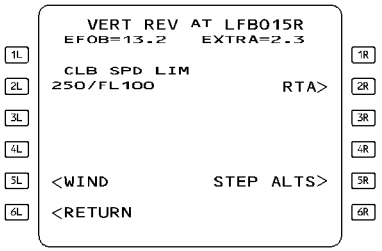
This page enables the pilot to review the company route between the destination and the alternate, and to select a different route, if that seems appropriate.
This page comes up automatically, when the flight crew enters an ident in the OTHER ALTN field.
See the "Route Selection" page for a description of this page.



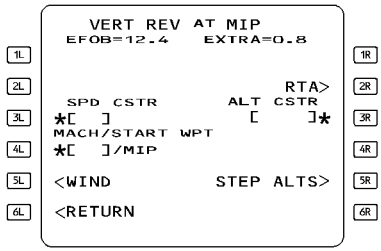
[6R] SELECT — Pressing this key reverts the display to the alternate page. (The distance between the destination and the alternate is then the airway distance).

VERTICAL REVISION PAGES

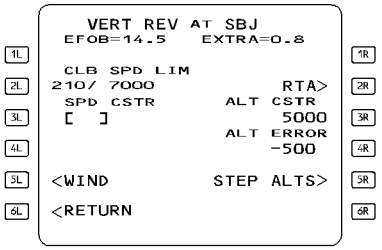
These pages contain the menu of available vertical flight plan revisions that can be applied at a selected waypoint.
The pilot calls up these pages from the flight plan A or B pages by pressing the right hand key next to the selected revised waypoint.
The pilot may make several different vertical revisions (although some may not be available at all waypoints) : Speed limit, speed constraint, altitude constraint, time constraint, wind page and STEP ALTS page.



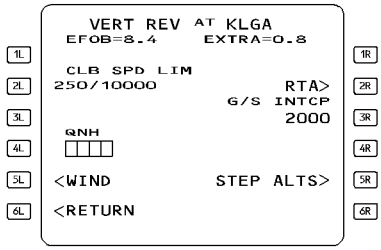
VERT REV AT ORIGIN



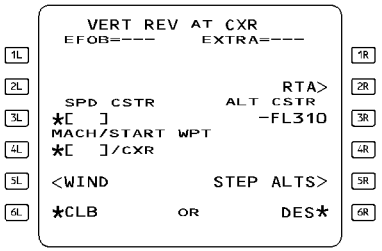
VERT REV AT CRUISE WPT



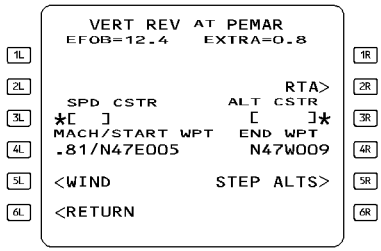
VERT REV AT WPT IN CLIMB.
(ALT CSTR ENTERED AND
PREDICTED MISSED)



VERT REV AT DEST



VERT REV AT WPT
(PREDICTIONS NOT AVAILABLE)



VERT REV WITH CONSTANT MACH SEGMENT
DEFINED BETWEEN N47E005 AND N47W009
(BOTH WAYPOINTS ARE IN CRZ PHASE)

NF65-04-0325-040-A100AA

TITLE (white)	"VERT REV AT [location]" The second line shows remaining fuel and extra fuel at the waypoint being revised.
[1L] "TOO STEEP PATH BEYOND" (amber)	This message is displayed, if the waypoint is part of a leg with too steep a descent path.
[2L] CLB/DES SPD LIM (magenta)	This field displays the speed limit applicable to the climb or descent phase. It displays it in large font when data has been inserted manually, and in small font when data comes from the database.
[3L] SPD CSTR (magenta)	This field displays any speed constraint assigned to the revised waypoint. It is in large font when inserted manually, and in small font when it comes from the database. It is not displayed at the origin airport, at a FROM waypoint, a speed limit pseudo waypoint, or the destination airport.
[4L] QNH	This field only functions when the revised waypoint is the primary destination. It allows the pilot to enter the atmospheric pressure at sea level. This field is identical to the QHN field of the PERF APPR page.
[4L] MACH/START WPT (blue)	This prompt allows the pilot to enter or modify the start point of a constant Mach segment, and its associated Mach. It is not displayed at primary destination and alternate flight plan waypoints. (Refer to 4.04.25).
[5L] WIND (blue)	The pilot presses this key to access the wind pages. The first wind displayed page, corresponds to the selected waypoint (e.g. climb page), if the selected waypoint is a climb phase waypoint. A CLR action reverts it to brackets.
[6L] RETURN or CLB	The pilot presses this key to return to the last displayed flight plan page. When displayed, pressing this key assigns the constraint to CLB phase and inserts it into the vertical flight plan. The page reverts to the flight plan page.
[2R] RTA prompt	This prompt gives access to the RTA page. It is not displayed when the VERT REV page is accessed from the alternate F-PLN.

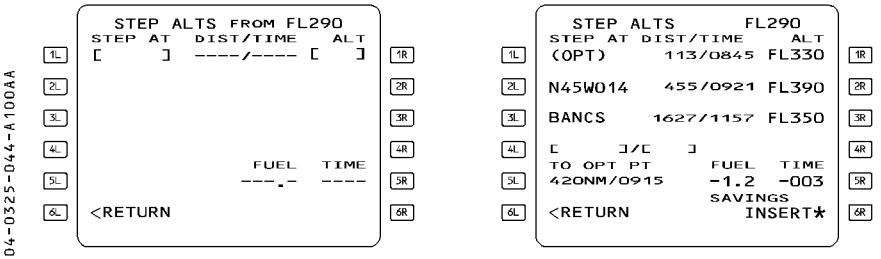
[3R] ALT CSTR (magenta)	This field displays the altitude constraint assigned to this revised waypoint. It uses large font when the constraint is manually-entered, and small font when it is from the database. A CLR action reverts it to brackets. The constraint may be : · "At", entered as XXXXX (Example : FL180). · "At or above", entered as + XXXXX or XXXXX + (Example : + FL310). · "At or below", entered as – XXXXX or XXXXX – (Example : – 5000). · A "window" constraint. The altitude window consists of two altitudes between which the aircraft should fly. The crew cannot manually enter a "window" constraint.
G/S INTCP (green)	This field displays the glide intercept altitude for an ILS approach on the vertical revision page at destination.
[4R] ALT ERROR (green)	When the aircraft misses a predicted altitude constraint, this field displays the difference between the altitude constraint and the predicted altitude. If, for example, "– 500" appears in this field in green, the aircraft will reach the waypoint at an altitude 500 feet below the constraint altitude. This only applies to waypoints in the climb and descent phases.
[4R] END WPT (blue)	This prompt allows the pilot to enter or modify the endpoint of a constant Mach segment. It is displayed when a pair Mach/start exists in 4L field. This prompt is not displayed on the destination VERT REV page. (Refer to 4.04.25).
[5R] STEP ALTS (white)	This legend appears for any waypoint, once a cruise altitude has been entered. It is not available in engine-out, descent, approach, and go-around phases. This gives the pilot access to the STEP ALTS page.
[6R] DES	When this field displays "DES", pressing this key assigns the constraints to the descent phase and inserts them into the vertical flight plan. The page reverts to the F-PLN page. (See note below).

Note : Altitude and speed constraints may apply to the climb, descent, or approach phase, but never to the cruise phase. Fields 6L/6R display "CLB/DES" when the revised waypoint is a cruise phase waypoint and the FMGS needs to know if the new constraint is to be applied in climb or descent phase. The FMGS will modify the cruise phase accordingly. These 2 prompts also display "CLB/DES" when the predictions are not computed. (Top of climb and top of descent not yet defined).

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STEP ALTS PAGE

This page allows the pilot to insert up to four geographic step points and one optimal step point into the flight plan. This page also displays the cost savings associated with the optional step.
The pilot calls it up either from the vertical revision page, or from the performance cruise page.



PAGE FILLED WITH GEOGRAPHIC AND OPTIMAL STEPS

TITLE	STEP ALTS followed by the current cruise altitude
Line 1	In this field, the pilot can enter either a geographic step or an altitude for an optimal step.
Line 2 to line 4 STEP	AT (large blue font) The pilot can only enter geographic steps in these fields. Displays the point at which the active step begins. It may either be an active (or secondary) flight plan waypoint, or an inserted optimal point (OPT).
DIST / TIME (UTC) (small green font)	Displays the distance to go, and time from the present aircraft position along the flight plan to the step point.
ALT	Displays the altitude to step to, and allows entry of the optimal step format : FL or ALT.

Note : The following messages may be displayed in the DIST / TIME field :

- *ABOVE MAX, if the step altitude exceeds the Max altitude.*
- *IGNORED, if the start step point is less than 50 NM from the top of descent.*
- *STEP NOW when the aircraft is within 20 NM of the step point.*
- *NO OPTIMAL, if an inserted optimal step falls in a discontinuity due to a flight plan change, or if a time constraint exists in the flight plan.*

[5L] TO OPT PT (green small font)
This field displays the distance and time to an uninserted optimal step point, if one exists.

[6L] RETURN
The flight crew presses this key to return to the previous page.

Note : On any flight plan change, an inserted optimal step remains in the flight plan at a fixed distance to destination.

[5R] SAVINGS
This field displays the fuel and time savings prior to the insertion of the optimal step point.
Fuel savings are displayed in thousand of kilograms (or pounds) (maxi 99.9). The value is preceded by :
"–" in case of fuel saving,
"+" in case of additional fuel cost.
Time savings are displayed in hours and minutes.
The value is preceded by
"–" in case of time saving,
"+" in case of additional time cost.

Note : If no optimal step point exists for the altitude displayed in [1R], the "NO OPTIMAL" message is displayed in the FUEL / TIME field. This message is also displayed, if the optimal step falls into a discontinuity.

[6R] INSERT (amber)
This field displays INSERT, when an optimal step point exists but is not yet inserted. When INSERT is selected :
– The optimal step point is inserted into the flight plan.
– OPT is displayed in line 1L.
– Optimal step distance and time are deleted in line 5L.
– The * UPDATE blue prompt replaces the INSERT prompt.

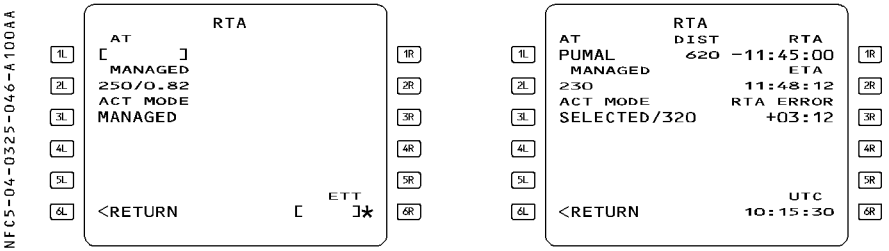
UPDATE
This prompt enables the computation of another optimal step point.
The UPDATE prompt is then replaced by the *INSERT prompt.

RTA PAGE

The Required Time of Arrival (RTA) page allows the entry and display of a waypoint identifier, with associated time constraints. The page also displays the entered or computed Estimated Takeoff Time (ETT), as well as the following data :

– Predicted ETA at the time-constrained waypoint ;
– Performance adjusted SPD target ;
– Time error ;
– Distance to time constrained waypoint ;
– Active speed mode ;

The pilot calls up this page with the RTA prompt from the vertical revision page.

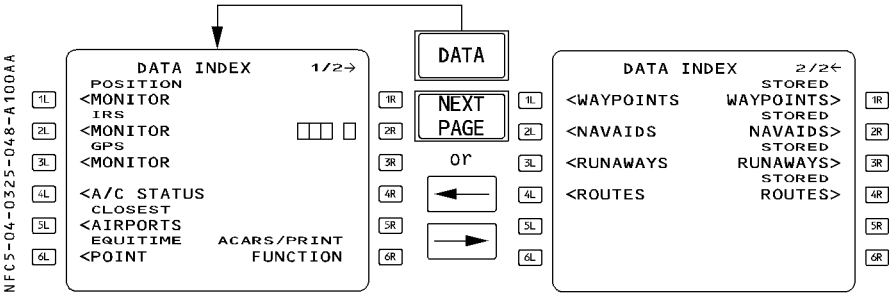


TITLE	RTA (large white font)
line 1	This line displays AT and blue brackets, if no time constraints exist, or AT, DIST and RTA when a time constraint has been defined. The waypoint identifier is displayed in large blue font. If only the waypoint identifier has been defined, blue brackets and a blue star are displayed facing the 1R prompt. The pilot enters the time constraint as "HHMMSS", preceeded by: – for at or before ; + for at or after ; no sign for at.
[2L] MANAGED	This field displays the FMGS-computed ECON speed/Mach (refer to 4.02.20)

[3L] ACT MODE	This field displays the active speed mode : MANAGED or SELECTED/NNN (NNN is the selected target speed). The pilot cannot modify it through this field.
[6L] RETURN	The pilot presses this key to revert the display to the VERT REV page.
[2R] ETA	When a required time at arrival has been defined, the 2R field displays the estimated time of arrival as "HHMMSS".
[3R] RTA ERROR	This field is blank when the RTA is predicted as made. If the RTA is predicted as missed, "RTA ERROR" is displayed in small white font, and the time error between ETA and RTA is displayed in small amber font.
[6R] ETT	The Estimated Takeoff Time (ETT) field is available in the preflight phase. If no ETT is available, the 6R field displays blue brackets and a blue star. Once available, the ETT is displayed in magenta.
UTC	Universal time is displayed in green for takeoff, climb, cruise, descent and approach phases.

DATA INDEX PAGES

There are two INDEX pages :
The DATA INDEX 1/2 page gives access to various pages devoted to navigation.
The DATA INDEX 2/2 page lists the navigation data, entered in the FMGS.
The pilot enters those items labeled "stored" and can modify them. The pilot can call up the others, but cannot modify them.
The pilot calls up these pages by pressing the DATA key on the MCDU console :



DATA INDEX 1/2 PAGE

[1L] POSITION MONITOR -
[2L] IRS MONITOR
[3L] GPS MONITOR
[4L] A/C STATUS
[5L] CLOSEST AIRPORTS.
[6L] EQUITIME POINT
[6R] ACARS/PRINT

When the flight crew presses these keys, the display shows all essential navigation data.
This key calls up the GPS MONITOR page.
This key calls up the aircraft status page.
This key calls up the closest airports page.
This key calls up the equitime point page.
This key calls up the PRINT function pages and the ACARS function pages.

DATA INDEX 2/2 PAGE

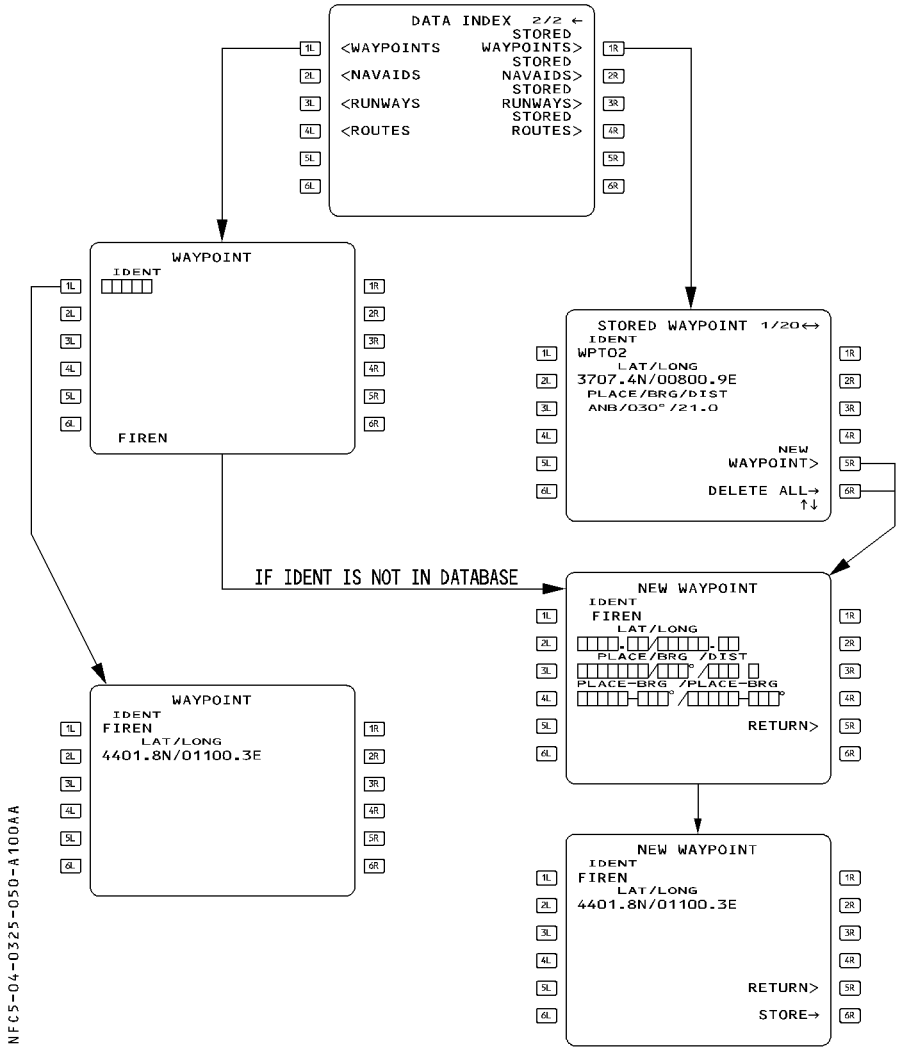
[1L] WAYPOINTS
[2L] NAVAIDS
[3L] RUNWAYS
[4L] ROUTES

These keys call up descriptions of waypoints, navaids, runways, and routes stored in the database, so that they can be reviewed.

[1R] STORED WAYPOINTS
[2R] STORED NAVAIDS
[3R] STORED RUNWAYS
[4R] STORED ROUTES

These keys call up waypoints, navaids, runways, and routes that the pilot has stored, enabling the pilot to review and store them in, or delete them from, the database.
The airline can choose to automatically have all pilot-stored data erased in the done phase.

WAYPOINT/STORED WAYPOINT/NEW WAYPOINT PAGES



WAYPOINT PAGE

- The pilot can call up this page by pressing the 1L key on the DATA INDEX page. The display then shows waypoint information associated with the identifier the flight crew inserts it in the [1L] field.
- With this page it is possible to call any waypoint not stored in the stored waypoint list, if they belong to the active, temporary, or secondary flight plan.

STORED WAYPOINT PAGE

The pilot calls up this page by pressing the 1R key on the DATA INDEX page.
This page displays waypoints, defined and stored by the pilot. It lists each stored waypoint, along with a number that shows the relative order in which it was inserted in the database. This number is displayed in the upper righthand corner of the page. For example, "1/20" indicates that the waypoint was the first of 20 stored.

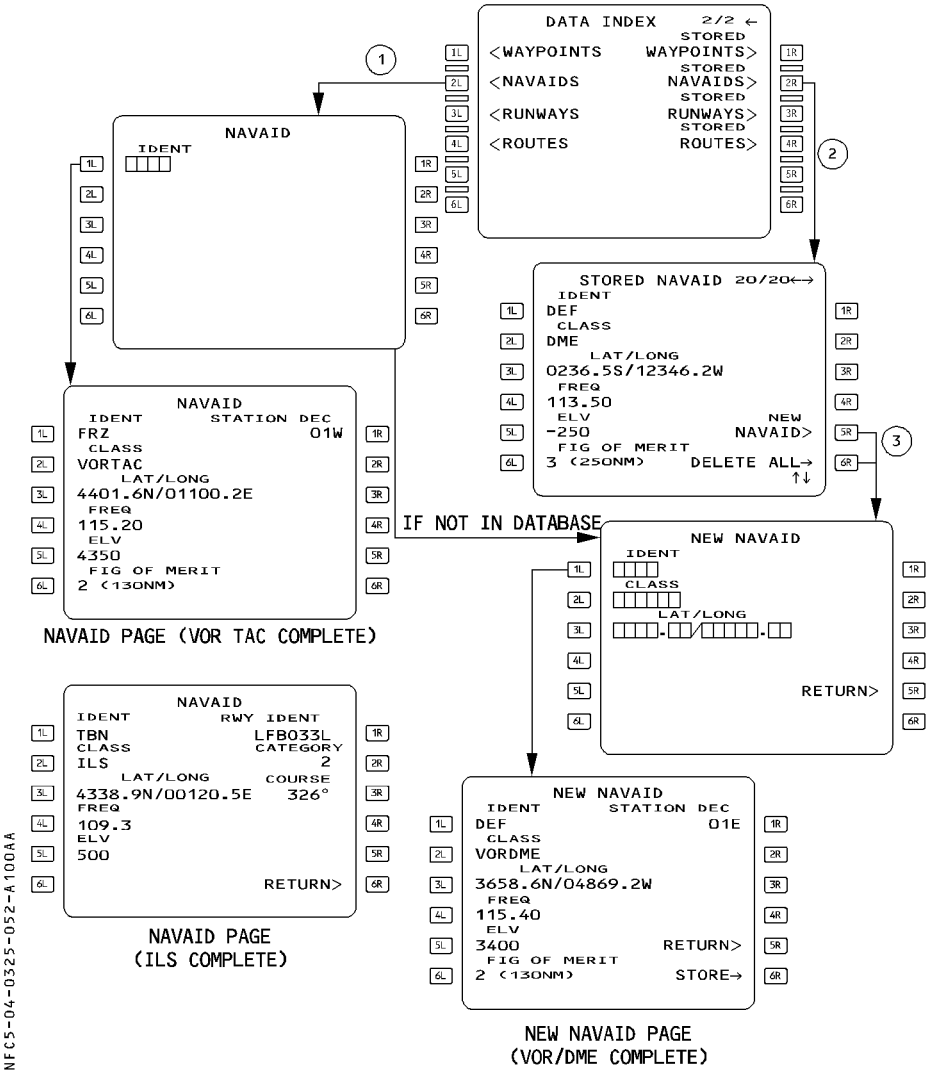
Note : Latitude/Longitude crossing points and Abeam/Radial Intercept points are never included in the stored waypoint list.

[1L] IDENT	To delete a waypoint, the pilot clears the 1L ident display.
[2L] LAT/LONG	Latitude and longitude of the waypoint are displayed in this field.
[3L]	This field either displays PLACE/BRG/DIST or PLACE-BRG/ PLACE-BRG or PLACE/DIST, depending on how the waypoint was defined.
[5R] NEW WAYPOINT	The pilot presses this key to call up the NEW WAYPOINT page.
[6R] DELETE ALL	The pilot presses this key and the label changes to amber CONFIRM DELETE ALL. Pressing this key a second time deletes all the waypoints, stored by the flight crew, except those currently used in the active or secondary flight plan. ("F-PLN ELEMENT RETAINED" appears on the MCDU).

NEW WAYPOINT PAGE

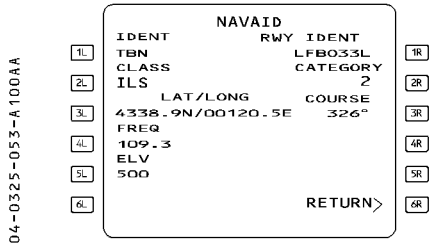
- The pilot calls up this page by pressing the 5R key on the STORED WAYPOINT page.
- The pilot can use this page to define and store up to 20 waypoints. Entering an additional waypoint deletes the first one.
  The pilot defines a waypoint by entering its ident in the data field next to 1L, then by entering its position in the amber boxes.
  The STORE prompt appears next to 6R when the boxes are filled in, and the pilot presses the key to store the waypoint in the database.
  If the pilot enters the waypoint's position as place/bearing/distance, or place-bearing/place-bearing, the FMGC computes its latitude and longitude.

NAVAID/STORED NAVAID/NEW NAVAID PAGES

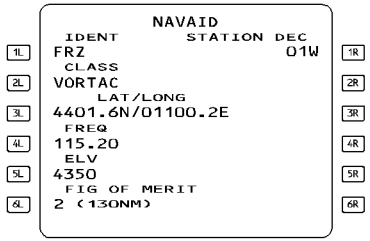


NAVAID PAGE

The pilot calls up this page by pressing the 2L key on the DATA INDEX page 2.
This page displays navaid information associated with the identifier the pilot inserts in the [1L] field.



NAVAID PAGE
(ILS)



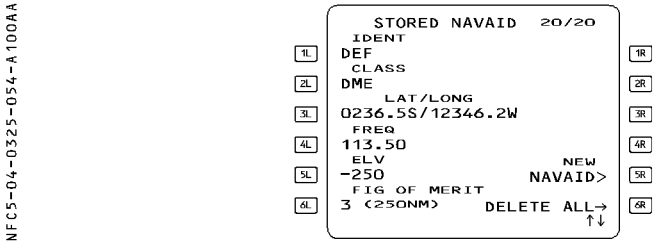
NAVAID PAGE (VOR TAC)

NFCS-04-0325-053-A100AA

[2L] CLASS	This field identifies the navaid as VOR, DME, VOR DME, VORTAC, NDB, LOC, ILS, MLS, ILS/DME, MLS/DME, ILS/TAC or TACAN. It displays NON COLLOCATED, if the navaid is uncollocated.
[4L] FREQ or CHAN	CHAN is displayed, if the class of navaid is an MLS or an MLS DME.
[5L] ELV	This field gives the navaid elevation in feet above sea level. It is not displayed for VOR or NDB.
[6L] FIG OF MERIT	This field shows how far out the FMGS can autotune a VOR, VOR/DME, VORTAC, or DME for display or for computing position. 0 : up to 40 NM 1 : up to 70 NM 2 : up to 130 NM 3 : up to 250 NM
[1R] STATION DEC or RWY IDENT	This is the magnetic declination in the navaid area (used only for VOR, VOR/DME, and VORTAC). The field displays RWY IDENT, if the navaid is a LOC, ILS, MLS, ILS/DME, MLS/DME or ILS/TAC.
[2R] CATEGORY	This field shows the navaid's category, if it is an ILS, ILS/DME, MLS, MLS/DME or ILS/TAC. A LOC DME has a category = 0.
[3R] COURSE	This is the localizer course, if the navaid is an ILS or a LOC.
[6R] RETURN	This prompt is displayed, if the page has been accessed from the SELECTED NAVAID page. The pilot presses this key to return to the SELECTED NAVAID page.

STORED NAVAID PAGE

The pilot calls up this page by pressing the 2R key on the DATA INDEX page. This page is used to display or delete defined and stored navaids.



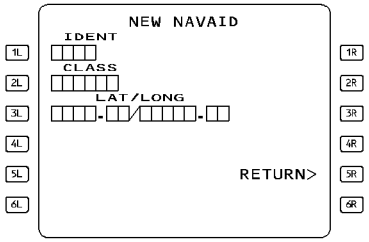
A number in the upper righthand corner of the screen shows the relative order in which the navaids were stored. (For example, 3/7 means the third out of the seven stored).
Slew keys give the pilot access to the different stored navaids.

[1L] IDENT — The pilot deletes a stored navaid by entering its ident in this field, then by pressing the CLR key at the bottom of the MCDU control panel.

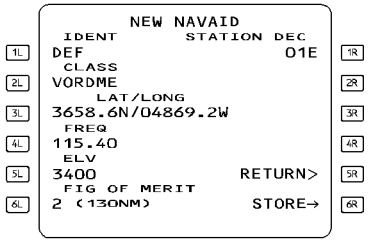
[6R] DELETE ALL and CONFIRM DELETE ALL — The pilot presses this key to erase all the stored navaids, except those currently used in the active or secondary flight plan. (The MCDU displays "F-PLN ELEMENT RETAINED.").

NEW NAVAID PAGE

The pilot calls up this page by pressing the 5R key on the STORED NAVAID page.



EMPTY NEW NAVAID PAGE



NEW NAVAID PAGE
(VOR/DME)

NFCS-04-0325-055-A100AA

It can be used to define and store up to 20 navaids. Entering an additional waypoint deletes the first one. The navaid elements must be entered in two steps :

1. Enter the data in the lines of amber boxes.
2. Enter frequency, elevation, figure of merit, and station declination or ILS category and course, if applicable.

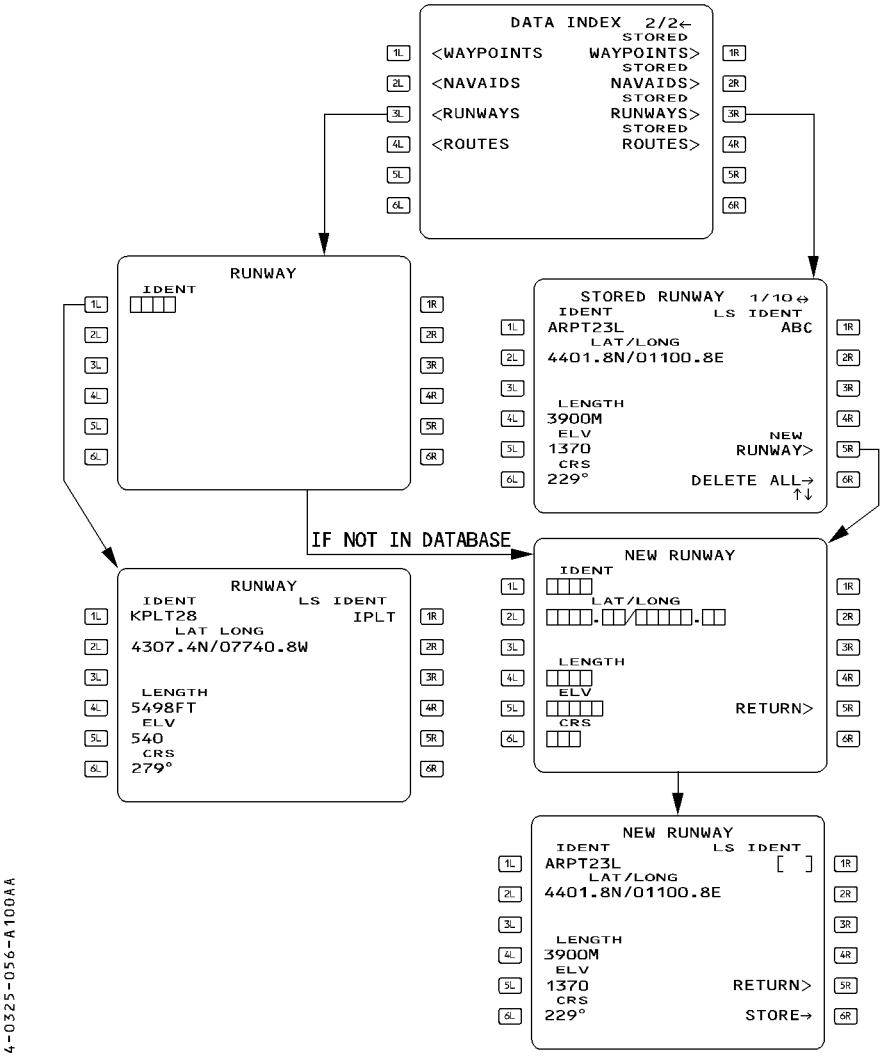
Note : The pilot cannot create an ILS/DME or an uncollocated navaid.
If the runway associated with the ILS has been entered through the new runway page, the course, ident, and runway ident are already displayed on the new navaid page when it comes up (copied from the new runway page). For details, see the new runway page info below.

[1R] STATION DEC	The pilot must enter the magnetic declination, if the prompt is displayed. This prompt is displayed only for VOR, VORTAC or VOR/DME.
[3R] COURSE	If the navaid is an ILS, LOC, enter the course.
[6R] STORE	This prompt appears when all the amber boxes are filled in. The pilot presses the key to store the navaid.

A stored navaid is never used for position computation.

RUNWAYS/STORED RUNWAYS/NEW RUNWAY PAGES

R



NFC5-04-0325-056-A100AA

NEW RUNWAY PAGE
(MANUALLY COMPLETED)

RUNWAY PAGE

This page displays the following information :

[1L] IDENT	The runway ident, which comprises the airport identification and the runway direction, uses six or seven digits (Example : CYYZ 24L and LFRJ 08).
[2L] LAT/LONG	The latitude and longitude of the runway threshold.
[4L] LENGTH	The runway length in meters (M) or feet (ft), in five digits (9999 ft).
[5L] ELV	The elevation of the threshold in feet above sea level.
[6L] CRS	The runway course (degrees magnetic).
[1R] LS IDENT	The LOC, ILS or MLS identifier.

STORED RUNWAY PAGE

The pilot uses this page to display or delete the defined and stored runways. The stored runways are listed and numbered in the order in which they were inserted. The number is displayed in the upper righthand corner of the page. (For example, 2/4 means the runway is the second of the four stored runways).
The pilot can delete any stored runway from the database by displaying its ident in the 1L field, then by pressing the CLR key on the MCDU control panel.

[6R] DELETE ALL and CONFIRM DELETE ALL	The pilot presses this key to erase all the stored runways, except those used in the active or secondary flight plan. (The MCDU displays "F-PLN ELEMENT RETAINED").
[1L] to [6L]	These fields are similar to the RUNWAY page fields.

NEW RUNWAY PAGE

The pilot can use this page to define and store up to 10 runways.
When the pilot enters an ILS/LOC ident in the [1R] field, the new navaid page comes up. When the pilot has entered and stored the necessary data in the new navaid page, the new runway page reappears.
The new runway page and the new navaid page (ILS/LOC) are not independent :

- When the flight crew first defines the ILS/LOC (on the new navaid page), the new runway page, when called up, already displays the RWY course, RWY ident, and ILS ident (copied from the new navaid page).
- When the flight crew first defines the runway (on the new runway page), the new navaid page, when called up, already displays the ILS course, ILS ident, and runway ident.

The pilot must enter the two runway directions on two different new runway pages (Example : LFRJ 08 and LFRJ 26) to allow the flight plan to select either one.

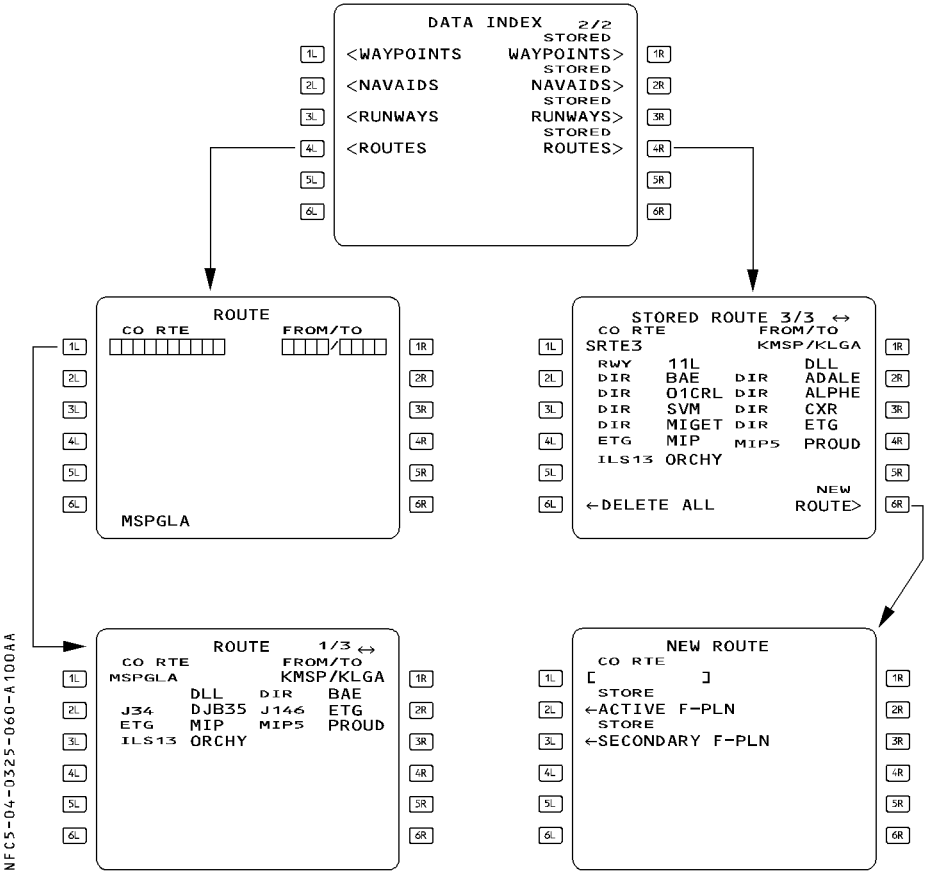
Note : When 10 runways are stored, entering a new stored runway deletes the first one of the list (1/10).

[1L] to [6L]	Enter information about the new runway.
[1R] LS IDENT	Enter the ILS/MLS/LOC ident. The NEW NAVAID page comes up.
[5R] RETURN	The pilot presses this key to return to the NEW NAVAID page.
[6R] STORE	This prompt only appears when all the amber boxes have been filled in.

R *Note :* — *The NEW RUNWAY may be used for departure or destination, but no SID or STAR can be associated or stored with this runway. Therefore, the pilot will use it as an "independent" airport.*
A new runway is identified by the 4–letter ICAO airport identifier, although all six or seven digits must be entered.

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ROUTE/STORED ROUTE/NEW ROUTE PAGES



ROUTE PAGES

(Not-modifiable)

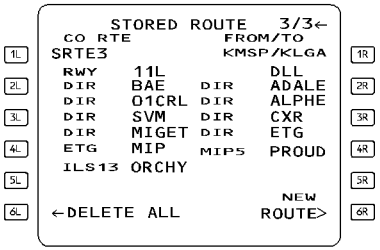
[1L] CO RTE — Any company route ident, entered in this field, causes all the elements of the route to be displayed.

Line 2 to Line 6 — These lines display the various route elements, including waypoints and airways.

[1R] FROM/TO — This field is automatically filled in, when the pilot enters the ident for a company route. When the pilot manually enters a city pair, the MCDU displays "NOT IN DATA BASE" if the city pair is not in the navigation database. If the city pair is in the database, the CO RTE field displays the first route stored (small blue font). If more than one route is stored, the pilot can slew to see the different routes.

STORED ROUTE PAGE

NFCS-04-0325-061-A100AA



This page displays up to 5 routes, stored by the pilot. The stored routes are listed and numbered in the order of insertion. The number is displayed in the upper right-hand corner of the page.

[1L] CO RTE — This field identifies the stored route. Clearing this field deletes the stored route.

Line 2 to Line 5 — The fields in these lines are identical to the corresponding fields in the route page.

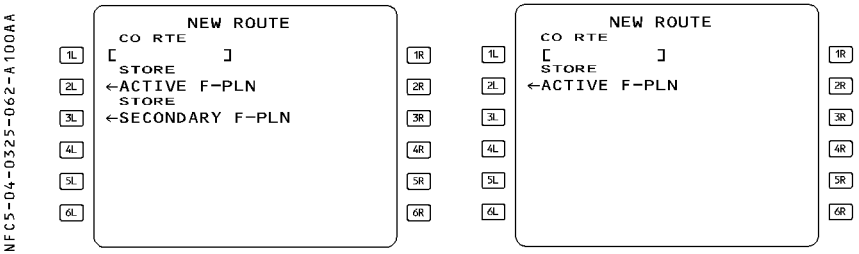
[6L] DELETE ALL — Pressing this key changes the label to amber CONFIRM DELETE ALL. Pressing this key a second time deletes all previously-stored routes.

[1R] FROM/TO — This identifies the city pair of the stored route.

[6R] NEW ROUTE — Pressing this key calls up the new route page.

NEW ROUTE PAGE

The pilot calls up this page by pressing the NEW ROUTE key on the stored route page. It can be used to store up to five new routes that have already been defined in the active or secondary flight plan.



[1L] CO RTE — This field enables the pilot to enter a new company route ident. If that ident has already been assigned, the entry is rejected.

[2L] STORE ACTIVE F-PLN (blue)
Pressing this key stores parameters of the active flight plan as new route.
The display shows this prompt when the system contains a FROM/TO, but only during preflight.

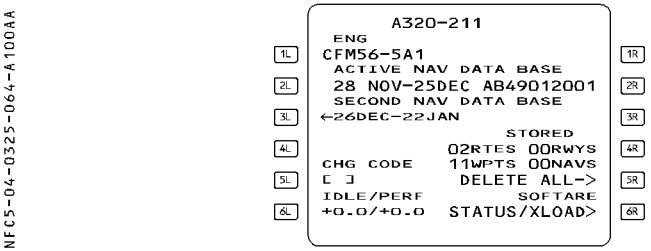
[3L] STORE SECONDARY F-PLN (blue)
Pressing this key stores parameters of the secondary flight plan as new route. The display shows this prompt when the system contains a FROM/TO and the secondary flight plan has not yet been sequenced.

Note :
- *If it has not already been named, a stored route is automatically named when stored : SRTE 1 to SRTE 5.*
- *When 5 routes are already stored, the pilot cannot insert a new stored route. The "STORED ROUTE FULL" message is displayed, and the pilot must manually delete a route in order to store a new one.*
- *Several flight plan elements are not retained when the route is stored :*
  - *Pilot-entered holds*
  - *Offset*
  - *Pilot-entered constraints*
  - *Modifications to terminal procedures*
  - *Pseudo-waypoints*
  - *Step at optimum.*
  - *Pilot-entered constant Mach segment.*
    The MCDU then displays "REVISIONS NOT STORED".

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AIRCRAFT STATUS PAGE

The system automatically displays this page at power up, but the pilot may also call it up by pressing the DATA key on the MCDU console.



TITLE — AIRCRAFT TYPE

[1L] ENGINE TYPE — The system uses this to calculate predictions.

R *Note : When the same performance database is used for various aircraft configurations,*
R *the aircraft type displayed may differ from the actual aircraft.*

[2L] ACTIVE DATABASE — The validity period and part number are displayed in large font.

[3L] SECOND DATABASE — The validity period is displayed in small font. The pilot can press the 3L key to switch to the second database as the active database.

CAUTION

Cycling the database erases the primary and secondary flight plans, as well as the stored data. The flight crew must never do this in flight.

[5L] CHG CODE — This field allows the entry of a code to change the IDLE and/or PERF factor, displayed in 6L. It is displayed in the PREFLIGHT and DONE phases. The label is displayed in small white font. The brackets, or the entered value, is displayed in large blue font.

[6L] IDLE/PERF — These factors can only be modified while the aircraft is on ground. If no value has been entered, the databases default value is displayed in small font. Some aircraft require that the IDLE/PERF factor be adjusted. To do so, the crew may use the following procedure :

- Enter "ARM" in the CHG CODE line's [5L] brackets.
- Write the new IDLE/PERF factor in the scratchpad.
- Enter this new factor in line [6L].
  The entered factor is displayed in large green font. The airline may change the ARM code.

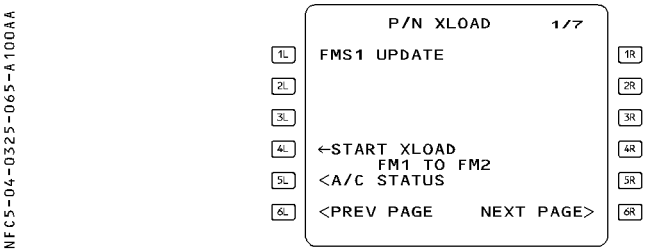
[4R] STORED — This field displays pilot-stored data in a large green font. The field is blank, if no data is stored. (The airline can choose to have this data automatically erased at the done phase).

[5R] DELETE ALL — Pressing this key changes the label to amber CONFIRM DELETE ALL. Pressing this key a second time deletes all pilot-stored data, except data that is part of the active and secondary flight plans.

[6R] STATUS/XLOAD — This prompt gives access to the P/N STATUS and P/N XLOAD pages.

P/N XLOAD PAGE

This page allows the crossloading of all databases or configuration files' part numbers which are different between both sides. Crossloading from this page avoids reviewing each individual P/N STATUS page.



TITLE — P/N XLOAD

[1L] — FMS1 UPDATE : FMS1 can be loaded on the right side MCDU.
FMS2 UPDATE : FMS2 can be loaded on the left side MCDU

[4L] — START XLOAD : This blue prompt is displayed, only if the system detects a difference between both sides' part numbers.
FMS1/FMS2 IDENTICAL : Displayed in green, when there is no difference between both sides' part numbers.

Line 5 — FM1 TO FM2 or FM2 TO FM1 : Indicates the crossloading direction. This line is not displayed when there is no difference between both side part numbers.

[5L] — A/C STATUS : This white prompt is displayed, when there is no crossloading in process. It gives access to the A/C STATUS page.
MM : SS MIN REMAINING : Indicates the time remaining for crossload completion, when a crossload is in process.

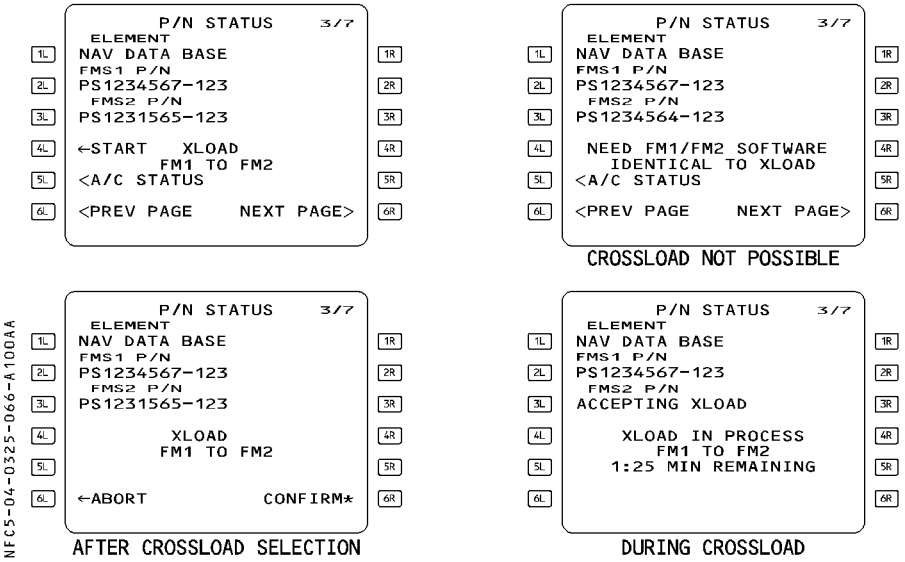
[6L] PREV PAGE — The pilot presses this key to return to the A/C STATUS page.

[6R] NEXT PAGE — Pressing this key calls up the next P/N XLOAD page.

P/N STATUS PAGES

These pages allow reviewing and crossloading the following databases and configuration files between both FMS :

— Page 2 FMS SOFTWARE part numbers
— Page 3 NAV DATA BASE part numbers
— Page 4 FM AIRLINE CONFIG part numbers
— Page 5 FM OPTIONS CONFIG part numbers
— Page 6 PERF DATA BASE part numbers
— Page 7 FLIGHT TEST DATA BASE



TITLE
P/N STATUS

Line 1 ELEMENT
Indicates the name of the database or configuration file that can be crossloaded :

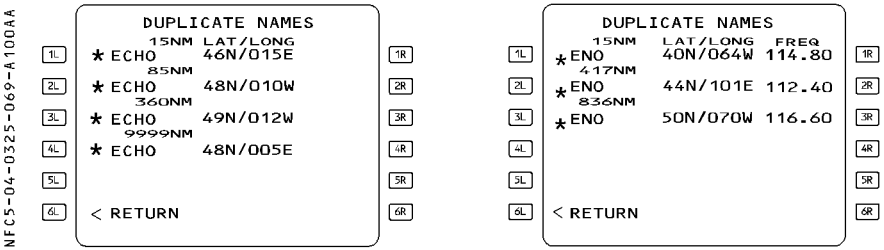
— FMS SOFTWARE on Page 2
— NAV DATA BASE on Page 3
— FM AIRLINE CONFIG on Page 4
— FM OPTIONS CONFIG on Page 5
— PERF DATA BASE on Page 6
— FLIGHT TEST DATABASE on Page 7.

Line 2 FMS1 P/N Line 3 FMS2 P/N	These fields display the part numbers of the database or configuration file (stated on line 1), that are installed on the FMS 1 and 2. Identical part numbers are displayed in green, different ones in amber. During crossload, the updated part number is replaced by the amber "ACCEPTING XLOAD" message.
Line 4	This line is empty when the active flight phase is not Preflight or Done. XLOAD FMx TO FMy or START XLOAD FMx TO FMy : This blue prompt is displayed when the database or configuration file (stated on line 1) can be crossloaded. XLOAD ARMED : Displayed in blue on the receiving FM when the crossload has been requested, but not yet confirmed. XLOAD IN PROCESS : Displayed in white when the crossload is ongoing. XLOAD NOT SUPPORTED : Crossloading is unavailable for this element. NO P/N TO XLOAD : The element is missing. NEED FG1/FG2 IDENTICAL TO XLOAD : The receiving side's FG software is incompatible with the FG software to be crossloaded. NEED FM1/FM2 SOFTWARE IDENTICAL TO XLOAD : The crossloaded element is incompatible with the receiving side's FM software.
[5L] A/C STATUS	This prompt is available, when no crossload is in process. This gives the pilot access to the aircraft status page. MM : SS MIN REMAINING : Displays the time remaining to complete the crossload, when a crossload is in process.
[6L] PREV PAGE	This key calls up the previous P/N STATUS page.
ABORT	This amber prompt is displayed when a crossload is in process. The pilot uses it to stop the crossload.
[6R] NEXT PAGE	This key calls up the next P/N STATUS page.
CONFIRM*	This amber prompt is displayed when a crossload has been armed. The pilot presses it to start the crossload.

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DUPLICATE NAMES PAGE

This page, which automatically appears, allows the pilot to select a specific waypoint, airport, or navaid when the database holds more than one under the same identifier.



The pilot presses the key adjacent to a waypoint, navaid, or airport to select it as the one to be entered. When the pilot has finished, the page automatically reverts to the previously displayed page.

Distance

The direct distance to the aircraft is displayed in green above each name. If this distance is greater than 9999 NM, 9999 NM is displayed.

LAT/LONG column

This column lists the rounded off latitudes and longitudes of the different points, using the same identifier.

FREQ/CHAN column

This column lists the navaids frequencies, if any. It displays CHAN for a MLS.

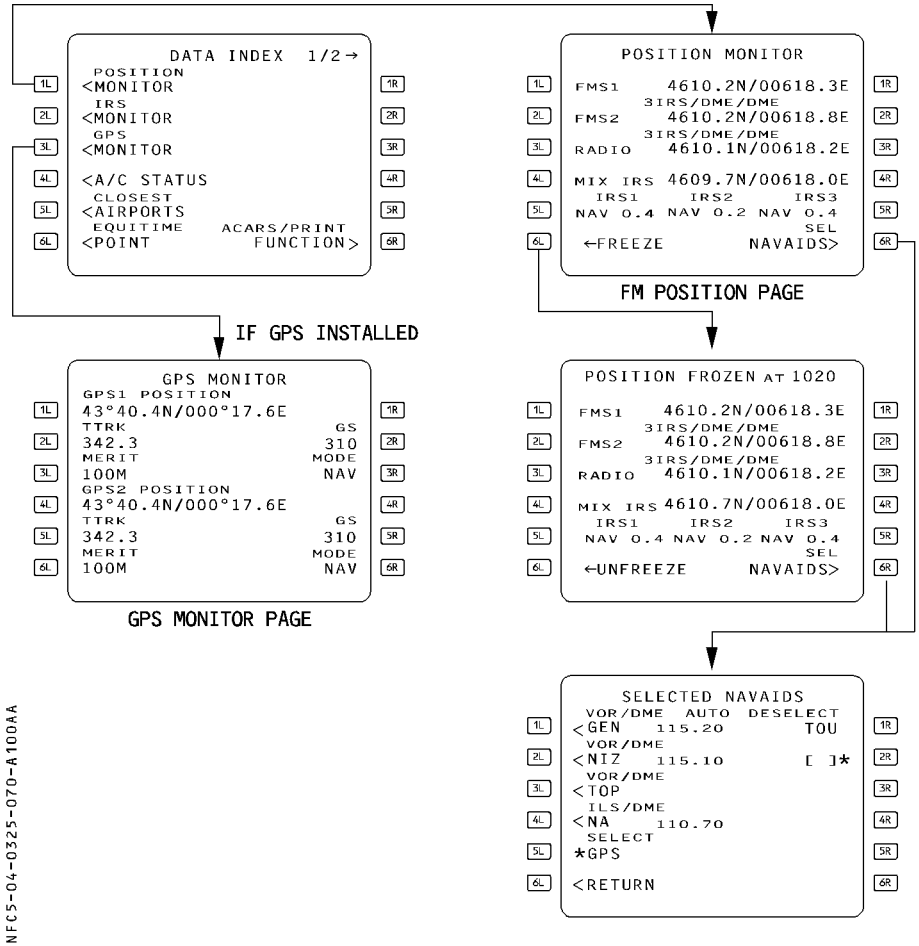
Note : · *The DUPLICATE NAMES page is not displayed when 2 waypoints with the same ident belong to the same airway. The system selects the first waypoint found in the database.*

· *The waypoints or navaids are ranked by their distance from the aircraft position.*

· *When a waypoint is named using ICAO phonetic alpha characters, a minus sign and the ICAO code of the country where the waypoint is located, are displayed. e.g. Alpha in France becomes A-LF ; Bravo in England becomes B-EG.*

POSITION MONITOR PAGE

This page displays all the different positions that the FMGC has computed with the various available methods of navigation. It also shows which method obtained each position. (The positions should be almost identical).
The pilot calls up this page by pressing the 1L key on the data index page.



NFCS-04-0325-070-A100AA

POSITION MONITOR AND POSITION FROZEN PAGE

Line 1 FMS 1	This line shows the latitude and longitude, as calculated by the onside FMGC, and the navigation method used by the FMGC for that calculation (Example : "3IRS/DME/DME").
Line 2 FMS 2	This line shows the latitude and longitude, as calculated by the opposite FMGC, and the navigation method used.
Line 3 RADIO or GPS or GPIRS	This line shows the latitude and longitude, calculated by the onside FMGC from selected radio navaids (Example : DME/DME, VOR/DME, or LOC) or from GPS or GPIRS.
Line 4 MIX IRS	This line shows the latitude and longitude of the weighted mean inertial reference system (IRS) calculated by the onside FMGC from the available IRSs.
Line 5 IRS 1,2,3	This line shows the deviation in nautical miles of each IRS position from the onside FMGC position. It also displays the IRS mode, which can be INVAL, ALIGN, NAV or ATT. *Note : INVAL is displayed when an ADIRS has failed, or the IRS position is not refreshed.*
[6L] FREEZE/UNFREEZE	The pilot presses this key to freeze (or unfreeze) all the data displayed on the page. When the data is frozen, the title of the page specifies the time at which it was frozen.
[6R] SEL NAVAIDS	The pilot presses this key to access the selected navaids page.

SELECTED NAVAIDS PAGE

MODIFIABLE ONLY FOR DESELECTION

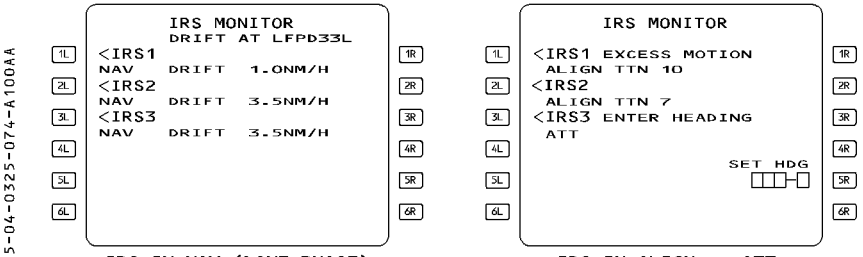
Line 1	This field displays the navaid tuned for display purposes, and the tuning mode (AUTO, MAN, or RMP).
Line 2 and 3	These fields display the navaids, if any, tuned for the calculation of radio position by the FMGEC.
[4L]	This field displays the tuned ILS (or MLS), if any.
[5L] DESELECT/SELECT GPS	The crew presses this key to manually select or deselect the GPS for position computation. Upon transition to the DONE phase, the prompt returns to DESELECT status. If the pilot deselects the GPS, "GPS IS DESELECTED" is displayed when the aircraft is less than 80 NM from the top of descent, or in approach phase.

[6L] RETURN	The pilot presses this key to return to the POSITION MONITOR page.
[1R] DESELECT to [6R]	The pilot deselects a navaid by entering its identifier in one of these six fields. Once deselected in this way, the navaid can no longer be tuned manually through the entry of its ident, nor can it be autotuned for display or determination of the position for the rest of the flight. The deselection is cleared : – manually, by a CLR action into this field, or – automatically upon transition to the done or preflight phase, or upon activation of the second database. The pilot may deselect as many as six stations.

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IRS MONITOR PAGE

This page displays the IRS data. The crew calls up this page by pressing the IRS monitor prompt of the DATA INDEX page.

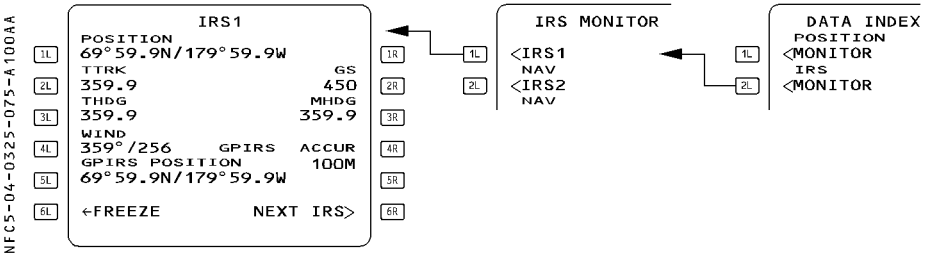


IRS IN NAV (DONE PHASE) — IRS IN ALIGN or ATT

TITLE DRIFT AT XXXX (amber)	Displays "DRIFT AT" runway identifier, if at least one IRS average drift is displayed.
[1L] to [3L] IRS 1(2) (3) (white)	These prompts allow access to the associated IRS pages. Each label line displays the mode (NAV, ALIGN, ATT or INVAL), the average drift (upon transition to DONE phase), and the Time To Nav (if IRS in align) for each IRS.
[1R] to [3R]	Displays the status message of the associated IRS in small green font. List of available messages : IR FAULT — CHECK C/B DELAYED MAINT — CDU FAULT ENTER PPOS — ENTER HEADING SELECT ATT — REENTER PPOS EXCESS MOTION — SYS BELOW – 15° SWITCH ADR
[5R] SET HDG (white)	This field is displayed, if at least one IRS is in ATT mode. This function allows initialization of a heading for IRS in ATT mode. · If a heading has been entered in this field, or on the ADIRS panel, the value is displayed in blue. · If not, amber boxes are displayed.

IRS 1 (2)(3) PAGE

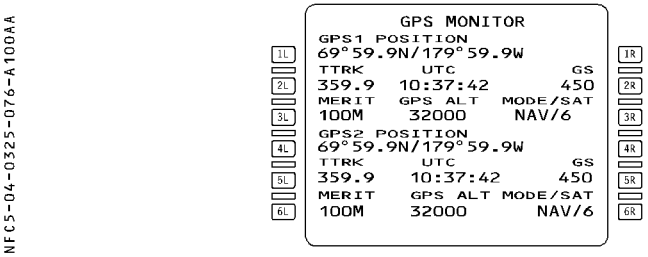
This page displays the IRS parameters and GPS/IRS hybrid parameters. The pilot calls up this page by pressing either the 1L key from the IRS MONITOR page, or the NEXT IRS prompt on another IRS page (closed loop).



TITLE	Displays the selected IRS in large white font. When data is frozen, IRS is replaced by "IRS FROZEN AT", followed by the time at which the pilot has frozen the display.
[1L] POSITION	Displays the latitude/longitude given by the selected IRS.
[2L] TTRK	True track
[3L] THDG	True heading
[4L] WIND	True wind direction/velocity
[5L] GPIRS	GPS/IRS hybrid position of the IRS
[6L] FREEZE/UNFREEZE	Allows the crew to freeze or unfreeze all data displayed on all three IRS pages. When the data is frozen, the title of the page specifies the time at which it was frozen. It is automatically unfrozen when exiting the page.
[2R] GS	Ground speed
[3R] MHDG	Magnetic heading
[4R] GPIRS ACCUR	GPS/IRS Figure of Merit (meters or feet)
[6R] NEXT IRS	This prompt enables another IRS page (closed loop IRS 1 → 2 → 3 → 1) to be displayed.

GPS MONITOR PAGE

This page displays the GPS data. The pilot calls up this page by pressing the GPS MONITOR prompt of the DATA INDEX page.

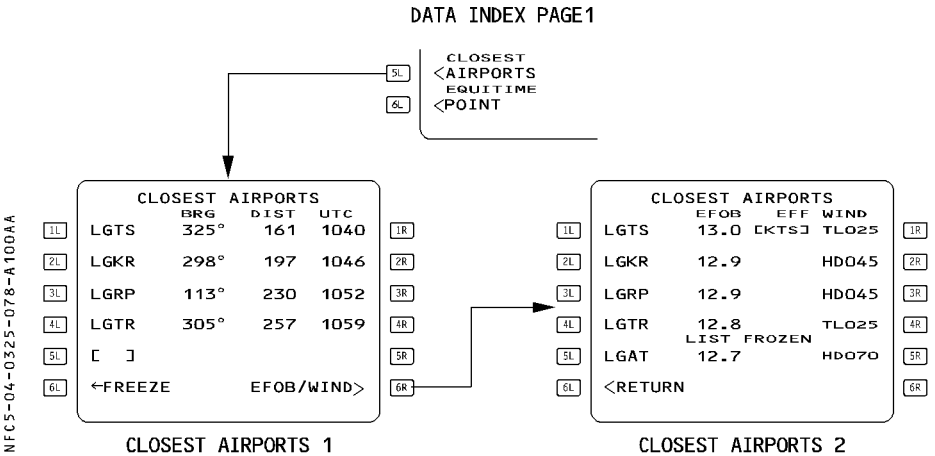


Line 1 and 4 GPS 1,2	POSITION
[2L] and [5L] TTRK	GPS 1, 2 true track
[3L] and [6L] MERIT	GPS 1, 2 figure of merit (meters or feet)
[2R] and [5R] GS	GPS 1, 2 ground speed
[3R] and [6R] MODE/SAT	GPS 1, 2 mode (INIT, ACQ, NAV, TEST, FAULT, AIDED or ALTAID) and Number of satellites tracked. INIT : System initialization ACQ : Satellite acquisition NAV : Normal mode TEST : System test FAULT : Invalid system ALTAID/ : AIDED : Degraded modes. GPS uses aircraft inputs for computation purposes.
[2] and [5] UTC	: GPS 1, 2 UTC
[3] and [6] GPS ALT	: GPS altitude is displayed for information purposes. It is not used by the FMGS.

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CLOSEST AIRPORTS PAGES

The system automatically selects the closest 4 airports from the current aircraft position, and displays them on these pages. A fifth one can be selected by the pilot.
Page 1 displays the bearing, distance, and time to go to each airport ; page 2 displays the EFOB and allows the crew to enter an effective wind to be flown to each airport.
The flight crew accesses the CLOSEST AIRPORTS page 1 by pressing the 5L key from the DATA INDEX A page. They access the CLOSEST AIRPORTS page 2 by pressing the EFOB/WIND prompt (6R key) on page 1.



[1L] - [1R] to [4L] - [4R]
The closest four airports are extracted from the database, and ranked by distance from the aircraft position.

- BRG — Displays the current bearing from the aircraft's position to the airport.
- DIST — Displays the current great-circle distance from the aircraft's position to the airport.
- TIME or UTC — Displays the predicted time to the airport, computed using the current wind or a wind vector entered on page 2, and the speed according to the current mode (managed or selected).
  The time is only computed in cruise phase.

[5L]
The crew may enter a fifth airport here, using the 4–letter code. The entry may be modified at any time, even when "LIST FROZEN" is displayed.

If the pilot enters an airport that is not in the database, then "NOT IN DATABASE" appears in the scratchpad.

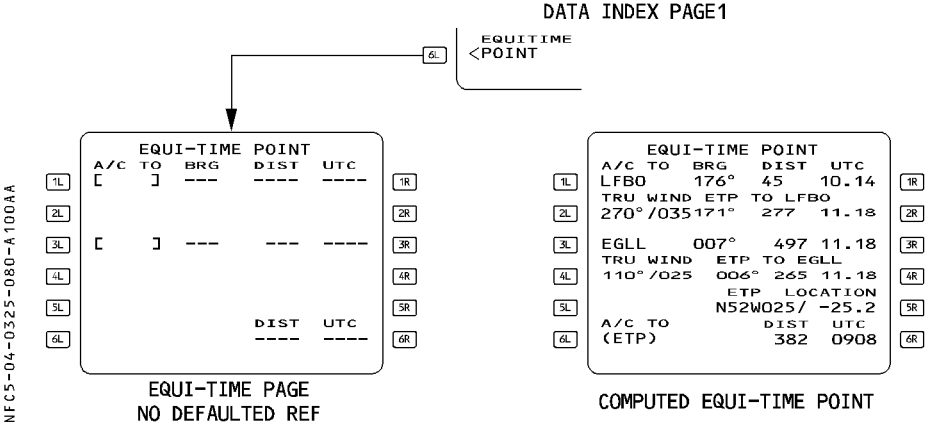
[1L] - [1R] EFOB to [5L] - [5R] EFF WIND	Displays the EFOB at each airport. EFOB is only computed in cruise phase. Used to enter an anticipated headwind or tailwind along the bearing to the airport. If the entry is preceded by +, T, or TL, a tailwind is assumed. If the entry is preceded by –, H, or HD, a headwind is assumed. Before pilot entry, a default value may be displayed, based on the current wind. The effective wind is used to compute the EFOB and time to the airport.
[6L] FREEZE/UNFREEZE	This prompt enables the pilot to freeze and unfreeze the list of four airports. The list is automatically frozen when accessing page 2. It will remain frozen upon returning to page 1. The "LIST FROZEN" message is always displayed on page 2.
RETURN	Returns to page 1.
[6R] EFOB/WIND	Gives access to page 2. Pressing this prompt automatically freezes the list of the four closest airports.

Note : – *If the aircraft position becomes invalid, all fields are dashed, FREEZE/UNFREEZE and EFOB/WIND prompts are removed, LIST FROZEN is displayed, and the A/C POSITION INVALID message is displayed in the scratchpad. Page 2 cannot be accessed.*

– *Predictions (EFOB, TIME) displayed on the page assume :*
- *ECON CRZ speed (managed) or current selected speed (selected) ;*
- *CI (for managed speed only) and CRZ FL from primary F-PLN are kept*
- *constant wind value ;*
- *In case of engine out, the aircraft altitude is the minimum of (CRZ FL, EO MAX ALT) ;*
- *Downpath steps are not considered ;*
- *Descent fuel burn is a conservative value which only depends on the difference between current CRZ ALT and destination altitude.*

EQUI-TIME POINT PAGE

The pilot uses this page to require an equitime point computation between two different points (airport, navaid, runway, NDB or waypoint). This pseudo-waypoint (ETP) is displayed on the navigation display along the F-PLN. The EQUI-TIME POINT page is accessed by pressing the 6L key from the DATA INDEX page :



[1L] A/C TO and (blue) [3L] Displays reference waypoint 1.
Displays reference waypoint 2.

Note : Origin and destination airports are used by default for respective reference points 1 and 2, until a pilot entry is made.

[1R] BRG/DIST/UTC and (TIME)
This field displays the bearing, distance, time, from the aircrafts' current position to the reference waypoint 1.
Idem for the reference waypoint 2.

[3R] (green)
BRG : Displays the current great-circle bearing from the aircraft's position to the reference waypoint.
DIST : Displays the current great-circle distance from the aircraft's position to the reference waypoint.
TIME : Displays the predicted time to the reference waypoint (computed using the current wind or a wind vector, entered by the crew).
Time is only computed in the cruise phase. In other cases, it is dashed.

[2L] and [4L] TRU WIND and (blue)

The pilot may enter the wind (direction/velocity) at the reference waypoint and the CRZ FL :
This wind is used to compute the time from the aircraft's position to the reference waypoint, and to locate the equitime point.
If no entry is made, the wind/velocity field will read zero.

[2R] and [4R] EPT TO XXX and (green)

This field displays the bearing distance and the time from the equitime point position (ETP) to the reference waypoint.

[5R] ETP LOCATION

This field displays the ident of the next waypoint following the equitime point. It provides the distance along the flight plan from the equitime point to the indicated waypoint.

[6L] - [6R] A/C TO (ETP) DIST/UTC (green)

This field displays the distance and time from the aircraft's current position to the equitime point along the flight plan.
If at least one reference waypoint exists, but no equitime point exists, the field is blank and NO ETP is displayed in 6L.

Note : The assumptions for the equitime point computation include the cost index, speed managed (with SPD LIM), and winds.
In case of engine-out, the EO LRC speed is considered.

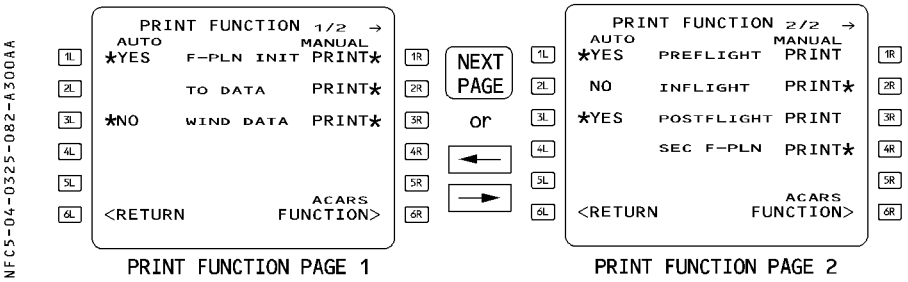
PRINT FUNCTION PAGES

The PRINT FUNCTION pages enable the crew to print the data relative to the current flight. This data comes from 2 different sources :

– ACARS uplink messages, and

– Active data from the current flight.

The pilot may access these pages from the "DATA INDEX" page1/2 by pressing the [6R] ACARS/PRINT FUNCTION key.



PRINT FUNCTION PAGE 1 PRINT FUNCTION PAGE 2

PRINT FUNCTION PAGE 1/2

This page displays the status of the automatic printing capabilities, for the uplink messages (left column), and the status of the manual printing capabilities of the current active data (right column).

Left column

AUTO

* YES (blue)	Line 1 : Uplink messages related to flight plan INIT data are automatically printed when received. Line 2 : Uplink messages related to takeoff data are automatically printed when received. Line 3 : Uplink messages related to wind data are automatically printed when received.
* NO (blue)	When "NO", preceded by a star, is displayed in front of a line, automatic printing is deselected. The pilot can reactivate it by pressing the left key of the line.
NO (without a star)	Automatic printing is internally deactivated for the data of the line. The pilot cannot reactivate it manually.
Blank	The ACARS function is not available for this line. Uplink messages can neither be received nor automatically printed.

Right Column

MANUAL — Displays the status of the manual printing capability of the active data (and not of the ACARS uplink data).

PRINT * (amber) — Pressing the right keys prints the following active data :
- Line 1 : Active flight plan init data
- Line 2 : Active takeoff data
- Line 3 : Active wind data

If the star is not displayed, printing is not possible.
When the key is pressed, the star is removed until the data is printed.

[6L] RETURN — Pressing this key reverts the display to the DATA INDEX page.

[6R] ACARS FUNCTION — Pressing this key reverts the display to the ACARS FUNCTION page.

PRINT FUNCTION PAGE 2/2

This page describes the printing capabilities of the reports displayed on lines 1 to 4.

Left column

AUTO (white)

* YES (blue) —
- Line 1 : The PREFLIGHT report is automatically printed at engine start.
- Line 2 : The INFLIGHT report is automatically printed at takeoff.
- Line 3 : The POSTFLIGHT report is automatically printed at engine shutdown.

* NO (blue) — The report, displayed on the line, is not printed automatically. The pilot can reactivate the function by pressing the left key of the line.

NO (without a star) — Automatic printing is internally deactivated for the report. The pilot cannot reactivate it.

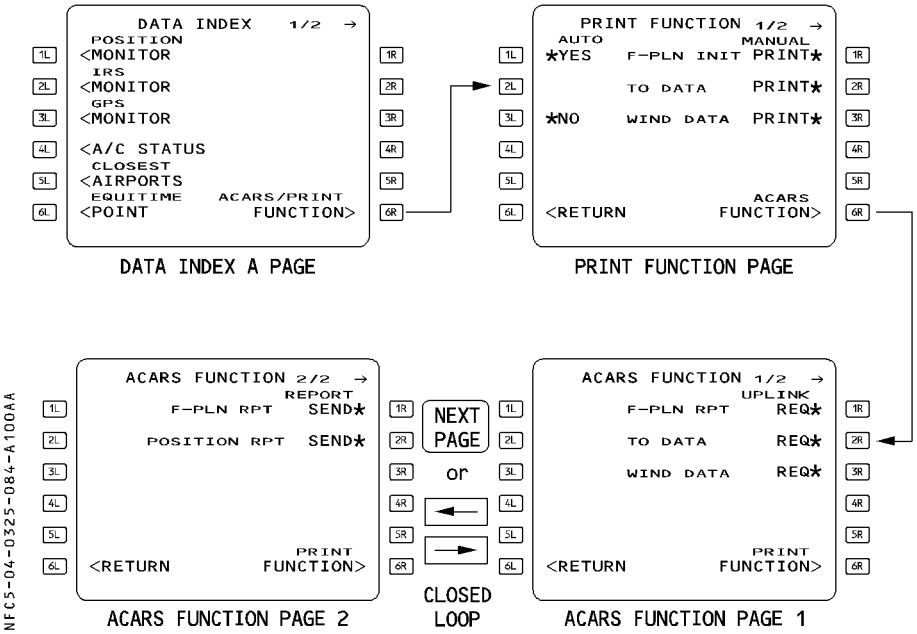
Right column

MANUAL — Pressing a right key prints the report displayed on the line.

PRINT * — If the star is not displayed, printing is not possible.
When the key is pressed, the star is removed until the report is printed.
For the PREFLIGHT, INFLIGHT and POSTFLIGHT reports, only one type of report is available for printing at any given time, depending on the current flight phase.
For the SEC F-PLN report, the print selection start is only displayed if a secondary flight plan exists.

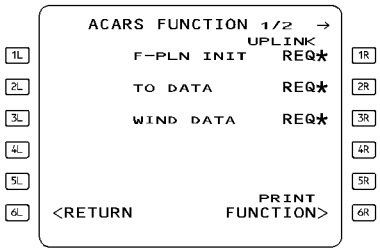
ACARS FUNCTION PAGE

The ACARS FUNCTION pages display the functions enabling the crew to send manual requests or reports to the ground.
All functions, displayed on pages 1 and 2, may be inhibited through a pin program.
The ACARS/PRINT FUNCTION prompt is displayed on the DATA INDEX page 1/2. Pressing this key displays the PRINT FUNCTION page from which the ACARS FUNCTION page can be accessed.



ACARS FUNCTION PAGE 1

NFC5-04-0325-085-A100AA



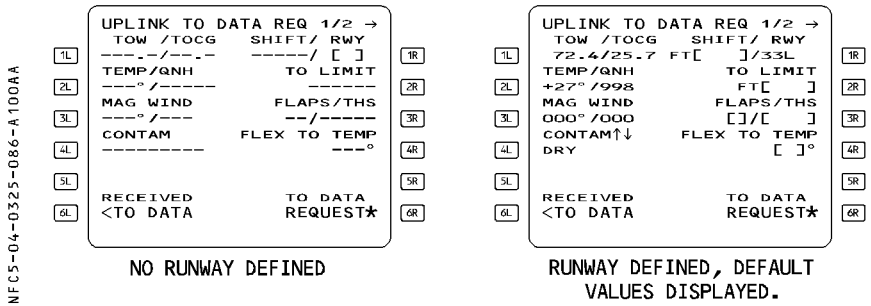
TITLE	ACARS FUNCTION 1/2 in white
Line 1 F-PLN INIT REQ*	Pressing this key sends a request for flight plan to the ground (downlink message) The INIT REQUEST prompt of the INIT A page provides the same function.
Line 2 TO DATA REQ*	Pressing this key sends a request for takeoff data. Displayed in the DONE and PREFLIGHT phases. The TO DATA REQUEST prompt of the UPLINK TO DATA REQ page provides the same function.
Line 3 WIND DATA REQ*	Pressing this key sends a request for wind data. The WIND REQUEST prompt of the CLIMB, CRUISE, and DESCENT WIND pages provides the same function.

Note : If "REQ" is not followed by a star, the request cannot be sent (downlink message).
When a function (line 1 or 2 or 3) is deactivated internally, the corresponding line is blank.

[6L] RETURN	The pilot presses this key to make the display revert to the DATA INDEX page.
[6R] PRINT FUNCTION	The pilot presses this key to access the PRINT FUNCTION page. (Refer to PRINT function page).

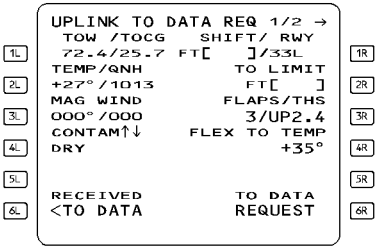
UPLINK TO DATA REQ PAGES

This page allows the pilot to send a request for takeoff data for up to 2 runways. There is one page for each runway. The page is accessed from the PERF TAKEOFF page, or from the UPLINK XXX (MAX or FLX) TO DATA page, by pressing the UPLINK TO DATA prompt.



TITLE	White.
[1L] TOW/TOCG (green)	This field is dashed, until a runway is defined in the [1R] field. The TOW/TOCG is defaulted to the values of the INIT B and FUEL PRED pages. If not available, dashes are displayed. It cannot be modified by the pilot.
[2L] TEMP/QNH or QFE (green/blue)	This field is dashed, until a runway is defined in the [1R] field; TEMP = Defaulted to SAT, and cannot be modified by the crew. BARO = Defaulted to FCU selection and can be modified by the pilot.
[3L] MAG WIND (blue)	This field is dashed, until a runway is defined in the [1R] field. It displays the wind at the origin. The pilot can modify this field.
[4L] CONTAM (blue)	This field is dashed, until a runway is defined in the [1R] field. The display is defaulted to DRY. The slew keys allow the crew to modify the runway contamination. DRY, WET, 1/4 WATER, 1/2 WATER, 1/4 SLUSH, 1/2 SLUSH, COMP SNOW.
[6L] RECEIVED TO DATA	This field calls up the UPLINK MAX (or FLX) TO DATA page that displays the data received by ACARS.

NFC5-04-0325-087-A100AA

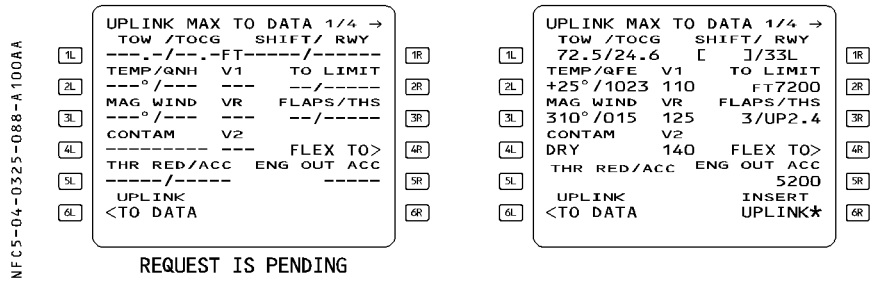


[1R] SHIFT/RWY (blue)	This field is dashed, until a runway is defined in the F-PLN. If a runway is defined in the F-PLN, it is automatically filled : SHIFT = Value from the PERF TO page, or blue bracket if no value is defined. RWY = F-PLN departure runway. The pilot can modify this field.
[2R] TO LIMIT (blue)	It is dashed, until a runway is defined in the [1R] field. It displays blue brackets [ ], when a runway is defined. The pilot may enter a length, considering runway obstacles.
[3R] FLAPS/THS (blue)	This field is dashed, until a runway is defined in the [1R] field ; it is then defaulted to values from the PERF TO page. Blue brackets are displayed, if the PERF TO page does not have any defined values.
[4R] FLEX TO TEMP (blue)	This field is dashed, until a runway is defined in the [1R] field ; it is then defaulted to values from the PERF TO page. Blue brackets are displayed, if the PERF TO page does not have any defined values. The pilot can modify this field and enter a FLEX TO temperature (FXX).
[6R] TO DATA REQUEST* (amber)	Pressing the key sends the takeoff data request message to the ground. The star disappears when the request is sent. It reappears when the data is available.

Page 2/2 is a page used for requesting a second runway data.

Note : — If the UPLINK TO DATA REQ Page 2 is accessed (Page 1 being filled), the fields of this page are filled with default values after entry of a runway in [1R]. QNH or QFE and wind are common with Page 1.

UPLINK MAX TO DATA PAGES



This page is accessed from the UPLINK TO DATA REQ page by pressing the RECEIVED TO DATA key.

There is a set of 2 pages (MAX TO DATA and FLEX TO DATA) for each of the 4 uplinked runway data. Uplinked data is displayed in green. (It cannot be modified by the pilot).

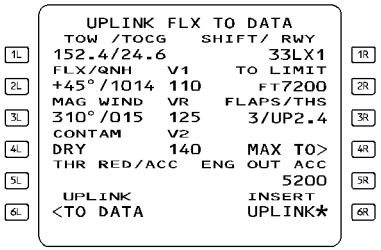
	[1L] TOW/TOCG	Uplinked reference Takeoff Gross Weight and Takeoff Center of Gravity.
	[2L] TEMP/QNH (or QFE)	Uplinked assumed temperature and baro setting.
	[3L] MAG WIND	Uplinked takeoff runway wind.
	[4L] CONTAM	Uplinked takeoff runway contamination.
	[5L] THR RED/ACC	Uplinked Thrust Reduction and Acceleration altitudes.
	[6L] UPLINK TO DATA	Pressing the key calls up the UPLINK TO DATA REQ page
	V1, VR, V2	Uplinked takeoff speeds.
	[1R] SHIFT/RWY	Uplinked TO runway ident, runway intersection and position shift.
	[2R] TO LIMIT	Uplinked runway length remaining.
	[3R] FLAPS/THS	Uplinked FLAPS/SLATS CONF and TRIM position.
	[4R] FLEX TO	Pressing this key calls up the UPLINK FLEX TO DATA pages.
R	[5R] ENG OUT ACC	Uplinked engine-out acceleration altitude.

[6R] INSERT UPLINK* Uplinked takeoff data is available for insertion.
Selecting this prompt inserts the following data on the PERF TO page :
– V1, VR, V2
– THR RED/ACC, ENG OUT ACC altitudes
– MAG WIND
– FLAPS/THS
– SHIFT
– FLEX
The display reverts to the PERF TO page, the asterisk disappears.
This field is not displayed, if the runway does not match the
R active runway, or if the uplinked TOW/TOWCG differs from the
R current TOW/TOWCG (if already exists). The "CHECK TAKE
R OFF DATA" message is displayed on the MCDU scratchpad.

Note : All previously-received data is replaced by the new uplinked data.

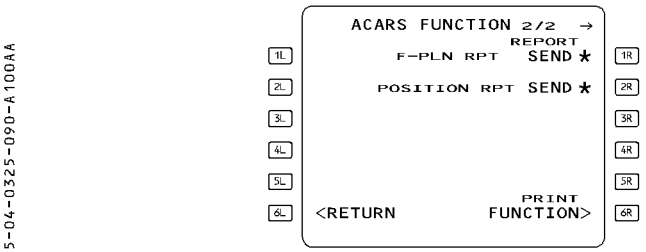
UPLINK FLX TO DATA PAGES

NFCS-04-0325-089-A100AA



TITLE UPLINK FLX TO DATA.
[2L] FLX/QNH (or QFE)
When the UPLINK FLEX TO DATA page is selected, it displays uplink assumed Flex Temperature and baro setting (QNH or QFE).
[4R] MAX TO Pressing this key calls up the MAX TO DATA page.
For all other fields, refer to MAX TO DATA page.

ACARS FUNCTION PAGE 2



ACARS FUNCTION PAGE 2

Line 1 F-PLN RPT SEND	Pressing this key sends the flight plan report to the ground.
Line 2 POSITION RPT SEND	Pressing this key sends a Position Report to the ground.

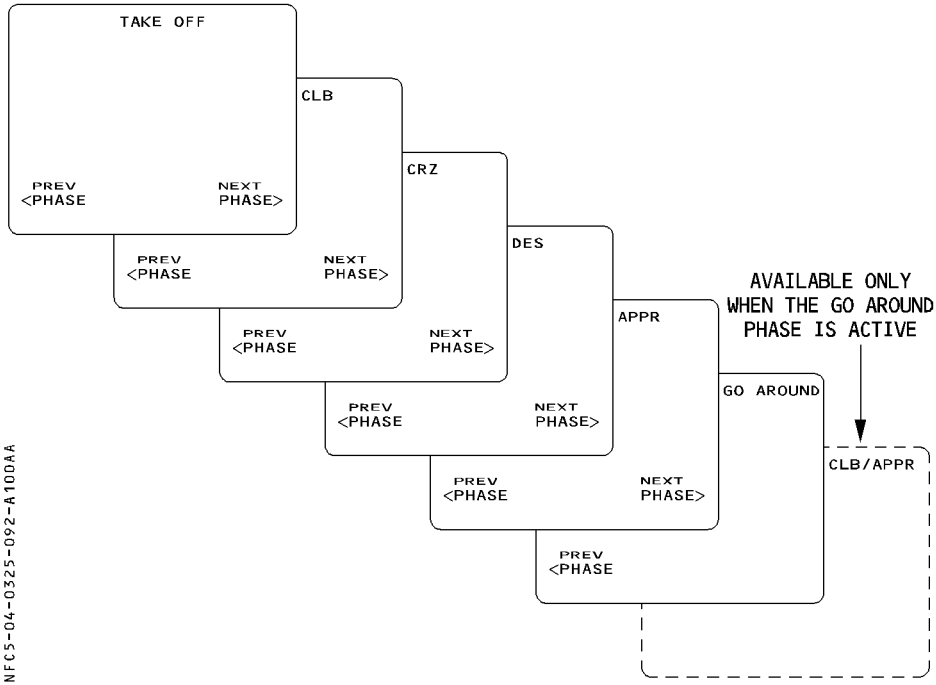
Note : — *No report can be sent, if "SEND" is not followed by a star.*
— *When a function (line 1 or 2) is deactivated through the navigation database policy file, the corresponding line is blank.*

[6L] RETURN	The pilot presses this key to revert to the DATA INDEX page.
[6R] PRINT FUNCTION	The pilot presses this key to access the PRINT FUNCTION page.

INTENTIONALLY LEFT BLANK

PERF PAGE

The flight plan is divided into the following phases :
PREFLIGHT, TAKEOFF, CLIMB, CRUISE, DESCENT, APPROACH, GO-AROUND, DONE.
Each phase, except for the preflight and done phases, has a performance (PERF) page. The PERF pages display performance data, speeds related to the various phases, and predictions.
Pressing the PERF key on the MCDU console calls up the performance page for the current active phase. Performance pages, relating to phases already flown, are not available.
In the preflight and done phases, pressing the PERF key brings up the takeoff performance page.
Pressing the PERF key in the done phase makes the phase transition to the preflight phase.

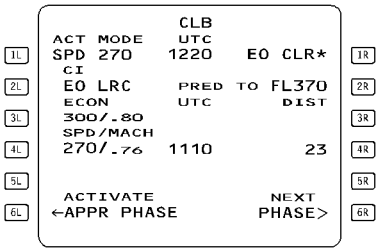


The FMGS flight phases are not related to the FWC flight phases.

Line 6	Fields may display two different prompts, depending upon whether the phase is active or not.
[6L] PREV PHASE	To review the performance page for the previous phase. The prompt is unavailable on the takeoff performance page. It is also unavailable for phases already flown.
[6L] ACTIVATE APPR PHASE	To activate, then confirm, the APPR phase. Available only on the page corresponding to the active phase.
[6R] NEXT PHASE	To review the performance page for the next phase.

Note : Engine-out condition

- *When the FMGS detects an engine-out condition, the system automatically calls up the performance page for the current flight phase (except when this occurs before the diversion point during takeoff or no EOSID exists in the flight plan) and displays "EO CLR*" in the [1R] field and EO LRC (engine-out long range cruise) in the [2L] field. On the CLB, CRZ and DES (when the descent phase is not active) PERF pages, the pilot can enter a cost index value and overwrite to "EO LRC". Clearing the cost index reverts to EO LRC.*
  If the pilot presses the [1R] key , the system reverts to the normal processing (with no engine failed) and suppresses the EO information. (Refer to 4.04.15).
- *If the engine-out condition is detected before the diversion point at takeoff, a temporary flight plan is created.*

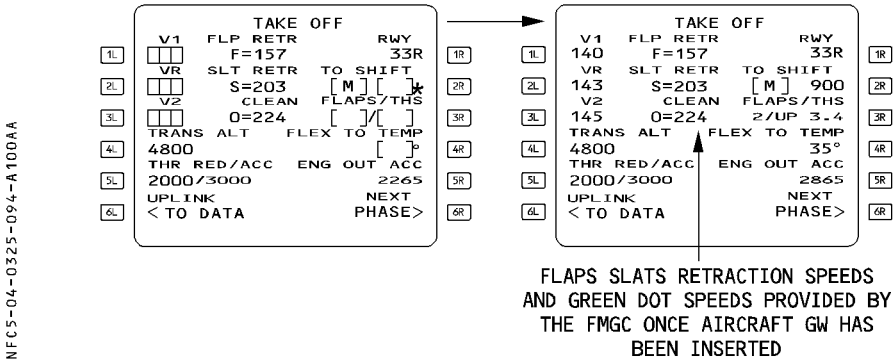


CLIMB PHASE ACTIVE
ENGINE OUT IS DETECTED

NFCS-04-0325-093-A100AA

PERF TAKEOFF PAGE

During the preflight phase, the pilot presses the PERF key to call up the takeoff performance page.



TITLE

TAKE OFF is in large white font, when the takeoff phase is not active, and in large green font when it is.

R
R

Note : If the takeoff shift or the runway is changed after V1, V2 or VR insertion, but the origin airport remains the same, the MCDU message "CHECK TAKEOFF DATA" is displayed, but all takeoff parameters are retained.

[1L] V1
[2L] VR
[3L] V2

The boxes remain amber, as long as the pilot does not make entries in them. The pilot can modify any entry, as long as the takeoff phase is not active.

Note : If the pilot does not enter V2, the SRS mode will not be available at takeoff.

[4L] TRANS ALT
(transion altitude)

This field displays the navigation database default altitude (if defined) once the origin airport is entered. The pilot can modify it.

[5L] THR RED
(thrust reduction altitude)

This is the altitude at which the pilot should reduce the thrust from TOGA/FLX to MAX CLIMB (CL detent) with all engines operative.

- The thrust reduction altitude defaults to 1500 feet above the runway elevation, or to the altitude set by the airline.
- The pilot can modify this altitude : The minimum is 400 feet above the runway elevation.

ACC
(Acceleration altitude)

This is the altitude at which the climb phase is triggered.
- The target speed jumps to the initial climb speed.
- The default value is 1500 feet above runway elevation.
- The flight crew can modify the value. The minimum value is 400 feet above runway elevation, though it is always higher than, or equal to, THR RED.

Note :
- *A clearing action reverts both values to the defaulted ones.*
- *When the crew selects an altitude on the FCU that is below THR RED, it brings THR RED and ACC down to this altitude. (The 400 feet minimum still applies).*

[6L] UPLINK TO DATA

This key calls up the UPLINK TO DATA REQ page.
It is only displayed in the preflight and done phases.

[1R] RWY or EO CLR

This field shows the takeoff runway selected on the active flight plan. The flight crew cannot make an entry from this field. The field shows dashes, if no runway has been inserted in the flight plan. EO CLR is displayed when an engine-out is detected.

R [2R] TO SHIFT

R The takeoff shift is the distance in meters or feet between
R the beginning of the runway and the aircraft's takeoff
R position. When taking off from an intersection, the flight
R crew should insert this value to ensure a correct update of
R the FM position. The takeoff shift value must be positive,
R and cannot be greater than the runway length.

[3R] FLAPS/THS

This is an optional pilot entry for the positions of the flaps and the trimmable horizontal stabilizer (THS) at takeoff.
It is for information only (no action). The flight crew can modify it until takeoff, by entering "UP X.X" or "X.X UP", or "DN X.X" or "X.X DN" for the THS.

[4R] FLX TO TEMP

The pilot inserts the FLX TO temperature for FLX takeoff setting purposes. The pilot can only enter it during preflight. The system sends it to the FADEC and displays the entered data on the upper ECAM display. The TEMP value is always entered in degrees Celsius.

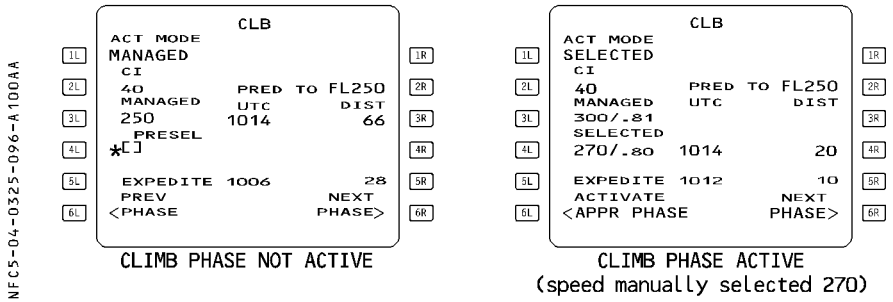
[5R] ENG OUT ACC

This field displays the engine-out acceleration altitude, as defined in the database, or is manually entered by the flight crew. This is for display only, as a reminder. It cannot be cleared. The above ACC altitude rules of [5L] apply to this field.

[6R] NEXT PAGE

This key calls up the climb performance page.

PERF CLIMB PAGE



CLIMB PHASE NOT ACTIVE

CLIMB PHASE ACTIVE
(speed manually selected 270)

TITLE	CLB is displayed in large white fonts when the climb phase is inactive, and in large green fonts if it is active.
[1L] ACT MODE	This field displays the preselected or active speed mode : SELECTED or MANAGED. The pilot cannot modify it from this field.
[2L] CI (Cost Index)	This field displays the cost index, as initialized on the INIT A or defaulted from the database, or inserted in this field by the pilot. EO LRC automatically replaces the cost index value in case of engine-out.
[3L] MANAGED	This field displays the FMGS computed ECON speed/Mach (Refer to 4.02.20). Before CLIMB phase is active, if the preselected speed mode is SELECTED, a star is displayed next to the MANAGED speed. Pressing the 3L key in this case preselects MANAGED speed, and 4L reverts to brackets.

[4L] PRESEL or SELECTED

If the climb phase is not active :

This field displays PRESEL as long as the climb phase is not active. The pilot can enter a preselected speed only.

If the climb phase is active :

The title of this field becomes SELECTED.

This field displays the selected (or preselected) SPD or MACH target. The pilot cannot modify it directly in this field, but can adjust it with the SPD/MACH selection knob on the FCU.

If the pilot pushes in the FCU SPD/MACH selection knob to revert to managed speed, the system selects (or reselects) ECON SPD/MACH and [4L] is blank.

[5L] Blank or EXPEDITE

This field is blank as long as the aircraft is in preflight.

This field displays this legend when the takeoff or climb phase is active.

It indicates the time and distance required to reach the altitude displayed in the 2R field, in case of climb at green dot.

[6L] PREV PHASE

This field displays this legend if climb phase is not active. The pilot presses this key to call up the takeoff page.

[6L] ACTIVATE APPR PHASE

The field displays this legend if the climb phase is active.

Pressing this key once displays "CONFIRM APPR PHASE*". Pressing it again activates the approach phase.

[1R] EO CLR

The system displays the EO CLR prompt in case of engine out in climb.

[2R] PRED TO...

This field displays the target altitude for the predictions shown in 3R, 4R, or 5R. It defaults to FCU altitude, but the pilot can modify it to any altitude below CRZ FL.

[3R]
[4R]
[5R]

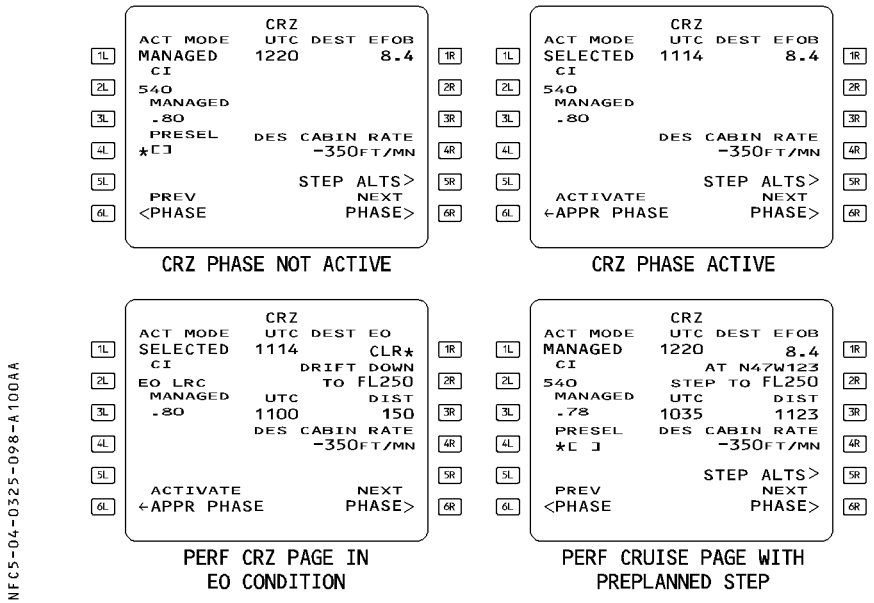
These fields show time and distance predictions for the target altitude selected in [2R], computed for the current vertical mode and speed mode (MANAGED, SELECTED, or EXPEDITE).

These fields are displayed only while the takeoff, or climb phase is active.

[6R] NEXT PHASE

The pilot presses this key to call up the PERF CRZ page.

PERF CRUISE PAGE



NFC5-04-0325-098-A100AA

TITLE — CRZ in white large font, when cruise phase is not active, in green large font, when it is.

[1L] ACT MODE — This field shows the preselected or active speed mode : SELECTED or MANAGED.
The pilot cannot modify it through this field.

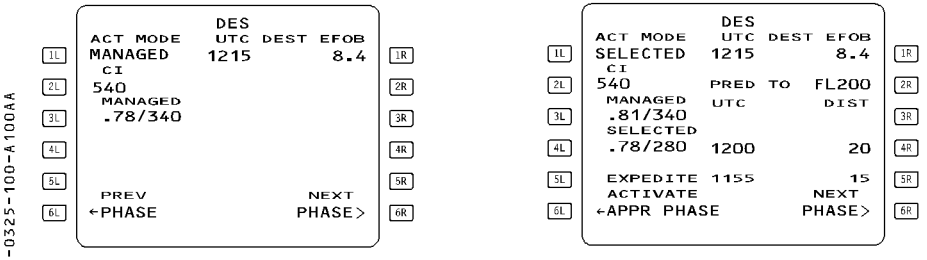
[2L] CI — This field shows the cost index as initialized on the init A page or defaulted from the database, or as inserted in this field by the crew.
EO LRC replaces automatically the cost index value in case of engine out.

[3L] MANAGED — This field displays the FMGS computed ECON speed/Mach (Refer to 4.02.20).
Before CRUISE phase is active, if the preselected speed mode is SELECTED, a star is displayed next to the MANAGED speed.
Pressing the 3L key in this case preselects MANAGED speed, and 4L reverts to brackets.

[4L] PRESEL — <u>If cruise phase is not active :</u>
The pilot can enter a preselected speed or Mach number.
<u>If cruise phase is active :</u>
This field is blank.

[6L] PREV PHASE or	The pilot can press this key to call up the climb page, if the cruise phase is not yet active.
[6L] ACTIVATE APPR PHASE	This field displays this legend if the cruise phase is active. The flight crew presses the key once to change the legend to "CONFIRM APPR PHASE*". A second press activates the approach phase. *Note : If the pilot activates the approach phase inadvertently, it can reselect the cruise flight level into the progress page to reactivate the cruise phase.*
[1R] TIME/UTC DES EFOB	Before takeoff this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field displays automatically the predicted arrival time (UTC) at destination. After takeoff it displays the predicted arrival time at destination (UTC) and the remaining fuel on board. EO CLR is displayed when an engine out is detected.
[2R] STEP TO FL XX, DRIFT DOWN TO FL XX, or TO T/D	The field, in combination with 3R, displays the predictions for the step point and the step altitude, the drift down altitude, or the Top of Descent.
[3R] TIME/UTC and DIST	This field displays the time and distance to go to the various points identified in 2R.
[4R] DES CABIN RATE	This field displays Max [computed DES cabin rate, maximum descent cabin rate]. The pilot may modify the value : the FM recomputes then the top of descent in order to match this value. If the FM cannot match the pilot entry, the FM computed value overwrites the pilot entry. A clear action reverts to the default value (– 350 feet per minute). DES CAB RATE being a negative value, 'minus" is not a necessary entry.
[5R] STEP ALTS	This key calls up the STEP ALTS page (see vertical revision).
[6R] NEXT PHASE	This key calls up the DES page.

PERF DESCENT PAGE



NFC5-04-0325-100-A100AA

DES PHASE NOT ACTIVE WITH MANAGED SPEED/MACH SELECTED

DES PHASE ACTIVE WITH SELECTED SPEED/MACH

TITLE — DES is in large white font if the descent phase is not active ; it is in large green font, if it is.

[1L] ACT MODE — This field displays the preselected or active speed mode (MANAGED or SELECTED). The flight crew cannot modify it through this field.

[2L] CI — This field displays the cost index, as initialized on the INIT A page or defaulted from the database, or inserted in this field by the flight crew. The flight crew cannot modify it when the descent phase is active.

[3L] MANAGED

<u>If the descent phase is not active :</u>

Before the flight crew makes any entry. This field displays MANAGED in white, with the associated ECON descent Mach or speed in blue. The crew may overwrite the ECON descent Mach or speed by entering a Mach number or a speed in this field. The system uses the pilot entry to compute the descent profile. The descent may be flown in managed using this new pilot entry.

The entry is modifiable. It can be cleared to revert to ECON speed/Mach.

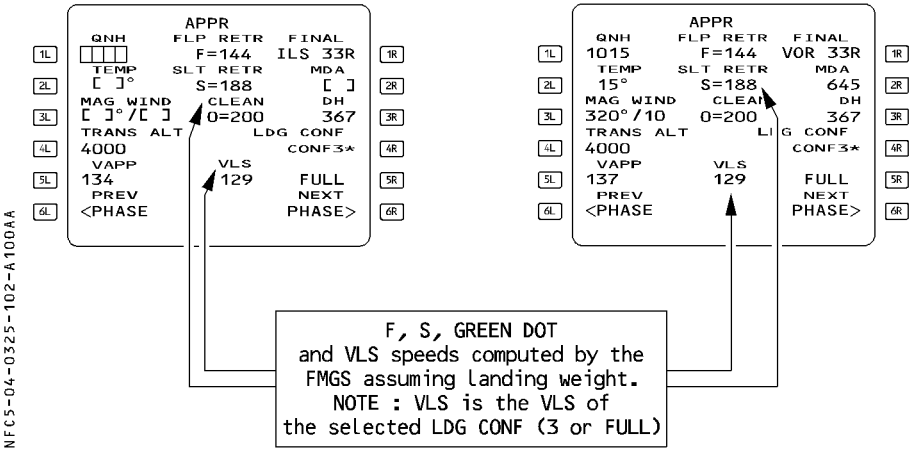
<u>If the descent phase is active :</u>

The flight crew cannot make an entry in this field.

The field displays the ECON speed/Mach or the speed/Mach value previously entered by the pilot.

[4L] blank or SELECTED	<u>If the descent phase is not active, or the descent phase is active but the active speed mode is MANAGED :</u> This field is blank. <u>If the descent phase is active and the active speed mode is SELECTED :</u> The field displays the speed or Mach target manually selected by the pilot. "SELECTED" is displayed in the [1L] field. To modify the field value, the pilot will use the SPD/MACH selector knob of the FCU. [4L] field and FCU window will display the same value. Pushing in the FCU speed selector knob activates the managed SPD/MACH target displayed in the [3L] field.
[5L] Blank or EXPEDITE	If the descent phase is not active this field is blank. Displays this legend if the descent phase is active. It indicates the time and distance required to reach the altitude displayed in the 2R field at MMO/VMO speed. The pilot cannot select the EXPEDITE mode through this field.
[6L] PREV PHASE or ACTIVATE APPR PHASE	This key calls up the cruise phase page if the descent phase is not yet active. Displayed if the descent phase is active. First press causes "CONFIRM APPR PHASE" to be displayed. Second press activates the approach phase.
[1R] TIME/UTC DEST EFOB	Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field displays automatically the predicted arrival time (UTC) at destination. After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board. EO CLR is displayed when an engine-out is detected.
[2R] PRED TO...	This field displays the target altitude for the predictions in [3R] [4R], or [5R] . The display defaults to the altitude selected on the FCU. The flight crew can modify it to any altitude lower than present altitude.
[3R] [4R] [5R]	These fields display time and distance predictions down to the target altitude selected in [2R], computed for the current vertical mode (DES or OP DES, EXPEDITE) and the indicated speed mode (MANAGED, SELECTED, or EXPEDITE).
[6R] NEXT PHASE	The pilot presses this key to call up the PERF APPR page.

PERF APPR PAGE



TITLE — APPR is in large white font, if the approach phase is not active ; it is in large green font, if it is.

[1L] QNH — This field displays brackets, when the aircraft is more than 180 NM from the destination. Inside 180 NM, a mandatory amber box appears.
The pilot must enter the QNH, either in hPa (three or four digits), or in inches of mercury (two digits, decimal point, and two more digits).
The system interprets :
. 1003 as 1003 hPa ;
. 29.92 as 29.92 inches.
The pilot can modify this entry at any time.
The system uses the QNH to compute the cabin repressurization segment.

[2L] TEMP — This field displays the temperature at destination. The field displays brackets until the pilot enters the temperature. The pilot can modify this figure.
The system uses this temperature to refine its computation of the descent profile (ISA model).

[3L] MAG WIND
The flight crew enters the magnetic wind in knots at the destination in this field. The system transmits any entry made in this field to the vertical revision and flight plan B pages (which display wind direction as true, not magnetic).

[4L] TRANS ALT
This field displays the transition altitude taken from the data base (small font) or entered by the flight crew (large font). The flight crew can modify it at any time.

[5L] VAPP
The FMGC computes this approach speed, using the formula: VAPP = VLS + 1/3 of the headwind components (limited to VLS + 5 as a minimum and VLS + 15 as a maximum).
The flight crew can modify VAPP. A clear action reverts VAPP to the computed value.

Note : VLS = 1.23 VS1G of the selected landing configuration (full or 3).

[6L] PREV PAGE
This field displays this legend if the approach phase is not active.
Pressing this key calls up the descent performance page.

[1R] FINAL
This field displays the approach specified in the flight plan. The flight crew cannot modify it through this field.

[2R] MDA/MDH
This field displays the minimum descent altitude (or minimum descent height if the QFE pin program is activated), with associated brackets. The flight crew inserts the value, which it can modify at any time.
If the flight crew makes an entry in [3R] or changes the approach, it clears this figure.

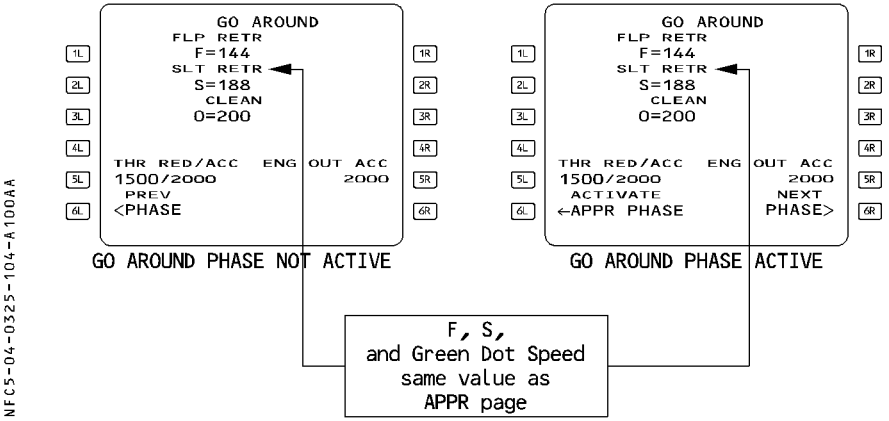
[3R] DH
If the flight plan includes an ILS approach, this field displays "DH" and empty brackets. The flight crew inserts the decision height. The system will accept an entry of "NO". If the flight crew inserts an MDA or an MDH, this erases the decision height, and this field reverts to brackets. The DH range is 0 to 700 feet.

[4R] LDG CONF
CONF 3
The flight crew can select configuration 3 by pressing the 4R key.
This moves the * down to the [5R] field, which is displaying "FULL".

[5R] FULL
The flight crew can use this key to select configuration FULL when necessary configuration FULL is the default landing configuration.

[6R] NEXT PHASE
Pressing this key calls up the go-around performance page.

PERF GO AROUND PAGE



TITLE

GO AROUND is in large white font, if the go-around phase is not active ; it is in large green font, if it is.

[5L] THR RED ACC

This field displays the thrust reduction altitude and the acceleration altitude.

Thrust reduction altitude :

- Altitude at which thrust must be reduced from takeoff/go-around thrust to maximum climb thrust
- "CLB" or "LVR CLB" flashing on flight mode annunciator.
- Defaults to 1500 feet above destination runway elevation, or to the altitude set by the airline.
- Can be modified by the crew (minimum 400 feet above destination runway elevation).

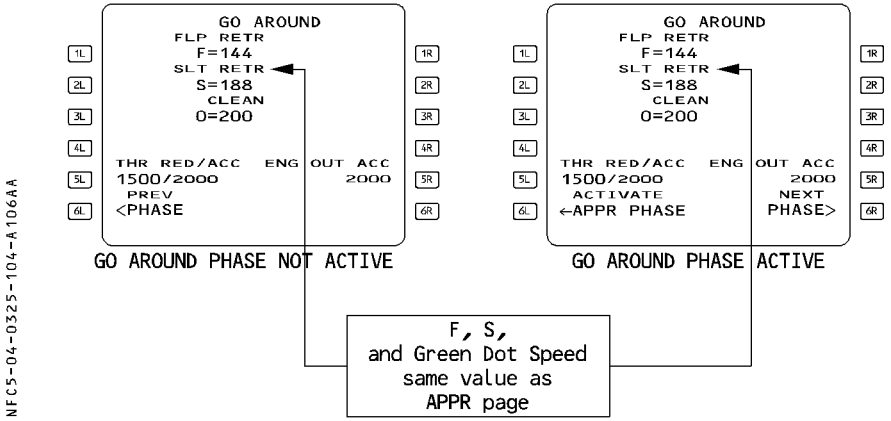
Acceleration altitude :

R
R
R

- The target speed does not automatically increase to Green Dot Speed, when climbing through GA accel. altitude. The pilot has to manually select OPEN CLB mode.
- Defaults to 1500 feet above destination runway elevation, or to the altitude set by the airline.
- Can be modified by the crew, but is always equal to (or higher than) the thrust reduction altitude.

[3L] MAG WIND	The flight crew enters the magnetic wind in knots at the destination in this field. The system transmits any entry made in this field to the vertical revision and flight plan B pages (which display wind direction as true, not magnetic).
[4L] TRANS ALT	This field displays the transition altitude taken from the data base (small font) or entered by the flight crew (large font). The flight crew can modify it at any time.
[5L] VAPP	The FMGC computes this approach speed, using the formula: VAPP = VLS + 1/3 of the headwind components (limited to VLS + 5 as a minimum and VLS + 15 as a maximum). The flight crew can modify VAPP. A clear action reverts VAPP to the computed value. *Note : VLS = 1.23 VS1G of the selected landing configuration (full or 3).*
[6L] PREV PAGE	This field displays this legend if the approach phase is not active. Pressing this key calls up the descent performance page.
[1R] FINAL	This field displays the approach specified in the flight plan. The flight crew cannot modify it through this field.
[2R] MDA/MDH	This field displays the minimum descent altitude (or minimum descent height if the QFE pin program is activated), with associated brackets. The flight crew inserts the value, which it can modify at any time. If the flight crew makes an entry in [3R] or changes the approach, it clears this figure.
[3R] DH	If the flight plan includes an ILS approach, this field displays "DH" and empty brackets. The flight crew inserts the decision height. The system will accept an entry of "NO". If the flight crew inserts an MDA or an MDH, this erases the decision height, and this field reverts to brackets. The DH range is 0 to 700 feet.
[4R] LDG CONF CONF 3	The flight crew can select configuration 3 by pressing the 4R key. This moves the * down to the [5R] field, which is displaying "FULL".
[5R] FULL	The flight crew can use this key to select configuration FULL when necessary configuration FULL is the default landing configuration.
[6R] NEXT PHASE	Pressing this key calls up the go-around performance page.

PERF GO AROUND PAGE



TITLE

GO AROUND is in large white font, if the go-around phase is not active ; it is in large green font, if it is.

[5L] THR RED ACC

This field displays the thrust reduction altitude and the acceleration altitude.

Thrust reduction altitude :

- Altitude at which thrust must be reduced from takeoff/go-around thrust to maximum climb thrust
- "CLB" or "LVR CLB" flashing on flight mode annunciator.
- Defaults to 1500 feet above destination runway elevation, or to the altitude set by the airline.
- Can be modified by the crew (minimum 400 feet above destination runway elevation).

Acceleration altitude :

- Altitude at which target speed jumps to green-dot speed (see the note below).
- Defaults to 1500 feet above destination runway elevation, or to the altitude set by the airline.
- Can be modified by the crew, but is always equal to (or higher than) the thrust reduction altitude.

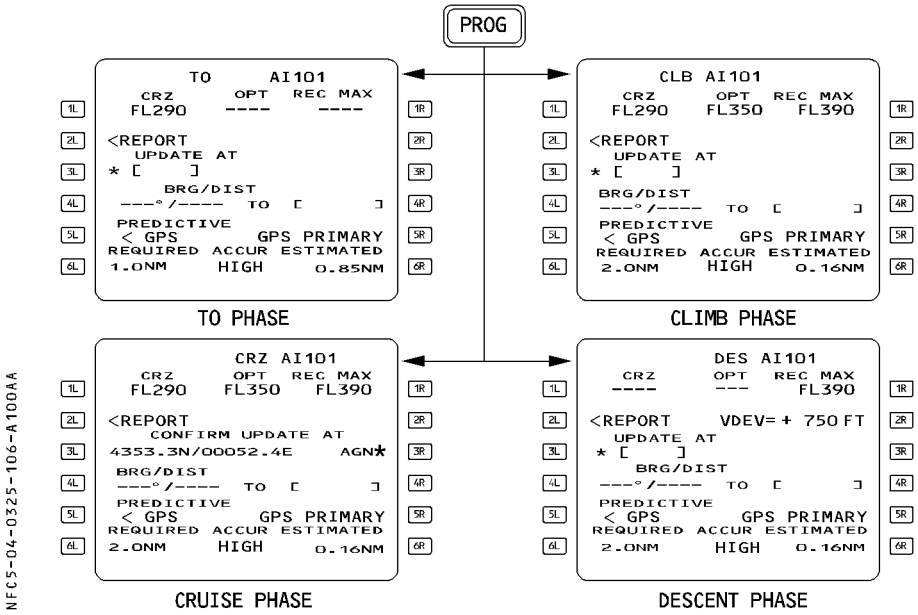
[6L] PREV PHASE or	This field displays this legend if the go-around phase is not active. Pressing the key calls up the PERF APPR page.
ACTIVATE APPR PHASE	This field displays this legend if the go-around phase is active. Pressing it once makes "CONFIRM APPR" appear. A second press activates the approach phase.
[5R] ENG OUT ACC	This display has the same characteristics as the display beside the 5R key on the takeoff page. It is for display only, and the pilot can modify it.
[6R] NEXT PHASE	Pressing this key calls up the PERF APPR page.
[IR] Blank or EO CLR*	This field is normally blank. EO CLR* is displayed when GO AROUND is the active phase and an engine-out condition is detected.

Note : When the go-around phase is active, if the pilot enables ALTN or if the pilot inserts a new destination in the active flight plan and a new cruise flight level on the progress page, the go-around phase shifts automatically into the climb phase. (The target speed jumps from green dot speed to initial climb speed).

PROG PAGES

The progress page is a multifunction page that enables the pilot to :

- Select a new cruise flight level ;
- Crosscheck the navigation accuracy of the Flight Management (FM) system and validate it ;
- Update the FM position ;
- Monitor the descent.



TITLE — Different for each flight phase (see above). The vertical phase is in large green font. The flight number is in large white font. EO is large amber font, if the engine-out condition is detected.

Line 1 CRZ (blue) — This line displays the cruise flight level, inserted on the INIT A page or directly in this field in blue. If the flight crew uses the FCU to select an altitude that is higher than the one displayed in this field, the system changes the number displayed to agree. In this line, the flight crew cannot insert a flight level that is lower than the FCU-selected altitude.
This field shows dashes when the descent or approach phase is active.

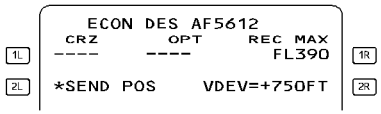
OPT — This field displays the optimum flight level (in green), that is computed based on the current gross weight, cost index, temperature, wind and a minimum estimated cruising time of 15 minutes.
It displays dashes if an engine-out is detected.

REC MAX — This field displays the recommended maximum altitude (in magenta), that is computed based on the current gross weight and temperature. It provides the aircraft with a 0.3 g buffet margin, a minimum rate of climb at MAX CL thrust, and level flight at MAX CRZ thrust. This field is limited to FL 398.
If one engine is out, this field displays the recommended maximum engine-out altitude, that is computed based on the long-range cruise speed and assuming that anti-ice is off.

[2L] REPORT — This key calls up the REPORT PAGE.

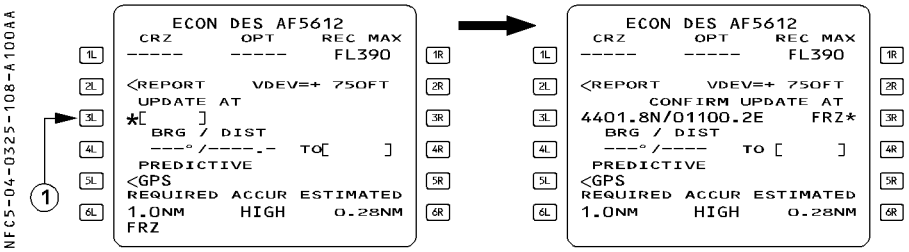
R [2R] VDEV — This field is displayed during the descent and approach phases, when NAV mode is engaged, or in HDG mode, provided that the crosstrack error (XTK) is less than 5 NM. It displays the vertical deviation between the aircraft's current altitude and the FMS-computed vertical profile.

NFCS-04-0325-107-A100AA



Line 3
UPDATE AT — The flight crew can update the FMS position via this field by entering either the ident of a waypoint, a NAVAID, an airport, a latitude and longitude (L/L), a place/bearing/distance (PBD), or a place-bearing/place-bearing (PB/PB).
When the flight crew has entered this data, this field changes its format to : "CONFIRM UPDATE AT", followed by the latitude/longitude and ident of the inserted position with an asterisk.
The flight crew presses the right-hand key adjacent to the asterisk to confirm the update, when the aircraft overflies the inserted position.

Note : If no ident has been inserted, the field displays "ENTRY" instead of an ident.



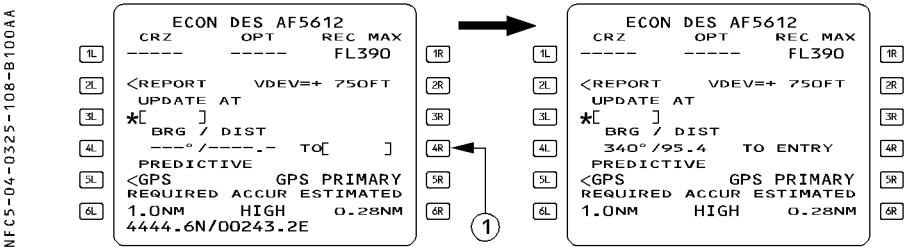
Line 4 BRG/DIST

On this line, the pilot can enter an airport, a waypoint, a navaid, or a runway. The pilot may enter each as an ident, a latitude/longitude (L/L), a place/bearing/distance (PBD), or a place-bearing/place-bearing (PBX). The field then shows the FMGC-computed bearing and distance from this site to the aircraft's present position. The last distance digit is in 1/10 of a NM. If it does not have an ident, the point is called "ENTRY".

Example :

BRG/DIST

340°/95.4 to ENTRY

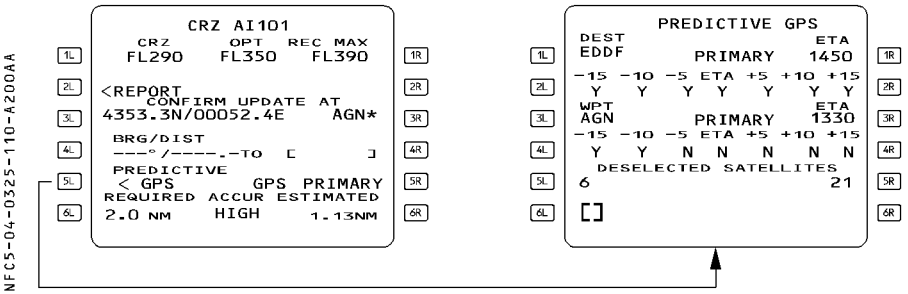


[5L] PREDICTIVE GPS	This prompt gives access to the PREDICTIVE GPS page.
[5R] GPS PRIMARY	This prompt is displayed, when the FMS navigation mode is GPS PRIMARY. When GPS PRIMARY is not available, or navigation mode is not GPS/IRS, this field is blank. The scratchpad displays the relevant "GPS PRIMARY" message when this prompt appears ; and "GPS PRIMARY LOST", when the field turns to blank.
[6L] REQUIRED	This field displays the default value for the required navigation accuracy level. The pilot can modify it. Provided no pilot entry has been made, the default value changes, according to the actual flight area (En route, terminal, approach see 1.22.20).
ACCUR HIGH/LOW	This field shows the flight management system's estimate of the navigational accuracy. "HIGH" indicates that the FMS estimates that the navigational accuracy matches the accuracy criteria of the area currently flown. "LOW" indicates that the criteria are not matched.
[6R] ESTIMATED	This field displays the current estimated navigation accuracy value (EPE) as computed by the FMS.

PREDICTIVE GPS PAGE

Note : This page is only operative with Honeywell GPS. With GPS Litton, all fields are dashed.

The pilot accesses this page by pressing the PREDICTIVE GPS prompt of the PROG page. This page displays information relative to predictive availability of GPS PRIMARY at destination, and at any waypoint selected by the crew.



[1L] DEST — Destination, airport as currently selected in active flight plan. It is not modifiable. This field displays dashes, when no destination airport exists.

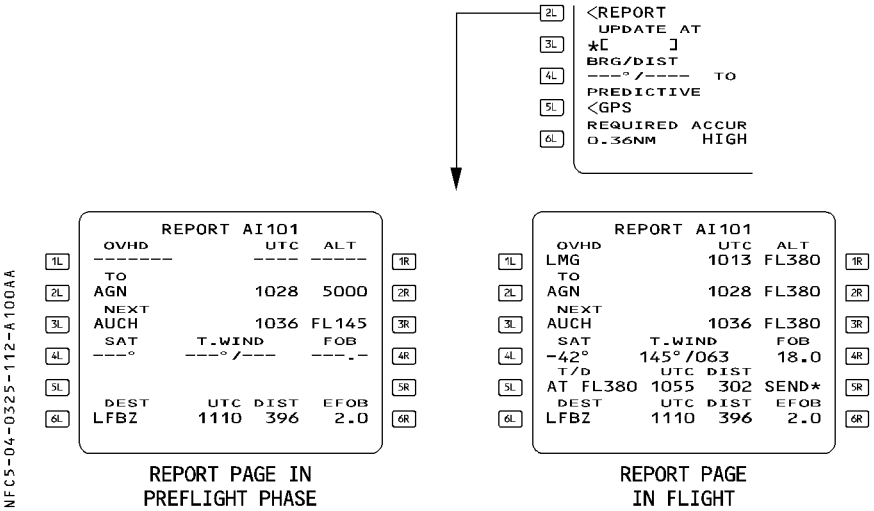
[1R] ETA — This field is defaulted to the Estimated Arrival Time, as computed by the FMS (small blue font). The pilot may enter a value in this field (large blue font). Amber boxes are displayed, when no prediction exists, or the crew entry has been cleared.

Line 2 PRIMARY Y/N — Predicted primary status at destination airport, at the following times :
Estimated time of arrival ± 5, 10, 15 minutes.
Availability of GPS PRIMARY at the corresponding time is indicated by Y, when PRIMARY is predicted to be available; and, by N, when GPS PRIMARY is predicted not to be available.
These fields are blanked when the destination [1L] field, or the time [1R] field is not defined.

[3L] WPT	The pilot may enter a reference waypoint in this field. Blue brackets are displayed, when no entry has been made.
[3R] ETA	When a reference waypoint has been entered in the [3L] field, amber boxes are displayed. The crew is requested to enter a reference time in this field.
Line 4 PRIMARY Y/N	Information equivalent to [2L] / [2R] is displayed for any pilot-selected waypoint. The corresponding time of arrival is also displayed.
Line 5 DESELECTED SATELLITES and Line 6 SATELLITES	Enables the pilot to deselect up to four satellites by inserting the corresponding satellite number ; the number is then displayed in large blue font. When deactivated, the satellites are not considered for predictive GPS availability at destination, or at the selected waypoint. The deselection is cancelled when the entry is cleared (blue brackets are displayed), or the field is overwritten by a different satellite number.

REPORT PAGE

The pilot calls this page by pressing the [2L] key on the PROG page :



REPORT PAGE IN PREFLIGHT PHASE

REPORT PAGE IN FLIGHT

This page displays information related to the FROM, TO, NEXT and DEST waypoints, as well as the current wind, temperature, distance and time to the next cruise profile change.

TITLE (White) — Displays the flight number. This line displays EO in amber, in case an engine-out is detected.

[1L] OVHD (green) — Displays the last sequenced waypoint. This field never displays the pseudo-waypoints and the F-PLN markers (T-P, PPOS, IN-BND, OUT-BND).

[1R] UTC/TIME ALT (green) — This field displays the time and altitude recorded at the time of sequence.

[2L]-[2R] TO (green) — This field displays the active waypoint, predicted time of arrival and predicted altitude at this waypoint.

Note : Time and altitude values are identical to those values on the F-PLN pages.

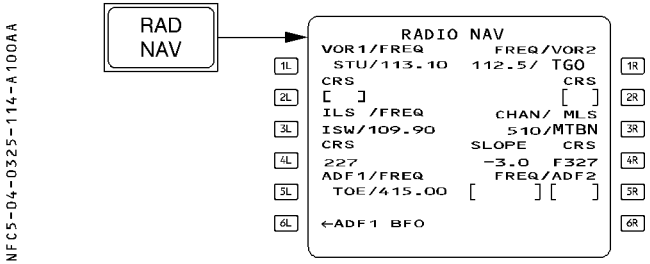
[3L]-[3R] NEXT (green) — Same information for the next waypoint.

[4L] [4R] SAT/T.WIND/FOB (green)	This field displays the static air temperature, the wind direction and velocity, and the FOB recorded at waypoint sequencing.
[5L] T/D/UTC/DIST (green)	This field displays the estimated time, and the distance to go to the next change of the cruise profile (T/D, S/C, S/D). These data are only displayed when the cruise phase is active.
[5R] SEND* (blue)	The crew uses this prompt to downlink a position report. This field may be blank, depending on airline policy.
Line 6 DEST/UTC/DIST/EFOB	This field displays the estimated time of arrival, the distance along the F-PLN, and the estimated fuel on board at destination. This display is identical to the information on the F-PLN pages.

Note : No data can be inserted or modified on the REPORT page.

RADIO NAV PAGE

This page enables the pilot to select or verify the radio navaids, tuned for display purposes only.
These navaids include : VOR, VOR/DME, TAC, VORTAC, ILS, and ADF.
If either RMP is set on NAV, this page is blanked on both MCDUs.



NFC5-04-0325-114-A100AA

Line 1 VOR1/FREQ FREQ/VOR2	This line displays the identifiers and frequencies of VORs 1 and 2, whether they are automatically or manually tuned. To manually tune a VOR, the pilot inserts the ident or frequency. If the ident is not in the database, the new navaid page comes up. A “clear” action reverts the selection to the autotuned navaid.
Line 2 CRS	This line displays courses for the navaids in Line 1. The pilot can manually enter the courses through these fields.
[3L] ILS/FREQ	This field displays the ident and frequency of an ILS. It is autotuned, if the ILS is associated with the departure runway, or if the flight plan shows an ILS approach selected for the destination. The ILS may also be entered manually. When the manually-entered ILS differs from the ILS that would be autotuned, RWY–ILS MISMATCH appears.
[4L] CRS	This field displays the course associated with the ILS in Line 3. It comes up automatically, when an ILS is autotuned, or if an ILS has been manually tuned via its ident. Otherwise, the course must be entered manually. The course may be backbeam (Bxxx) or frontbeam (Fxxx).

[3R] CHAN/MLS	The pilot manually tunes an MLS by its ident or its channel. The system automatically tunes the associated course and slope. *Note : If an MLS is tuned while an ILS was tuned, the ILS is deselected.*
[4R] SLOPE CRS	In this field, the pilot enters the slope and course of the MLS. The course may be backbeam (Bxxx) or frontbeam (Fxxx).
Line 5 ADF1/FREQ FREQ/ADF2	This line displays the identifiers and frequencies of ADFs 1 and 2. The pilot can use the ident or the frequency to manually tune the ADF.
Line 6 ADF1/BFO BFO/ADF2	When an ADF is selected, these fields display an ADF/BFO prompt. The flight crew presses the key once to erase the arrow and put the ADF in BFO mode. A clear action brings the arrow back and cancels BFO.

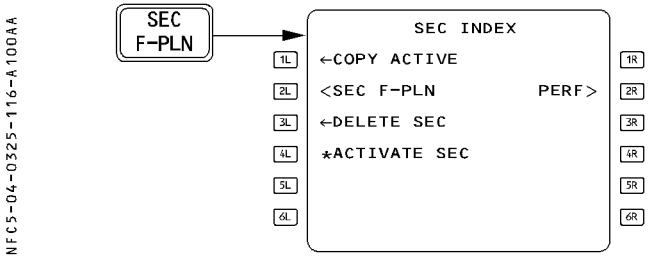
Note : – The autotune function only works for navaids stored in the database.
– When tuning manually, the operator should use the ident, rather than the frequency, unless the navaid is not in the database.
– Manually-tuned frequencies are displayed in large font.

SECONDARY PAGES

The SEC F-PLN key on the MCDU console allows the flight crew to call up the secondary index page and the secondary flight plan page. The secondary flight plan is generally for a diversion, for predictable runway changes for takeoff or landing, or for training.
There are two types of secondary index pages. The type selected depends on the presence of a secondary flight plan.

SECONDARY INDEX PAGE

A SECONDARY FLIGHT PLAN IS ALREADY DEFINED



NFC5-04-0325-116-A10DAA

[1L] COPY ACTIVE (blue) — The flight crew presses this key to copy the active flight plan into the secondary flight plan and delete the previous secondary plan.

[2L] SEC F-PLN (white) — The flight crew presses this key to call up the secondary flight plan pages.

[3L] DELETE SEC (blue) — The flight crew presses this key to delete the current secondary flight plan.

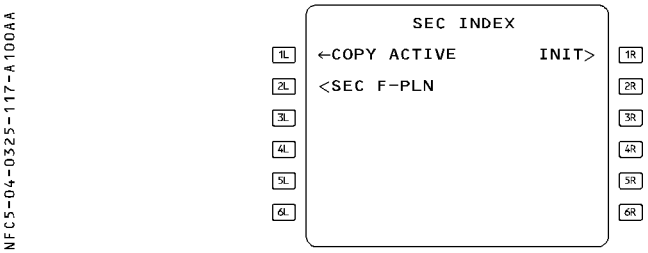
[4L] ACTIVATE SEC (amber) — The flight crew presses this key to activate the secondary flight plan as the active flight plan.

Note : "ACTIVATE SEC" routinely appears if the HDG/TRK mode is active. If the NAV mode is active, "ACTIVATE SEC" appears only if the active and secondary flight plans have a common active leg.

[1R] INIT (white) — This field displays this prompt when the secondary flight plan is not defined as a copy of the active flight plan. Pressing this key calls up the SEC INIT A and B pages.

[2R] PERF (white) — The flight crew presses this key to call up the performance pages for the secondary flight plan.

A SECONDARY FLIGHT PLAN IS NOT DEFINED



[1L] COPY ACTIVE (blue)	The pilot presses this key to copy the primary active flight plan into the secondary flight plan.
[2L] SEC F-PLN (white)	The pilot presses this key to call up the secondary flight plan pages.
[1R] INIT (white)	The pilot presses this key to call up the secondary INIT page. It is similar to the active INIT page, but blue brackets replace all the amber boxes.

SECONDARY FLIGHT PLAN PAGES

The secondary flight plan pages A and B are identical to those of the active flight plan, but are automatically sequenced, only when the secondary is copied from the primary and their active legs are identical.
The active and secondary flight plans pages differ from each other as follows :

Secondary lateral revision pages :
- ERASE and INSERT are not displayed.
- OFFSET and FIX INFO are not available.
- A lateral revision of the secondary flight plan does not create a temporary flight plan : All revisions are directly applied to the secondary flight plan.

Secondary vertical revision pages :
- A vertical revision on the secondary flight plan does not create a temporary flight plan.

Secondary init A and B pages :
- They use blue brackets, instead of amber boxes.
- They have no align prompt.
- They do not provide for slewing or entering data in the 4L-4R fields (airport reference).

Secondary step altitude pages

– These pages operate as the primary STEP ALTS page, except that optimal step, savings are not available.

Secondary wind pages :

– They have no history wind page.

Secondary performance pages :

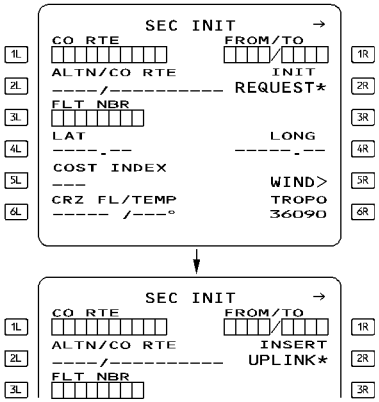
– All boxes are replaced by blue brackets.
– They have no engine-out mode, no engine-out long range cruise cost index.
– They have no expedite predictions.
– They have no ACTIVATE/CONFIRM APPROACH PHASE prompt.
– They have no PRED TO ALTN predictions on the PERF CLB and PERF DES pages.
– They have no engine-out drift down, no top of descent, no cabin descent rate information on the PERF CRZ page.

The secondary flight plan has no FUEL PRED page.

Secondary INIT A page is also used to request or display an uplink INIT message received after engine start.

This uplink INIT message can be cleared or inserted as SECONDARY INIT data.

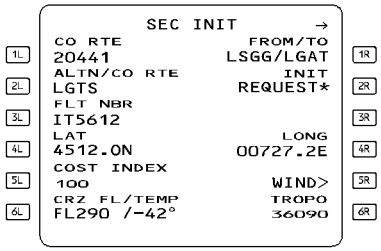
NFC5-04-0325-119-A100AA



[2R] INIT REQUEST* Enable to request init data from the ground or,

[2R] INSERT UPLINK * A downlink message has been received following a request.
The message can be cleared or entered in the SEC INIT page.

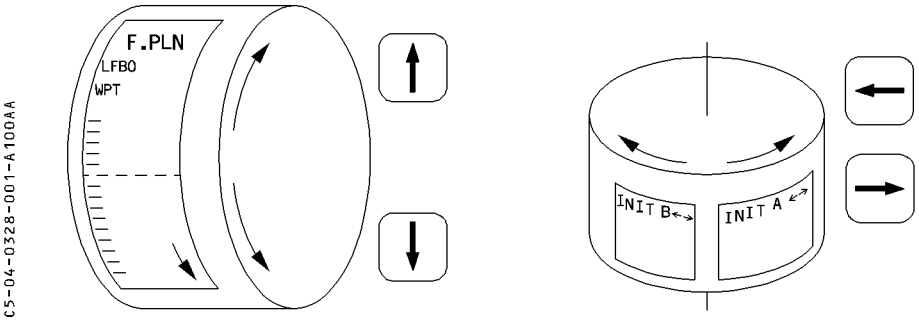
NFC5-04-0325-119-B100AA



SECONDARY INIT A PAGE
AFTER UPLINK MESSAGE
INSERTION.

GENERAL

The Flight Management and Guidance System (FMGS) displays information on several "pages". When a page cannot display all of the assigned information, it cues the pilot to call up additional information. There are three types of pages, and each type has its particular way of cuing the pilot to call up additional information.



NFCS-04-0328-001-A100AA

First type

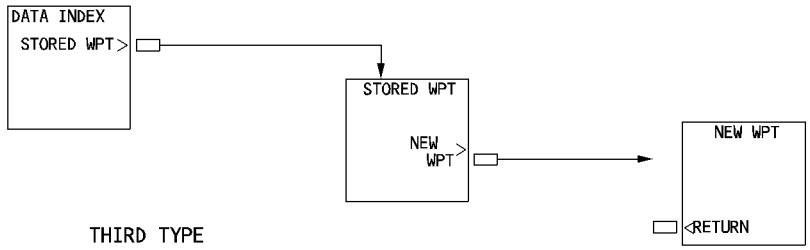
When this page cannot simultaneously display all the information on the screen (more information than the six pairs of lines can hold), the pilot can scroll up or down the page. In this case, the screen displays a ↑↓ symbol in the bottom right-hand corner (F-PLN pages, secondary F-PLN page, departure/arrival pages,...).

Second type

When the information is on successive pages, the pilot presses the "→" or "←" keys to sequentially call up these pages.
In this case, an arrow is displayed in the top right-hand corner of the screen (INIT pages).

Third type

When different types of information are on successive pages, the pilot calls up these pages by pressing the key adjacent to the prompts : >, < or *.

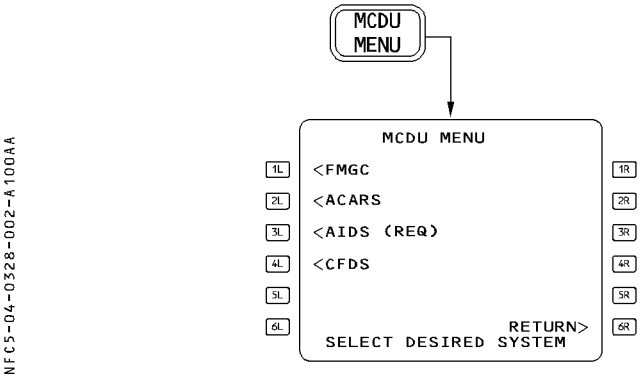


NFCS-04-0328-001-B100AA

MCDU MENU PAGE

R This page lists the various systems which are accessible via the MCDU. The system automatically displays this page at power up.

R



The pilot selects a system by pressing the key adjacent to the name of that system. The screen shows the name of the selected system in :

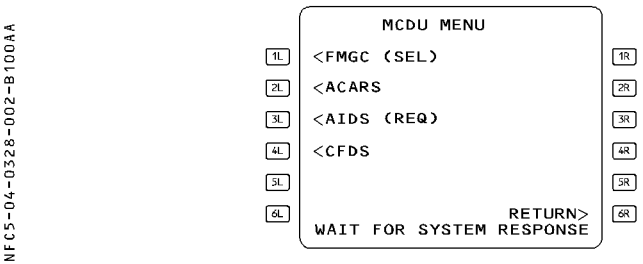
- Green, if communication is established.
- Blue, associated with the (SEL) indicator, until communication is established. The scratchpad displays "WAIT FOR SYSTEM RESPONSE".
- White, associated with the (TIME OUT) indicator, if the MCDU cannot establish communication with the selected system.

When a system calls for the pilot's attention, the MCDU displays "REQ" next to the system's name, and the "MCDU MENU" annunciator lights up.

When the pilot presses the key next to the name of the system that requires attention, the "MCDU MENU" annunciator light goes off.

When the MCDU is communicating with a system other than the FMGC, the pilot should use the MCDU MENU page to revert to the FMGC system.

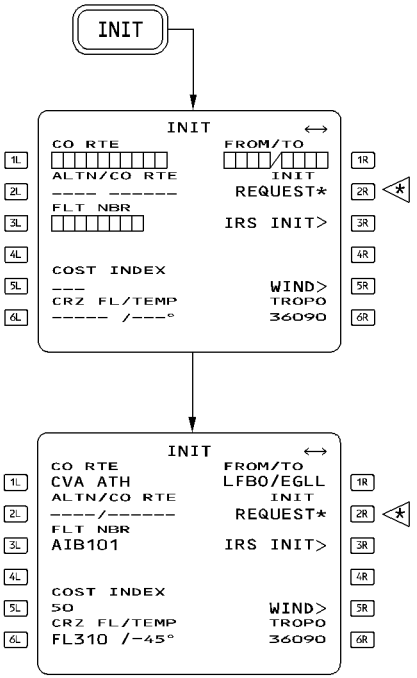
R



INIT A PAGE

The flight crew uses the INIT A page in pre-flight phase, to initialize the flight plan and align the inertial reference system.

- The flight crew accesses this page, by pressing the INIT key on the MCDU console.
- The flight crew can also call up this page by pressing :
  - The "→" or "←" keys on the MCDU console, when on the INIT B page, or
  - The key next to "RETURN" or "INSERT" on the ROUTE SELECTION page, or
- The INIT A page can also be accessed in flight.
- When in the done phase, the pilot can press the INIT key to begin the next preflight phase.



NFC5-04-0328-003-A130AA

[1L] CO RTE (blue)	If the flight crew enters a company route number, the screen displays all data associated with that route (8 or 10 characters, depending on the pin program). Inserting the CO RTE into the RTE selection page also enters the CO RTE number in this field.
[2L] ALTN/CO RTE (blue)	This field is dashed, until a primary destination is entered in the 1R field. If a preferred alternate is associated with the primary destination, it is displayed in this field with the company route identification. The crew may manually enter an alternate and company route. If the preferred alternate is not associated with the primary destination, "NONE" is displayed in this field. When the alternate route and the primary destination do not match, the MCDU scratchpad displays "DEST/ALTN MISMATCH". If the primary destination is changed, this field is modified accordingly.
[3L] FLT NBR (blue)	The flight number automatically appears in this field, if it is stored with the company route. The flight crew may modify it, or enter a new number here.
[5L] COST INDEX (blue)	This is usually stored in the database, along with the company route. The flight crew may modify it, or enter a new value here. It defaults to the last entered value, if a value is not stored in the database.
[6L] CRZ FL/TEMP (cruise flight level and temperature)	The cruise flight level is usually stored in the database, along with the company route. If not, it has to be entered manually. If no cruise flight level is entered, the system will not furnish predictions, while the aircraft is on ground. The flight crew has to enter the temperature at cruise flight level in order to refine the predictions. Otherwise, these are computed for ISA conditions. (If no sign is entered, the system uses a plus).
[1R] FROM/TO (blue)	The flight crew can enter a city pair in this field (ICAO codes for city of origin and destination). This entry automatically deletes any previously-entered company route, and calls up the route selection page (if a company route exists). If one airfield of the pair is not in the database, the display changes to the NEW RWY page.

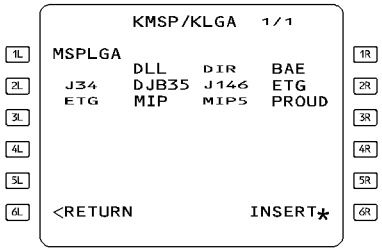
[2R] INIT REQUEST ◁	This prompt is displayed, if the pilot did not enter an active flight plan, or entered a flight number or a company route that is not in the aircraft database. Selecting this prompt sends the ground a request for active flight plan initialization (downlink message). When the asterisk is not displayed, a downlink message cannot be sent. The uplink flight plan is automatically inserted in the active flight plan, before engine start, provided that an active flight plan does not exist. After engine start, the uplink flight plan is sent to the secondary flight plan, and manually-inserted or rejected (Ref. FCOM 4.04.40).
[3R] IRS INIT	The flight crew presses this key to access the IRS INIT page.
[5R] WIND	The crew presses this key to access the climb wind page, unless a temporary flight plan exists. If this is case, the scratchpad displays “TEMPORARY F-PLN EXISTS”.
[6R] TROPO (blue)	The default tropopause altitude is 36090 feet. The pilot can use this field to modify the altitude (60000 feet maximum).

ROUTE SELECTION PAGE

This page displays all the company routes, stored in the database, that are associated with the inserted city pair. They can either be called up manually, or displayed automatically.

- Manually : The pilot presses the FROM/TO or ALTN key on the INIT A page when a city pair is displayed.
- Automatically : The system displays it, when the pilot enters a city pair or defines an alternate on the INIT A page of the active or secondary flight plan.

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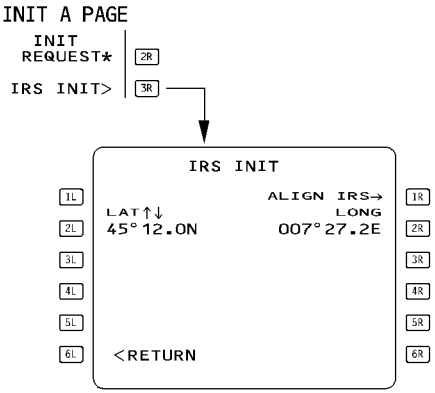


	TITLE	Idents for the city pair inserted on the INIT A page. (The numbers in the upper right-hand corner are the total number of company routes from this city pair stored in the database).
	[1L]	This field shows the name of the company route. “NONE” appears, if there is no company route for this city pair.
	Line 2 to Line 5	These fields display the various elements of the company route : Waypoints appear in large green font, and airways in small white font.
R	[6L] RETURN	The pilot presses this key to return to the INIT A page.
R	[6R] INSERT or SELECT	This prompt displays an amber INSERT (blue for the secondary flight plan), if the pilot accessed the page from the INIT A (or secondary INIT A) page. It displays SELECT (blue) if the crew accessed the page from the alternate page. The pilot presses this key to insert the displayed company route in the respective flight plan and to return the display to the accessing page.

Note : The pilot can scroll to display the rest of the route (if one page does not show it all), or other company routes for this city pair.

IRS INIT PAGE

The flight crew uses the IRS INIT page to align the inertial reference system. The crew accesses this page, by pressing the IRS INIT key on the INIT A page.



NFCS-04-0328-007-A102AA

[2L] LAT (blue) — This field displays the latitude of the reference point of the departure airport. The crew can modify the altitude by slewing or overwriting it.

[6L] RETURN — This prompt enables the crew to return to the INIT A page.

[1R] ALIGN IRS (amber) — This field only displays this legend, if the LAT and LONG fields are filled in, and at least one of the inertial reference systems is in ALIGN status (IRS selectors in NAV position, and the alignment process not completed). When the crew presses the "ALIGN IRS →" prompt, the coordinates displayed in the LAT and LONG fields are sent to the IRSs. This completes the alignment process. If one of the three IRSs indicates an ALIGN FAULT occurence, the prompt becomes REALIGN IRS.

[2R] LONG (blue) — This field displays the longitude of the reference point of the departure airport. The crew can modify it by slewing, or overwriting.

WIND PAGES

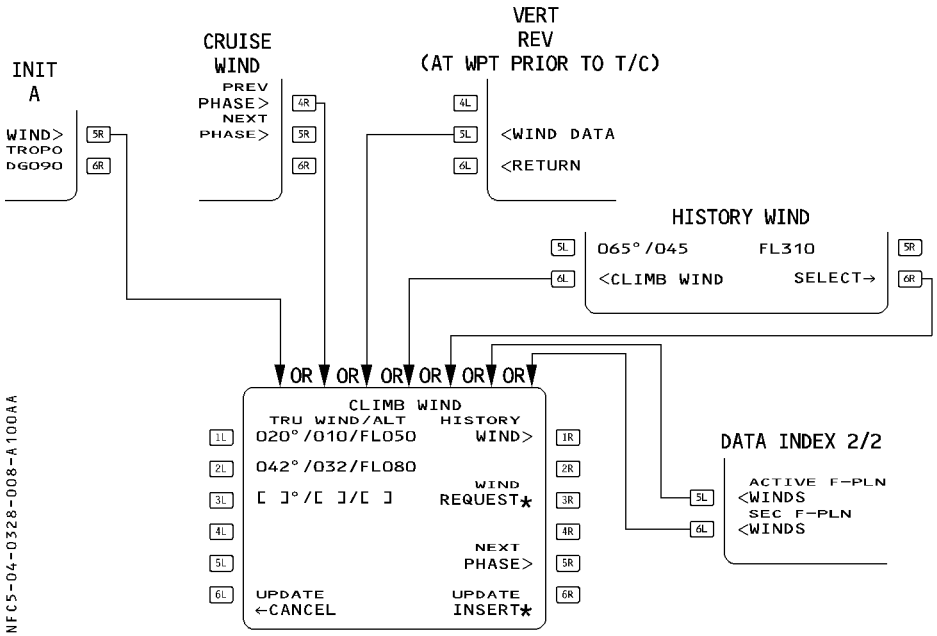
Winds in climb, cruise, descent, and approach are necessary to provide the pilot with reliable predictions and performance. Wind pages enable the pilot to enter and/or review the winds propagated by the FMGS or sent by ACARS for the various flight phases.

Note : On the WIND pages, wind direction is always true-referenced.

CLIMB WIND PAGE

This page enables the pilot to enter and/or review predicted wind vectors (direction and velocity) at up to 5 different levels.

R The CLIMB WIND page is accessed from :

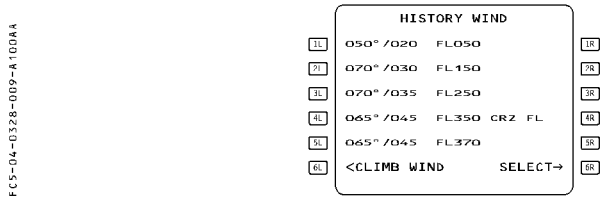


TITLE	"CLIMB WIND" is displayed in large white font.
[1L] TRU WIND/ALT to [5L]	This field displays the winds, entered at various climb altitudes : In blue, before climb phase activation, and in green, after climb phase activation. This field may also display history winds or uplink winds. Large blue brackets are displayed before any wind entry. Pilot-entered and uplinked winds are displayed in large font. History wind data is displayed in small font. Upon sequencing the top of climb, the climb winds are deleted.
[6L] RETURN or UPDATE CANCEL	The RETURN prompt is displayed, when no wind entry is performed. Selecting this prompt reverts to the access page. The UPDATE CANCEL prompt appears, as soon as a wind entry is performed. It is used to cancel a wind data update.

Note : Climb winds are not deleted, when the origin airport is changed.

[1R] HISTORY WIND	This key calls up the history wind page and is only displayed in the preflight phase. It cannot be modified (small, green font), but can be inserted into the CLIMB WIND page by using the 6R key and modified accordingly.
[3R] WIND REQUEST	Pressing this key sends a request for ACARS winds. (Refer to 4.04.40).
[5R] NEXT PHASE	Pressing this key calls up the CRUISE WIND page, or the DESCENT WIND page, if no cruise waypoint exists.
[6R] UPDATE INSERT	This prompt is displayed, as soon as a wind entry or a modification is performed. When it is pressed, the page reverts to the F-PLN A page. Pressing the up (down) scroll key will display the data at the next (previous) downpath (up path) descent waypoint.

HISTORY WIND PAGE

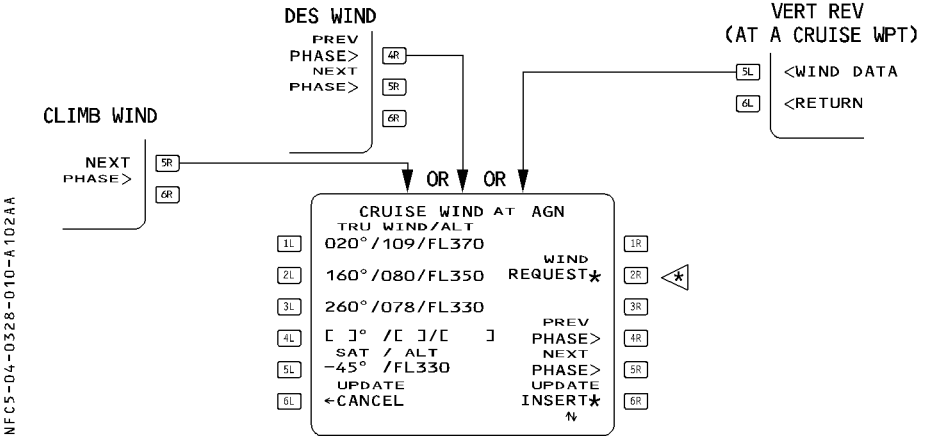


NFCS-04-0328-009-A100AA

[1L] to [5L]	The history winds are given for the default altitudes of FL050, FL150, FL250 and the CRZ FL of the previous flight.
[6L] CLIMB WIND	This key reverts the display to the CLIMB WIND page.
[6R] SELECT	This key inserts the history wind values into the CLIMB WIND page. This prompt is displayed, if no wind has been inserted yet.

CRUISE WIND PAGE

The CRUISE WIND page allows the entry and display of predicted wind data (direction and velocity) for each cruise waypoint.
The CRUISE WIND page also enables the definition of a temperature at a given altitude to refine the predicted temperature profile. It is accessed from the CLIMB or DESCENT WIND page, or by pressing the WIND DATA prompt on the VERT REV page of a cruise waypoint.
The flight crew can enter wind data for each cruise waypoint at up to four different altitudes.



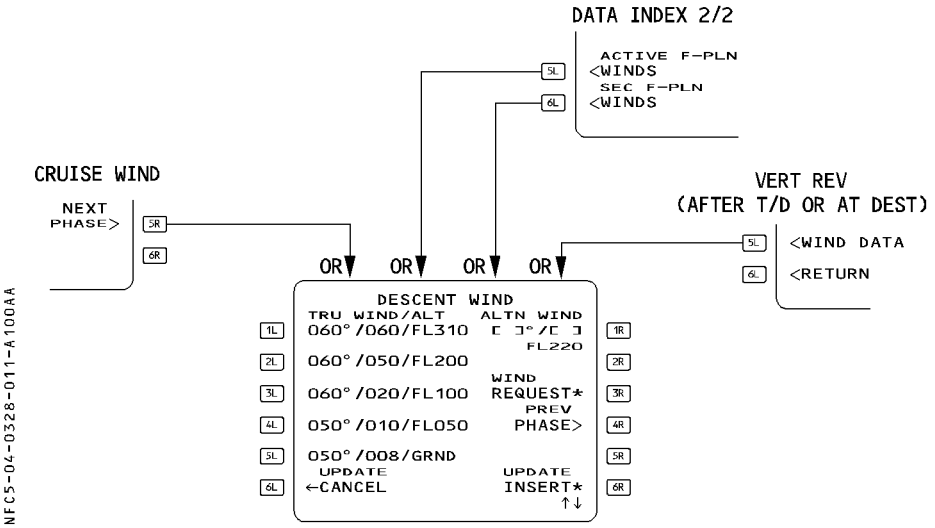
[1L] TRU WIND/ALT to [4L] (blue)	These fields display the entered wind at various altitudes. The entered winds are propagated at the same altitude to the downpath cruise waypoints, if no other winds are entered. The propagated wind direction and velocity are displayed in small font. Both the uplinked winds and the pilot-entered winds are displayed in large font. Wind data can be modified during cruise.
[5L] SAT/ALT (blue)	This field enables the crew to enter a temperature at a given flight level, or it displays a propagated value. The flight crew must enter both temperature and altitude at the first entry. They can then modify the temperature or the altitude independently.

[6L]	UPDATE CANCEL or RETURN : The "< RETURN" prompt is displayed when no modification has been performed on any WIND page. Selecting this prompt reverts to the page from which WIND pages have been accessed when modifications have been performed on any WIND page, the "UPDATE CANCEL" prompt is displayed. Selecting this prompt cancels all modifications to the WIND pages.
[2R] WIND REQUEST ◁	Pressing this key sends a request for ACARS winds. (Refer to 4.04.40)
[4R] PREV PHASE	This prompt is displayed in Preflight, Takeoff, Climb and Done phases. Pressing this prompt calls up the CLIMB WIND page.
[5R] NEXT PHASE	Pressing this prompt calls up the DES WIND page. Any new entry performed on the CRUISE WIND page is immediately inserted into the corresponding flight plan. Predictions are dashed on the F-PLN pages during the recomputation time. CRUISE WIND page automatically reverts to F-PLN page, if a temporary flight plan is created or the secondary flight plan is activated.
[6R] UPDATE INSERT*	This prompt is displayed when modifications have been performed on any WIND page. Selecting this prompt inserts all the modifications performed on the WIND pages. The display reverts to F-PLN A page.

DESCENT WIND PAGE

This page enables the pilot to define and display the winds used for computing the descent profile at up to 5 descent altitudes.
The pilot calls it up by selecting NEXT PHASE on the CRUISE WIND page, or the WIND prompt on the VERT REV page.

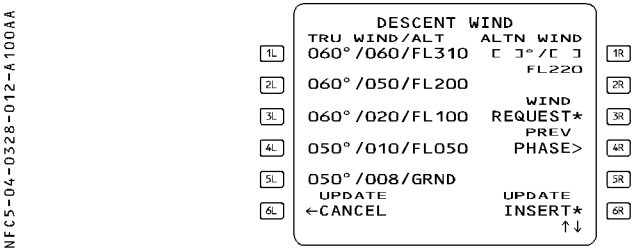
R



[1L] to [5L]
These lines display inserted winds or uplinked winds : In large blue fonts, prior to activating the descent phase (modifiable values), and in green after descent phase activation (not modifiable values).
An entry of "GRND" in the "ALT" field is seen as the wind at ground level. This wind is copied on to the PERF APPR page (and corrected for the magnetic variation), and used for the computation of the predictions.
A clear action on one key reverts the line to blue brackets.

[6L] RETURN or UPDATE CANCEL
The RETURN prompt is displayed, when no wind entry is performed. Selecting this prompt reverts to the access page.
The UPDATE CANCEL prompt appears, as soon as a wind entry is performed. It is used to cancel a wind data update.

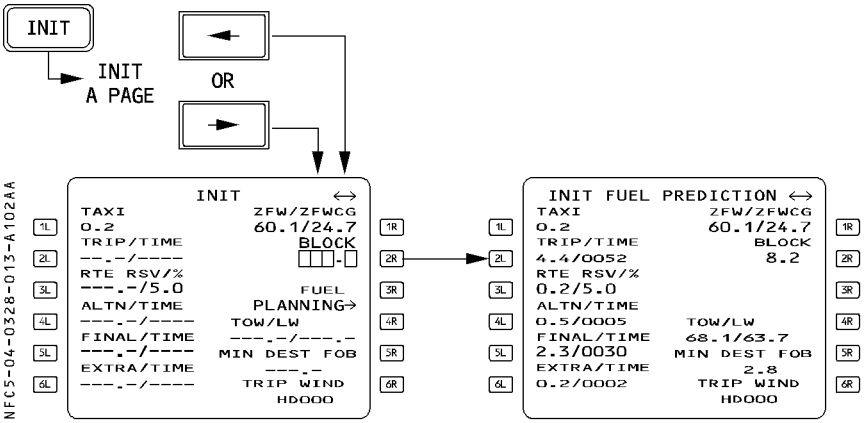
Note : Descent and alternate winds are deleted, if the destination airport is changed.



[1R] ALTN WIND	This field is only displayed when an alternate is defined. The pilot-entered or uplinked value is displayed in large blue font. It can always be modified by the pilot.
(2R] FLXXX	This field displays an uplinked alternate cruise altitude in the label line. If no uplink is done, this field displays the FMS alternate cruise flight level in small green font.
[3R] WIND REQUEST	Pressing this key sends a request for ACARS winds (refer to 4.04.40).
[4R] PREV PHASE	Pressing this key calls up the CRUISE WIND page. The prompt is erased after the top of descent is sequenced.
[6R] UPDATE INSERT	This prompt is displayed, as soon as a wind entry or a modification is performed. When it is pressed, the page reverts to the F-PLN A page. Pressing the up (down) scroll key will display the data at the next (previous) downpath (up path) descent waypoint.

INIT B PAGE

This page is used to initialize the gross weight and center of gravity values, before starting the engines.
The crew can call it up from the INIT A page, by pressing the "→" or "←" key on the MCDU, as long as the engines have not been started.
This page automatically reverts to the FUEL PRED page, after the first engine is started.
The FMGC computes its predictions based on the FOB indicated by the FQI computer (or the FAC as backup) from that moment on.



[1L] TAXI (blue) — This is the taxi fuel, that defaults to a preset value, (usually 200 kg). The crew can change the value through this field.

[2L] TRIP/TIME (green) — This field displays the trip fuel and time when predictions are available.
The crew cannot modify these values.

[3L] RTE RSV/% (blue) — This field displays the reserve fuel for the route and the corresponding percentage of trip fuel. It may be blank, if such is the policy of the operator. The crew can either enter a route reserve, or a percentage, and the system then automatically computes the nominal value.

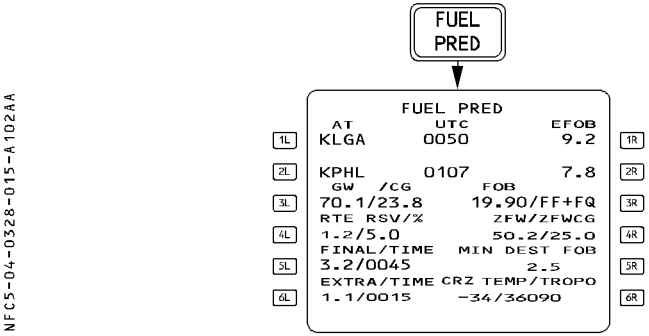
[4L] ALTN/TIME (green)	Displays alternate trip fuel and time, assuming that the Cost Index = 0 and that the aircraft flies at the default cruise flight level. (Refer to "PREDICTED DATA FOR ALTERNATE" 4.04.18 p 25). This field displays this information in small font, and it cannot be modified by the flight crew.
[5L] FINAL/TIME (blue)	Displays the hold fuel and time, associated with continued flight to the alternate airport (or destination airport, if selected in the "airline fuel policy" section of the database). The flight crew may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes that the holding will be in a racetract pattern, 1500 feet above the alternate airport, for 30 minutes, with the aircraft in CONF1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the "airline fuel policy" section of the database).
[6L] EXTRA/TIME (green)	Displays the amount of extra fuel, and the available time it represents for holding over the alternate or primary destination, if the crew did not define an alternate. EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + ALTN + FINAL) The field displays its information in small font, and it cannot be modified by the flight crew.
[1R] ZFW/ZFWCG (blue)	Displays the Zero Fuel Weight (ZFW) and Zero Fuel Weight CG (ZFWCG). These values must be entered to allow the system to compute speed management predictions.
[2R] BLOCK	The block fuel in this field is a mandatory entry, that enables the system to predict the Estimated Fuel On Board (EFOB). When the flight crew enters a block fuel, the page title changes to INIT FUEL PREDICTION.

Note : If the flight crew enters a value in the 1R or 2R field that exceeds the acceptable range, the "ENTRY OUT OF RANGE" message appears and the value is rejected.

[3R] FUEL PLANNING (amber)	Initiates an FMGC block fuel computation. When the pilot selects this function, FUEL PLANNING becomes green, and the BLOCK field is dashed during FMGC computation. The title of the page changes to INIT FUEL PLANNING, and BLOCK CONFIRM* replaces the FUEL PLANNING prompt, when the block fuel is computed by the FMGC. If the pilot modifies the parameters used to compute prediction before confirmation, the computation automatically restarts and FUEL PLANNING is displayed in green.
[4R] TOW/LW (green)	Displays the computed Takeoff Weight (TOW) and Landing Weight (LW) at the primary destination. This cannot be modified.
[5R] MIN DEST FOB (green)	Displays the minimum fuel at destination. It enables the crew to specify a minimum FOB value required at destination. By default, it is equal to the FINAL + ALTN fuel. This field cannot be modifed.
[6R] TRIP WIND (blue)	This field allows the entry of a mean wind component for the trip from the primary origin to the primary destination. Upon entry of a CO RTE or FROM/TO pair, this field defaults to HD 000 in small font. An entry preceeded by –, H, HD is considered to be headwind, +, T, TL to be tailwind. The entered velocity is displayed in large blue font. When the flight crew inserts a wind on the CLIMB, CRUISE or DESCENT WIND page, the system no longer considers the trip wind.

FUEL PRED PAGE

The FUEL PRED page displays fuel prediction information at destination and alternate, as well as fuel management data after the engines are started. The flight crew accesses the FUEL PRED page, by pressing the FUEL PRED key on the MCDU.



[1L] – [1R] AT/UTC–TIME/EFOB (green)
Display time and fuel predictions to the primary destination. TIME is displayed before takeoff. UTC predictions are displayed after takeoff. If the flight crew has entered an Estimated Takeoff Time (ETT), the UTC is displayed.
The EFOB at destination will turn to amber, if it becomes less than the MIN DEST FOB value.

[2L] – [2R] AT/UTC–TIME/EFOB
These lines display time and fuel predictions to the alternate airport. (Ref. FCOM 4.04.18).

[3L] GW/CG (blue)
The FMS continuously updates the Gross Weight (GW) and Center of Gravity (CG) during the flight. If, at engine start, no ZFW or ZFWCG have been entered, amber boxes are displayed in the corresponding field. The flight crew must enter the ZFW/ZFWCG values (as appropriate) to obtain a speed profile and predictions. The field displays dashes, as long as the system is not calculating the Fuel On Board.
The flight crew can modify both the GW and the CG values.

[4L] RTE RSV/% (blue)
Before departure, this field displays the route reserve fuel and the corresponding percentage of trip fuel. After takeoff, it displays the percentage of the remaining trip fuel from the present position to the destination. The field may be blank, depending on the fuel policy of the airline. The flight crew can enter either a RTE RSV or a RTE RSV percentage. The system automatically computes the other value.

[5L] FINAL/TIME (blue)	Displays the hold fuel and time, associated with continued flight to the alternate airport (or destination airport, if selected in the "airline fuel policy" section of the database). The flight crew may enter a final fuel or time, and the system will compute associated holding time/fuel available. The system assumes that the holding will be in a racetrack pattern, 1500 feet above the alternate airport, for 30 minutes, with the aircraft in CONF1 at maximum endurance speed (racetrack pattern, altitude and selected airport can be modified through the "airline fuel policy" section of the database).
[6L] EXTRA/TIME (green)	Displays the amount of extra fuel, and the resulting time available for holding over the primary destination. EXTRA FUEL = BLOCK – (TAXI + TRIP + RSV + ALTN + FINAL). This field displays its information in small green font, and it cannot be modified by the flight crew.
[3R] FOB (green)	Displays the Fuel On Board (FOB) calculated by the FMGS, as well as the sensors used to calculate the FOB, that can be : – Fuel flow and fuel quantity sensors (/FF+FQ) – Fuel flow sensors only (/FF) – Fuel quantity sensors only (/FQ). The flight crew can modify the FOB value in flight, or modify the sensors used by entering "/FF", "/FQ" or "/FF+FQ", as required.
[4R] ZFW/ZFWCG (blue)	Displays the Zero Fuel Weight (ZFW) and Zero Fuel Weight Center of Gravity (ZFWCG) values, as entered before engine start on the INIT B page. The flight crew can re-enter or modify these values after engine start on the FUEL PRED page. If at engine start, no ZFW or ZFWCG values have been entered, amber boxes are displayed in the corresponding field. The flight crew must enter the ZFW/ZFWCG values (as appropriate) to obtain a speed profile and predictions.
[5R] MIN DEST FOB (green)	Displays the Minimum Fuel at Destination. It allows the flight crew to specify a minimum FOB value required at destination. By default, it is equal to the FINAL + ALTN fuel. This field cannot be modified.
[6R] CRZ TEMP/TROPO (blue)	Displays the temperature at the cruise flight level, and the altitude of the tropopause. The flight crew can modify both values. This field is dashed, when the aircraft sequences the top of climb.

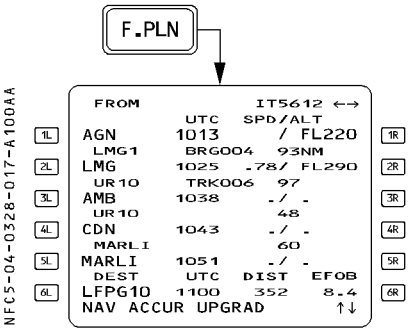
Note : All fields, except [6R], are dashed before engines are started.

FLIGHT PLAN PAGES

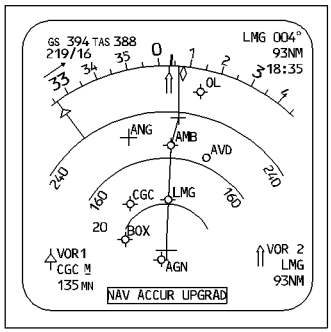
These pages display all active and alternate flight plan, waypoints alongwith the associated predictions.
The pilot can make all revisions to the lateral and vertical flight plans from these pages: He presses the left key to revise the lateral flight plan, and the right key to revise the vertical flight plan.
He presses the F-PLN key on the MCDU console to access page A of the active flight plan.

FLIGHT PLAN A PAGE

Page A displays time, speed, and altitude predictions for each active flight plan waypoint.



CORRESPONDING ND



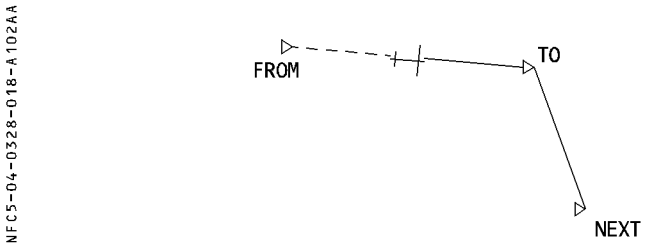
TITLE	FLIGHT NUMBER (blank, if no flight number has been entered). This line may display OFST in white, if a lateral offset is flown.
Line 1 to Line 5 WPT, UTC, SPD, ALT	These lines display consecutive waypoints, alongwith associated predictions of time, speed or Mach and altitude for each. TIME is displayed before takeoff, and UTC after takeoff. After the pilot enters an Estimated Takeoff Time (ETT), UTC is displayed. The time and flight level display at the FROM waypoint (first line of the flight plan) are values that the system memorized at waypoint sequencing.
[1R] SPD/ALT	The field dedicated to SPEED or MACH is blank at the FROM waypoint, except at the departure airport. (V1 associated with runway elevation, is displayed).

Note : When the HOLD marker is slewed, the HOLD SPD label will overwrite the TIME/UTC title. In addition, the IMM EXIT or RESUME HOLD prompt will replace the SPD/ALT field.

Line 6,
DEST UTC/TIME
DIST, EFOB

DIST is the distance to destination along the displayed flight plan. EFOB is the estimated fuel on board at destination. The EFOB at destination will turn to amber, if it becomes less than the MIN DEST FOB value.
The sixth line is permanent and is displayed in white font, once predictions are available, except when a TMPY F-PLN is displayed, or in some cases when an ALT CSTR is entered ("← CLB or DES →" prompt appears).

Note : The predicted altitude at a waypoint is related to the QNH below the transition altitude, and is given as a flight level above the transition altitude.



The generic flight plan page displays the FROM waypoint (last waypoint to be overflown) on the first line, and the TO waypoint (in white) on the second line. The FROM/TO flight plan leg is called the active leg.
The flight crew can use the scroll keys to review all flight plan legs down to the last point of the alternate flight plan. The AIRPORT key serves as a fast scroll key. The pilot can press it to call up the next airport (DEST, ALTN, ORIGIN) to be displayed on the flight plan page.
In order to return to the beginning of the flight plan page, the pilot presses the F-PLN key on the MCDU console.
The display shows the name of the leg between two waypoints, and the distance between them on a line between the lines that identify them. During an approach, this in-between line also defines the angle of the final descent path. For example, "2-3°" indicates that the leg is two nautical miles long, and the flight path angle is –3°.
The display shows the bearing between FROM and TO waypoints as the bearing from the aircraft position to the TO waypoint. It shows track (TRK) between the waypoints shown in lines 2 and 3. This is the outbound track of the next leg.
If the database contains a published missed approach procedure, or if someone has inserted one manually, the display shows it in blue after the destination runway identification. It turns green when the go-around phase becomes active.
After the last waypoint of the missed approach, the display shows the alternate flight plan in NAV mode.
When NAV mode is engaged, the flight crew can only clear or modify the TO waypoint by using the DIR key on the MCDU console.

Predictions

The FMS calculates and displays predictions at all F-PLN waypoints.
It uses the current wind and the predicted winds to compute the predictions.

Constraints

The database can define an altitude constraint and speed constraint for each waypoint of the climb, descent, and approach phases, or the flight crew can manually insert such constraints (except at origin, destination, FROM, and pseudo-waypoints).
The constraints are displayed in magenta, until the predictions are completed.
When the predictions are available, the constraints are replaced by speed and altitude predictions preceded by stars. If the star is in magenta, the system predicts that the aircraft will match the constraint (altitude within 250 feet, speed not more than 10 knots above the constraints). If the star is in amber, the system predicts that the aircraft will miss the constraint, and the MCDU displays "SPD ERROR AT WPT".

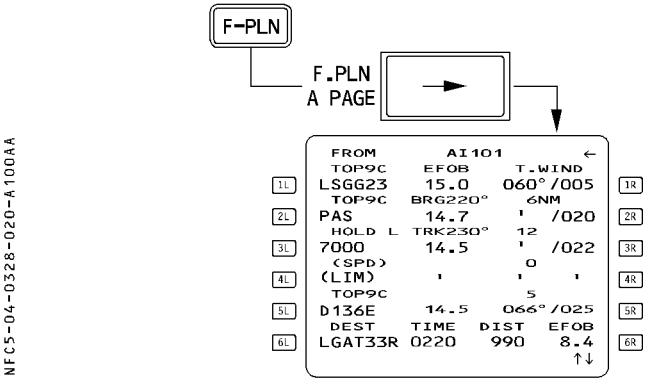
Note : SPD and ALT CSTR can either be entered from the VERT REV page, or directly on the F-PLN A page. Time constraints can only be entered on the RTA page.

Pseudo-waypoints

Pseudo-waypoints are geographical positions corresponding to an event in the flight plan: T/C (Top of Climb), T/D (Top of Descent), SPD/LIM (Speed Limit), S/C (Step Climb point), S/D (Step Descent point), DECEL (Deceleration for Approach), Time Markers etc. Pseudo-waypoints are displayed as waypoints in parentheses.

FLIGHT PLAN B PAGE

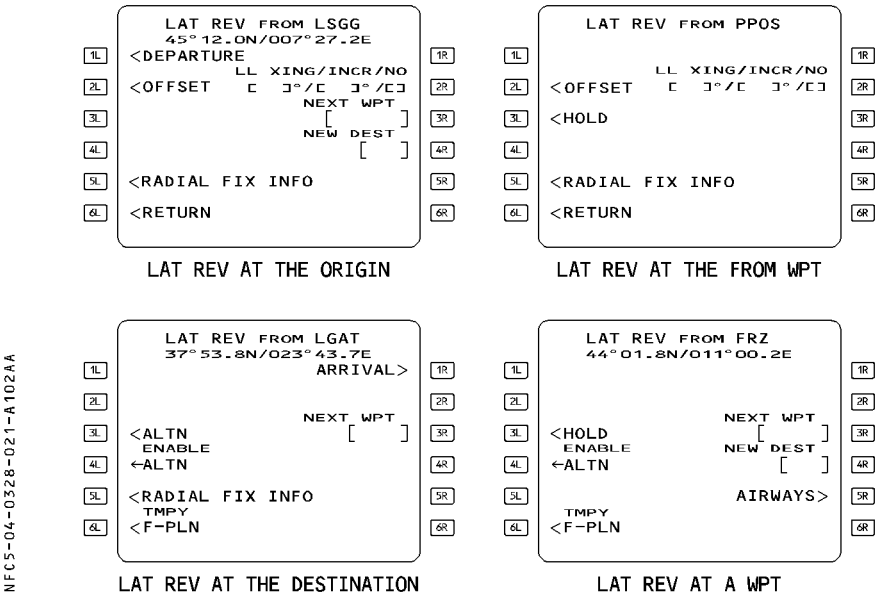
This page displays fuel predictions and forecast winds at each waypoint.
The pilot calls it up by pressing the "→" or "←" keys when the FLIGHT PLAN A page is displayed.



TITLE	FLIGHT NUMBER (blank, if no flight number has been entered).
Line 1 WPT-EFOB-WIND to Line 5	These lines display consecutive waypoints and associated fuel predictions, and the predicted wind profile. The direction of forecast winds is relative to true north. Forecast winds include winds entered by the pilot (large font) and the propagated winds at intermediate waypoints (small font). EFOB and WIND at the FROM waypoint are displayed in large font. At other waypoints, it is displayed in small font, and in the same color as the associated waypoint. No wind entry is allowed on this page. The pilot will use the CLIMB, CRUISE, or DESCENT WIND pages, accessed from the INIT A page or the DATA INDEX B page.
Line 6 DEST-UTC/DIST-EFOB	Identical to the F-PLN A page.

LATERAL REVISION PAGES

These pages provide a list of the lateral flight plan revisions, that can be used to change the flight plan beyond a selected waypoint.
The crew calls up these pages from the Flight Plan pages (A or B), by pressing the left key next to the selected waypoint.
Different lateral flight plan revisions are available for different waypoints.



NFCS-04-0328-021-A102AA

TITLE — The ident of the waypoint or airport selected for revision, together with its latitude and longitude.
If the selected waypoint is the FROM waypoint, the title omits the aircraft latitude and longitude, and instead displays the "PPOS" (present position).

[1L] DEPARTURE — This prompt gives access to the DEPARTURE pages, where the crew can select and insert runways, SIDs, and TRANSs.

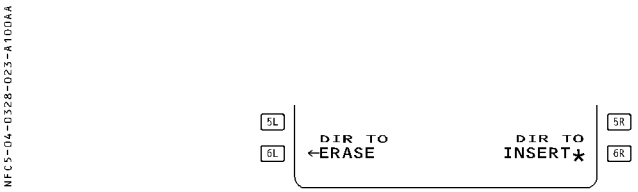
[2L] OFFSET [ ] — This prompt allows the crew to enter a left or right lateral offset in the flight plan.
The offset can be between 1 and 50 NM.
When the crew enters an offset, the OFFSET field becomes yellow, and the 6L and 6R fields display "ERASE" and "INSERT". The crew can delete an inserted offset by pressing the CLR pushbutton, by entering a zero for the amount of the offset, or by selecting a DIR TO.

[3L] HOLD or [3L] ALTN	This prompt gives access to the hold pages. This prompt is only available if the revised point is the destination airport. It enables the crew to access the alternate airport page.
[4L] ENABLE ALTN	The crew presses this key to create a temporary flight plan using the alternate flight plan that is defined, but not inserted. This prompt is not displayed at the ORIGIN and FROM waypoints.
[5L] RADIAL FIX INFO	This field is only displayed on the lateral revision at the origin, destination or FROM waypoint. It gives access to the RADIAL FIX INFO pages.
[6L] TMPY F-PLN (yellow) or RETURN (white)	Pressing this key gives access to the temporary flight plan (when created). (No temporary flight plan exists). This prompt gives access to the last displayed F-PLN page.
[1R] ARRIVAL	The crew uses this prompt to call up the arrival pages, where RWY, APPR, STAR TRANS and VIA can be selected and inserted.
[2R] LL XING/INCR/NO (blue)	This field allows the crew to create latitude/longitude crossing points. The increment (INCR) ranges from 1 to 20 degrees, and the number of crossing points (from 1 to 99). This field is in yellow when a temporary flight plan exists.
[3R] NEXT WPT (blue)	The crew presses this key to enter the next waypoint. This prompt is not displayed at the FROM (or PPOS) waypoint. This field is in yellow when a temporary flight plan exists.
[4R] NEW DEST (blue)	The system displays this prompt for the flight crew to enter a new destination. It is not displayed at the FROM (or PPOS) waypoint, at waypoints beyond the destination, or at destination. When the missed approach becomes active, the prompt is available at any point of the missed approach. This field is in yellow when a temporary flight plan exists.
[5R] AIRWAYS	The crew presses this key to insert an airway between the revised waypoint and another waypoint. This prompt is not displayed at the FROM waypoint, origin or destination, and on manually-created waypoints.

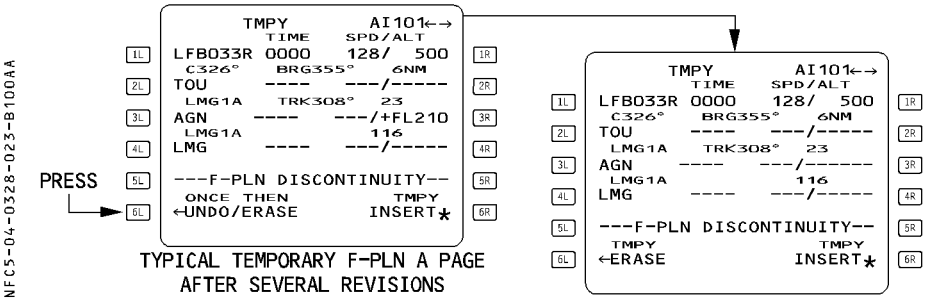
TEMPORARY REVISION

R When the pilot selects a lateral or vertical revision, the system creates a "Temporary F-PLN" and displays it in yellow on the MCDU, and as a dashed yellow line on the ND to enable the pilot to review the data before inserting. As long as the temporary flight plan is not inserted, the previous flight plan remains active and the system guides the aircraft along. The pilot can perform multiple revisions in the same temporary flight plan.
The temporary flight plan does not display destination information on 6L, but displays fields to erase or insert the temporary revision :

- DIR TO ERASE : Deletes the temporary flight plan when a DIR TO revision is performed.
- DIR TO INSERT : activates the temporary flight plan when a DIR TO revision is performed.



- ONCE UNDO/THEN ERASE : Cancels the last revision in the temporary flight plan.
- TMPY INSERT : Activates the temporary flight plan.
- TMPY ERASE : Deletes the entire temporary flight plan.

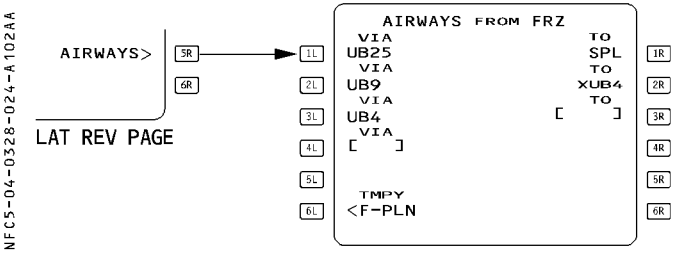


TYPICAL TEMPORARY F-PLN A PAGE
AFTER SEVERAL REVISIONS

Note : The destination information is still available by scrolling up to the end of the flight plan or by using the AIRPORT key.

AIRWAYS PAGE

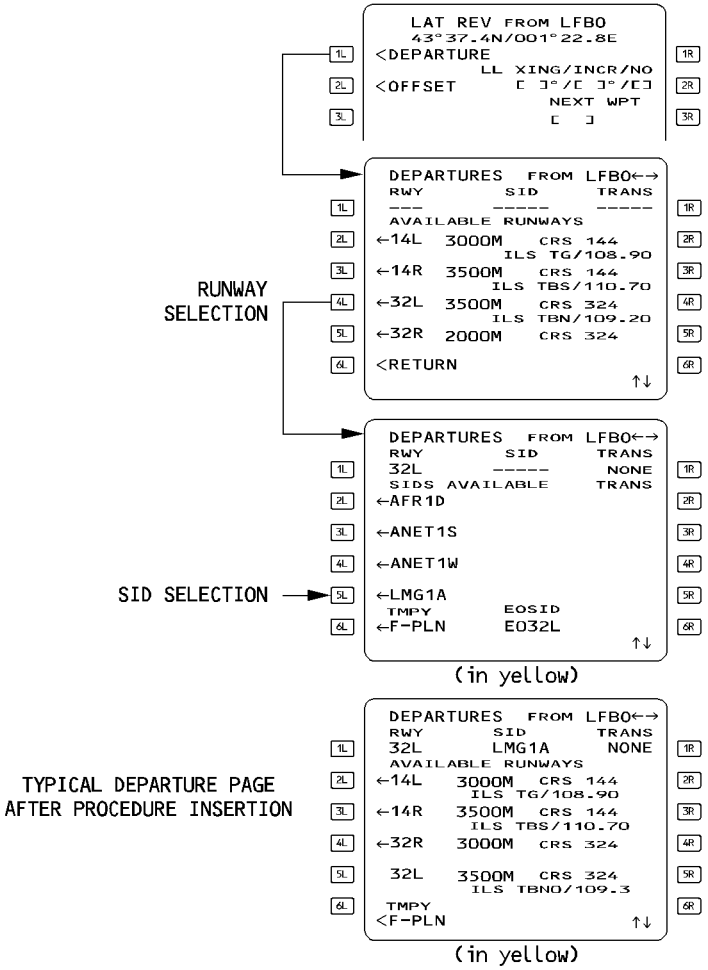
The flight crew can use the AIRWAYS page to select up to five airways, and string them into the flight plan, after the revised waypoint.
The crew calls up this page, by pressing the AIRWAYS key (5R) on the LAT REV page.



TITLE	"AIRWAYS from XXX", XXX : Revised waypoint ident (large green font).
[1L] VIA to [5L]	Displays the airways entered by the crew.
[6L] TMPY F-PLN or RETURN	The flight crew presses this key to return to the lateral revision page. This field displays TMPY F-PLN when a temporary flight plan is created. It enables the temporary flight plan to be consulted.
[1R] TO to [5R]	Displays the end point of the corresponding airways entered on the [1L] to [5L] entries. The ending point is displayed in large blue font, if manually-entered, in small blue font, if computed by the FMGC.

DEPARTURE PAGES

The flight crew can use the DEPARTURE pages to review departure procedures (RWY, SID, TRANS), and enter them into the temporary flight plan.
When the display shows the lateral revision page for the origin, the flight crew calls it up, by pressing the 1L key.
The RWY, and, SIDS/enroute TRANS (if any) pages are available.
The flight crew sequentially calls up the SIDs and TRANS (if any) pages by selecting a runway on the RWY page. The flight crew can also scroll between the RWY, SIDs and TRANS (if any) pages by pressing the "← " or "→ " key on the MCDU console.



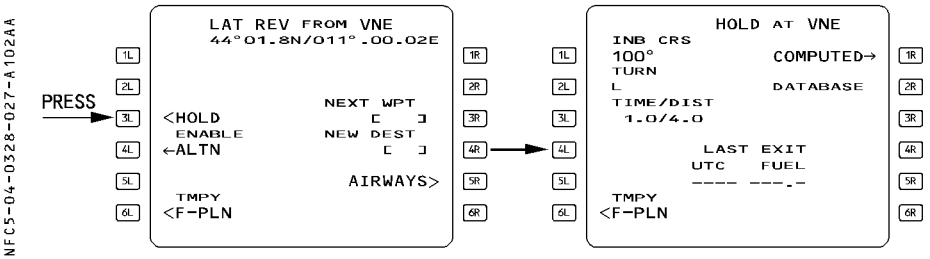
TYPICAL DEPARTURE PAGE
AFTER PROCEDURE INSERTION

NFC5-04-0328-025-A102AA

Line 1 RWY, SID TRANS	This line displays the RWY, SID, and TRANS in green after they have been inserted into the active flight plan, or in yellow if a temporary is created or updated. If nothing has been selected or inserted, the line displays dashes. “NONE” is displayed in the SID or TRANS field, if no SID or TRANS exists, or NO SID or NO TRANS was selected by the crew.
[2L] RWY/SIDs to [5L]	These fields display selectable and selected RWYs or SIDs. The pilot can scroll each list. Selectable RWYs and SIDs are displayed in blue with an arrow. Once a RWY or SID is selected, the arrow disappears. A RWY or SID, already inserted in the flight plan, is displayed in green. When a runway is selected, a temporary is created or modified, and the DEPARTURE page 2 for SID selection is automatically displayed. The display shows the length, course and, if available, the ILS ident and frequency for each runway.
[6L] TMPY F-PLN or RETURN	The pilot presses this key to return to the temporary flight plan page, if a temporary exists. The display shows RETURN, instead TMPY F-PLN, when the pilot has not created a temporary flight plan. Pressing this key reverts to the LAT REV page.
[2R] TRANS to [5R]	This field displays the selectable and selected enroute transitions in blue and green respectively. They are blank, if there are no transitions. When a TRANS is selected, a temporary is created or updated (if one already exists).
[6M] EOSID	Once a runway is inserted into the flight plan, this field displays any ENG OUT SID for that runway. If a temporary is created or updated, the EOSID is displayed in yellow. Otherwise, it is displayed in green. If there is none, it displays “NONE”.

HOLD PAGES

These pages allow the pilot to review and modify the holding pattern parameters at the selected revise waypoint. The holding pattern data may come from the database, or may be defaulted to standard dimensions.
The pilot calls up these pages by pressing the HOLD key on the LAT REV page for the waypoint. The flight crew can insert database holds, hold computed by the FMS, or manually defined holds.

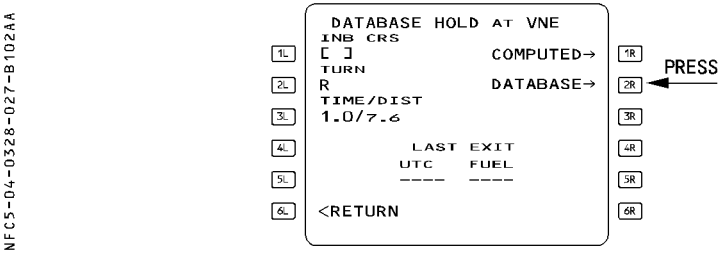


The page title is displayed in white, if no temporary flight plan exists, or in yellow if a temporary flight plan is in progress. Hold parameters, IR and 2R fields are displayed in blue if no Temporary exists, or in yellow if a temporary flight plan is in progress.
At first access, the HOLD page is displayed as follows :

- If a hold can be inserted at the revised waypoint, [1L] displays blue brackets and [2L] and [3L] display in blue the parameters of the FMS computed hold.
- Else, [1L], [2L] and [3L] display in green the parameters of the already existing hold that prevent insertion at the revised waypoint.

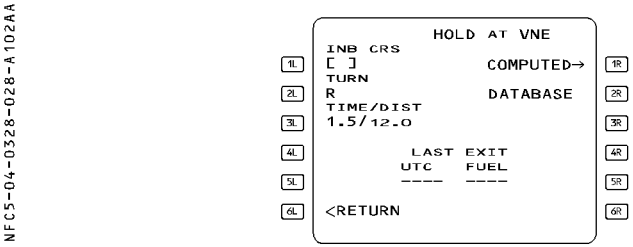
- **DATABASE HOLD AT...**

  If a hold is defined in the navigation database for the revised waypoint, and if this hold has not been inserted yet, an arrow is displayed in the [2R] field next to DATABASE. Then the flight crew can insert this hold in the temporary flight plan by pressing the [2R] key.



- **COMPUTED HOLD**

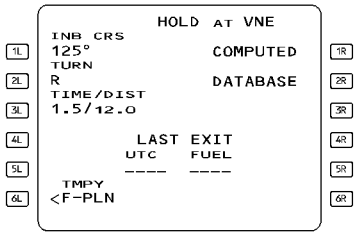
  If a default hold is computed by the FMS, and this hold has not been inserted yet, an arrow is displayed in the [1R] field next to COMPUTED. Then the flight crew can insert this hold in the temporary flight plan by pressing the [1R] key.



NFC5-04-0328-028-A102AA

A computed hold has the following default parameters :
INB CRS = INBD TRK of the F-PLN leg leading to the revised waypoint.
TURN = Turn direction right.
TIME on outbound leg is 1.5 minutes above 14000 feet, 1 minute below 14000 feet.

NFC5-04-0328-029-A102AA



[1L] INB CRS — This field displays the inbound course of the holding pattern. The data may be manually or automatically modified (via COMPUTED or DATABASE prompts).

[2L] TURN — This field shows the direction to turn in the hold (L or R). The data may be modified.

[3L] TIME/DIST — This field shows the time and distance for the outbound leg. The data may be modified, but time and distance cannot be entered simultaneously.
Time and distance are dependent values that the system calculates from the predicted ground speed at the revised point, which in turn depends upon the holding speed (speed for maximum endurance, ICAO speed limit, or constraint speed, whichever is lower).

[6L] TMPY F-PLN or RETURN — This prompt gives access to the temporary flight plan page if one is in progress.
If not, " RETURN" is displayed and allows a return to the LAT REV page.

[1R] COMPUTED (→) — Pressing this key reverts parameters to the system-computed parameters (1L, 2L, 3L).

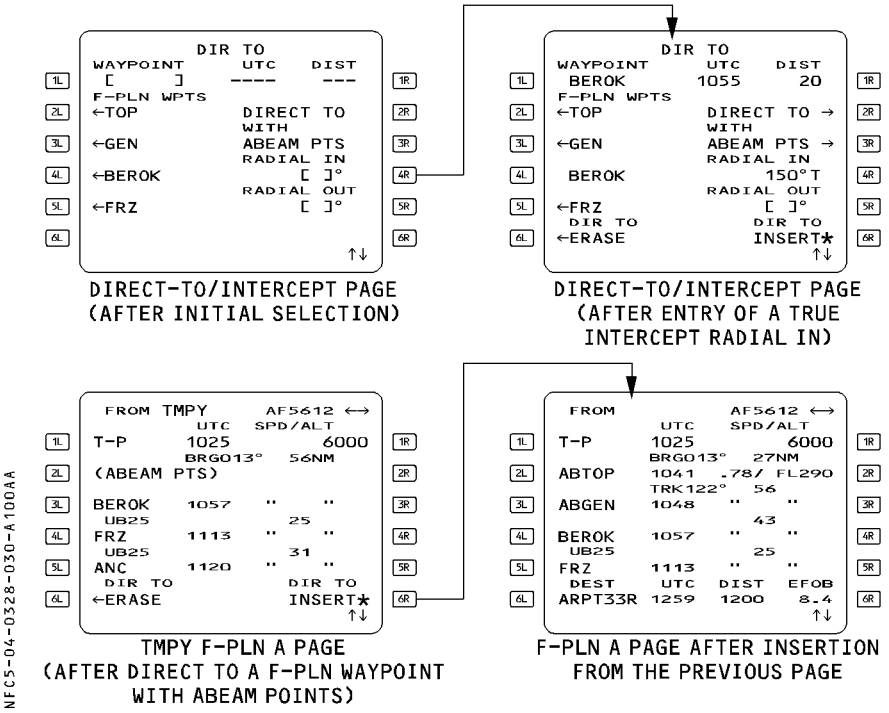
[2R] DATABASE (→) — Pressing this key reverts the displayed parameters to the parameters memorized in the database for this waypoint.

LAST EXIT UTC FUEL — This field displays the time at which the aircraft must leave the holding pattern in order to meet fuel policy criteria (extra fuel = 0). The system also displays the estimated fuel on board at that time.

The 1R and 2R fields, as well as the hold parameters (1L, 2L, 3L) are blue when no temporary flight plan exists, and yellow when a temporary flight plan is in progress.

DIRECT TO PAGE

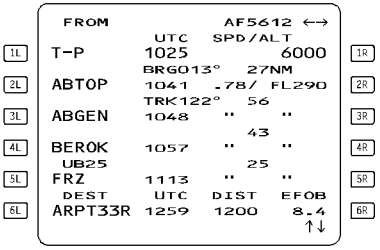
Pressing the "DIR" key from the MCDU screen calls up the DIR TO page. The pilot presses it to modify the flight plan, by creating a direct leg from the aircraft's present position to any selected waypoint. When in NAV mode, the pilot must use this key to modify the active leg or the TO waypoint. The pilot cannot call up this page when the aircraft's present position is invalid. The "A/C POSITION INVALID" message is then displayed.
These are four DIRECT TO/INTERCEPT functions : DIRECT TO, ABEAM PTS, RADIAL IN, RADIAL OUT.
Using the DIRECT TO function results in the creation of a temporary F-PLN.



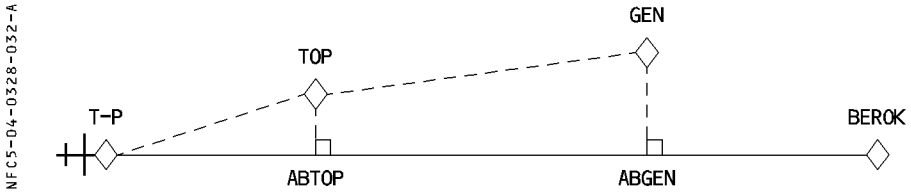
NFC5-04-0328-030-A100AA

[1L] WAYPOINT	This field gives access to the 'Direct To' fix waypoint to be selected from a list of waypoints. The 'Direct To' waypoint may be entered by using its identifier, place/bearing/distance, place-bearing/ place-bearing or latitude/longitude.
[2L] to [5L] F-PLN WPTS	This list provides the waypoints of the active flight plan, except waypoints from the missed approach, pseudo-waypoints F-PLN markers, non fixed waypoints. The display may be scrolled ↑↓ If a temporary flight plan exists, all the waypoints from the list are not selectable.
[6L] DIR TO ERASE	Pressing this key deletes the temporary F-PLN.
[1R] UTC/DIST	As soon as the temporary F-PLN is created, the time and distance to the 'Direct to' fix waypoint is displayed in yellow.
[2R] DIRECT TO	Selecting this key activates the DIRECT TO function in the temporary F-PLN.
[3R] ABEAM PTS	Selecting this key activates the ABEAM PTS function in the temporary F-PLN.
[4R] RADIAL IN and [5R] RADIAL OUT	The pilot fills in these fields to define a radial associated to the waypoint. Selecting a radial in (out) will activate the intercept radial into (from) the specified waypoint in the temporary F-PLN. The pilot enters the radial in, or radial out, as XXX, XXX being the radial. An M or T may also be entered, referring to a Mag or a True value. A default "radial in" is proposed by the FMS if the DIR TO waypoint is part of the F-PLN.
[6R] DIR TO INSERT	Pressing this key enables the temporary F-PLN to be inserted. After insertion, the F-PLN A page is displayed.

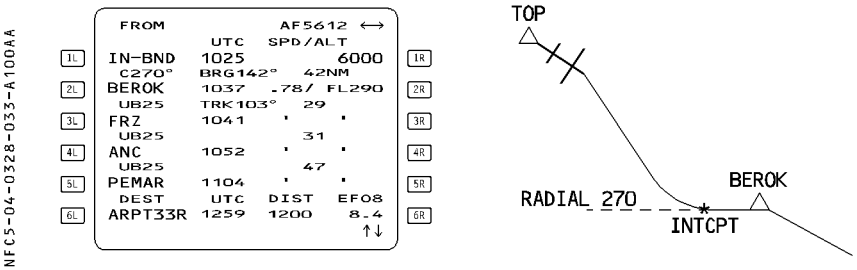
Example 1- DIR TO BEROK - ABEAM



F-PLN A PAGE AFTER ENTRY



Example 2 : RADIAL INBND
DIR TO BEROK - RADIAL 270° INBOUND.

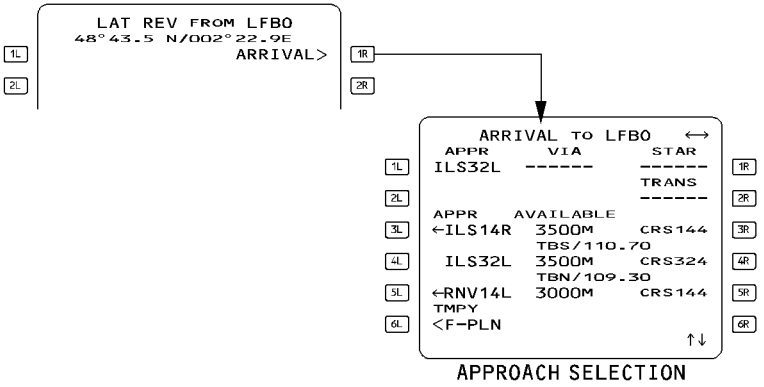


If the DIR TO/INTCPT WPT entry is to a waypoint already in the flight plan, a default RADIAL IN is displayed in small font. However, no radial is displayed on the ND for this default radial. No default radial is provided for the RADIAL OUT field.
Selecting the INTCPT TO (RADIAL IN [1R]) function :
– Activates the intercept radial IN TO the WPT in the temporary F-PLN.
– Sets the course = radial IN + 180°.
Selecting the INTCPT FROM (RADIAL OUT [2R]) function :
– Activates the intercept radial OUT from the WPT.
– Sets the course = radial OUT.
For details, refer to the FCOM 4.04.

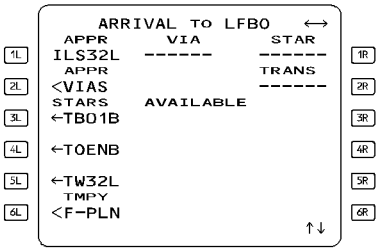
ARRIVAL PAGES

These pages enable the pilot to select a runway with its associated final, and to review arrival procedures (approaches, VIAs, STARs, TRANS) and enter them into the active flight plan.
The pilot calls them up from the LAT REV page for the destination.
Three lists APPR, STAR, and TRANS are available, along with a fourth, APPROACH VIAS if there are any transitions.
The pilot sequentially calls up each page, either by selecting a data item (such as APPR) or by pressing the "→ " or "← " keys on the MCDU console.
When an approach is selected, it is inserted in a temporary fight plan and the ARRIVAL page 2 or APPROACH VIA page is automatically displayed.

Line [1L] - [1R] [2R]	This line displays the APPR, VIA, STAR, and TRANS in green, if they have been inserted in the flight plan, and in yellow, as a temporary flight plan, if they have been selected but not yet inserted. It displays dashes or "NONE", if nothing has been selected or inserted.
[2L] APPR VIAS	The pilot presses this key to call up transitions from the last point of the STAR to the first point of the approach.
[3L] to [5L]	These fields list selectable and selected APPRs, STARs, and VIAs. The flight crew can scroll the pages, when necessary. Selectable APPRs, STARs, and VIAs are displayed in blue with an arrow. Once the pilot has selected an APPR, STAR, or VIA, a temporary F-PLN is created. After the APPR, STAR, or VIA is inserted into the flight plan, it is displayed in green. For each approach, the display shows runway length, heading, and the frequency and identifier of the ILS when ILS is available.
[6L] TMPY F-PLN or RETURN	TMPY F-PLN is displayed to access the temporary F-PLN page corresponding to the last revision. The field displays "RETURN", instead of TMPY F-PLN, when the flight crew has not created a temporary flight plan.
[3R] to [5R]	These fields either display : – The indent and the frequency of the navaid specified for the approach, or – The enroute transitions compatible with the selected STAR. The active selected TRANS is in green, the remaining TRANS are in blue.

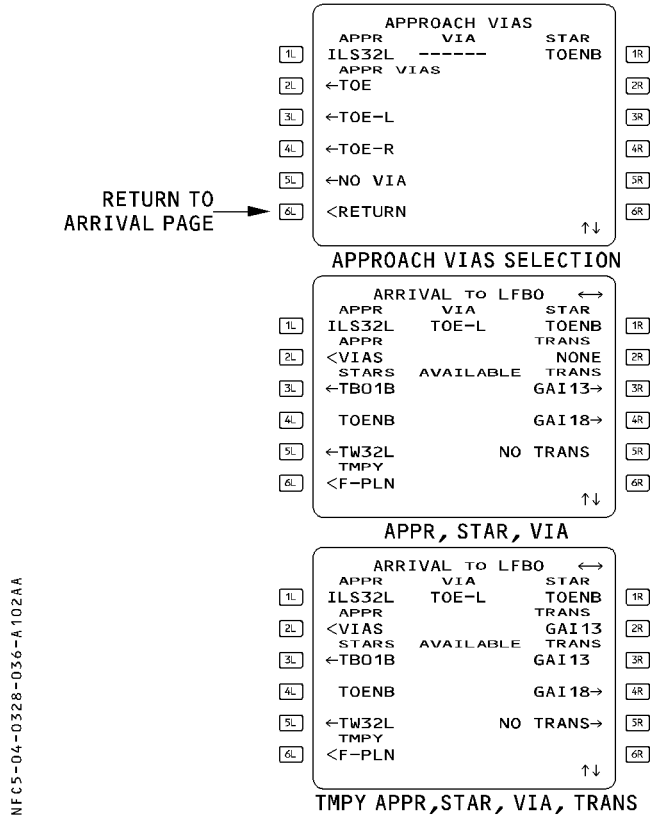


APPROACH SELECTION



APPROACH STAR SELECTION

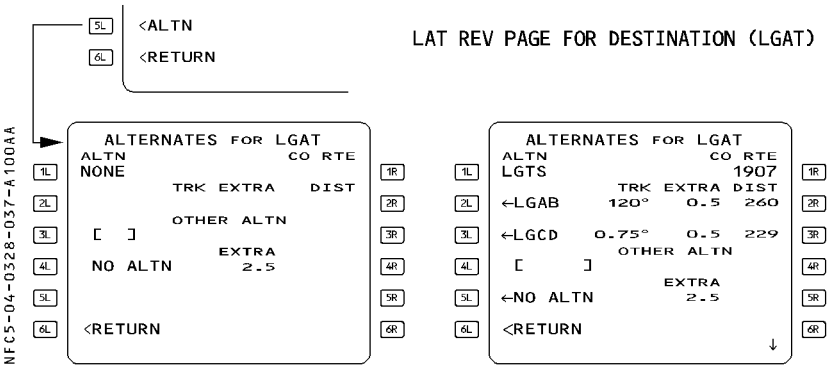
NFC5-04-0328-035-A102AA



NFC5-04-0328-036-A102AA

ALTERNATE PAGE

This page enables the pilot to review, in the NAV database, the alternate airports that are paired with the destination, and define additional alternates, if needed. (Alternate airports are linked to the destination). The pilot calls up this page with the ALTN prompt, from the lateral revision page for the destination.



TITLE — The destination airport is displayed in large green font.

[1L] ALTN — This field displays the selected alternate : In green, if it is active ; in yellow, if it is temporary. "NONE" is displayed, if NO ALTN option is selected, or if the destination has no alternate.

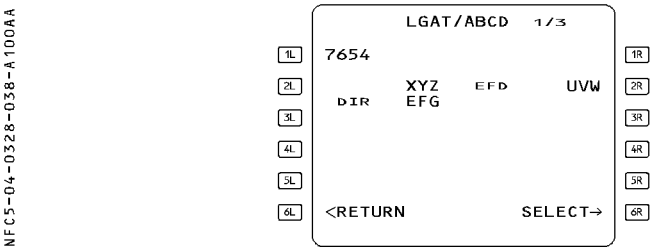
Line 2 to line 5 — These lines display the identifications of alternates (up to 6), the extra fuel weight remaining after landing at the alternates, and the great-circle track and distances to them from the destination.
If the database contains a company route between the destination and the alternate, the distance shown is an airway distance, not a great-circle distance.
When the database defines a preferred alternate, it is displayed on Line 2 (if no scrolling has been performed).

R

[4L] OTHER ALTN	The pilot can enter an airport identifier in the brackets (Line 3). If that airport is not stored in the database, the NEW RUNWAY page appears for the pilot to use in defining it. If it is stored in the database, the ROUTE SELECTION page appears, and the pilot can use it to select the best route. The pilot may enter a distance in the DIST field of the OTHER ALTN prompt, in order to get preliminary fuel predictions. However, once he has selected the alternate airfield as a temporary alternate and then inserted it, the ALTN distance either reverts to the airway distance, if he has selected a company route, or to the direct distance to the alternate. The pilot can use OTHER ALTN to overwrite and replace the previous OTHER ALTN.
NO ALTN	The pilot uses this key to select the NO ALTN option.
[6L] RETURN or THPY F-PLN	The pilot presses this key to revert the display to the LAT REV page. Pressing this key gives access to the TMPY F-PLN page corresponding to the last revised item.
[1R] CO RTE	Pressing this key displays the active company route between the destination and the selected alternate.

ROUTE SELECTION PAGE FOR ALTERNATE

This page enables the pilot to review the company route between the destination and the alternate, and to select a different route, if that seems appropriate.
This page comes up automatically, when the flight crew enters an ident in the OTHER ALTN field.
See the "Route Selection" page for a description of this page.

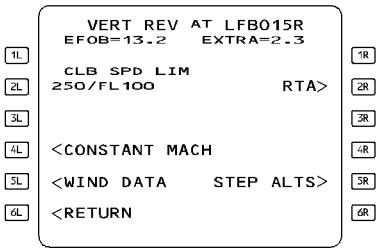


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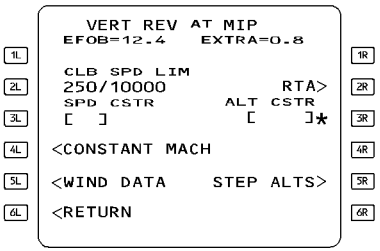
[6R] SELECT	Pressing this key reverts the display to the alternate page. (The distance between the destination and the alternate is then the airway distance).

VERTICAL REVISION PAGES

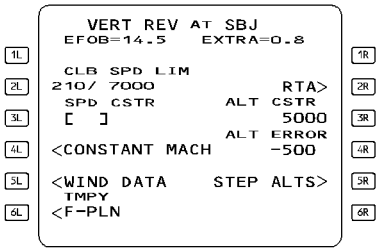
These pages contain the menu of available vertical flight plan revisions that can be applied at a selected waypoint.
The crew calls up these pages from the flight plan A or B pages by pressing the right-hand key next to the selected revised waypoint.
The crew may make several different vertical revisions although some may not be available at all waypoints.



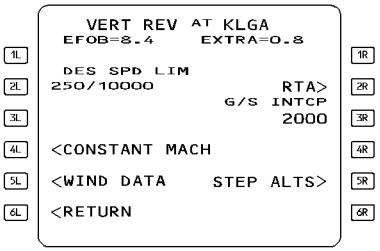
VERT REV AT ORIGIN



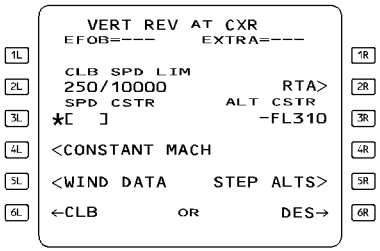
VERT REV AT CRUISE WPT



VERT REV AT WPT IN CLIMB.
(ALT CSTR ENTERED AND
PREDICTED MISSED)



VERT REV AT DEST



VERT REV AT WPT
(PREDICTIONS NOT AVAILABLE)

NFC5-04-0328-039-A102AA

TITLE (white)	"VERT REV AT [location]" The second line shows the remaining fuel and the extra fuel at the waypoint being revised.
[1L] "TOO STEEP PATH BEYOND" (amber)	Is displayed, if the waypoint is part of a leg with a descent path too steep.
[2L] CLB/DES SPD LIM (magenta)	Displays the speed limit applicable to the climb or descent phase. It is in large font when entered manually, and in small font when it comes from the database. It is in yellow, when a temporary flight plan exists.
[3L] SPD CSTR (magenta)	This field displays any speed constraint assigned to the revised waypoint. It is in large font when entered manually, and in small font when it comes from the database. It is not displayed at the origin airport, at a FROM waypoint, at a speed limit pseudo-waypoint, or at the destination airport. It is in yellow, when a temporary F-PLN exists. A CLR action reverts it to brackets.
[4L] CONSTANT MACH	This prompt provides access to the CONSTANT MACH page.
[5L] WIND DATA (white)	This prompt is only displayed for climb, cruise and descent waypoints, respectively giving access to the CLIMB, CRUISE and DESCENT WIND pages for wind data at the revised point.
[6L] RETURN or TMPY F-PLN or ← CLB	The pilot presses this key to return to the last displayed flight plan page. When a temporary flight plan exists, the TMPY F-PLN prompt appears and provides access to this page. When "← CLB" is displayed, pressing this key assigns the constraint to CLB phase and inserts it into the vertical temporary flight plan.
[2R] RTA	This prompt provides access to the Required Time Arrival (RTA) page. It is not displayed when the VERT REV page is accessed from the alternate F-PLN.

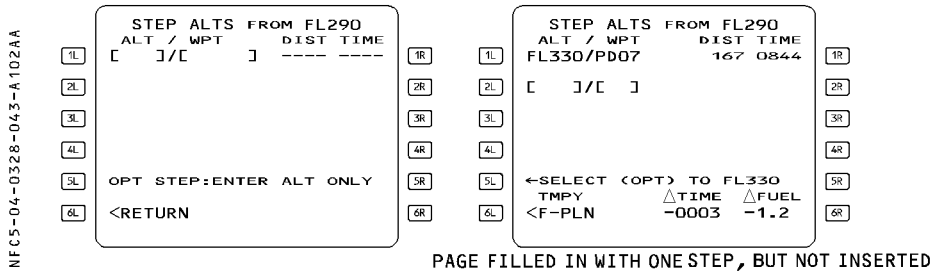
[3R] ALT CSTR (magenta)	This field displays the altitude constraint assigned to this revised waypoint. It is in large font when the constraint is manually-entered, and in small font when it comes from the database. A CLR action reverts it to brackets. The constraint may be : · "At", entered as XXXXX (Example : FL180). · "At or above", entered as + XXXXX or XXXXX + (Example : + FL310). · "At or below", entered as – XXXXX or XXXXX – (Example : – 5000). · A "window" constraint. The altitude window consists of two altitudes within which the aircraft should fly. The crew cannot manually enter a "window" constraint. It is in yellow when a temporary flight plan exists.
G/S INTCP (green)	This field displays the glide intercept altitude for an ILS approach on the vertical revision page at destination. It cannot be modified by the pilot.
[4R] ALT ERROR (green)	When the aircraft misses a predicted altitude constraint, this field displays the difference between the altitude constraint and the predicted altitude. If, for example, "– 500" appears in this field in green, the aircraft will reach the waypoint at an altitude 500 feet below the constraint altitude. This only applies to waypoints in the climb and descent phases.
[5R] STEP ALTS (white)	This legend appears for any waypoint, once a cruise altitude has been entered. It is not available in engine-out, descent, approach, and go-around phases. This gives the pilot access to the STEP ALTS page.
[6R] DES →	When this field displays "DES", pressing this key assigns the constraints to the descent phase and inserts them into the vertical temporary flight plan. (See note below).

Note : Altitude and speed constraints may apply to the climb, descent, or approach phase, but never to the cruise phase. The 6L/6R fields display "CLB/DES" when the revised waypoint is a cruise phase waypoint, and the FMGS needs to know if the new constraint is to be applied in climb or descent phase. The FMGS will modify the cruise phase accordingly. These 2 prompts also display "CLB/DES" when the predictions are not computed. (Top of climb and top of descent not yet defined).

INTENTIONALLY LEFT BLANK

STEP ALTS PAGE

This page enables the pilot to insert up to four geographic step points and one optimal step point into the flight plan. This page also displays the fuel/time savings associated with the optional step.
The crew calls it up from the vertical revision page.



PAGE FILLED IN WITH ONE STEP, BUT NOT INSERTED

TITLE — STEP ALTS followed by the current cruise altitude.

[1L] – [1R]
[4L] – [4R]

ALT/WPT (blue) — The waypoint identifier, as well as the altitude to step, can be entered in this field. Both are displayed in large font. When an entry is made, a temporary F-PLN is created.

DIST / TIME (UTC) (small green font) — Displays the distance to go, and time from the present aircraft position along the flight plan to the step point.

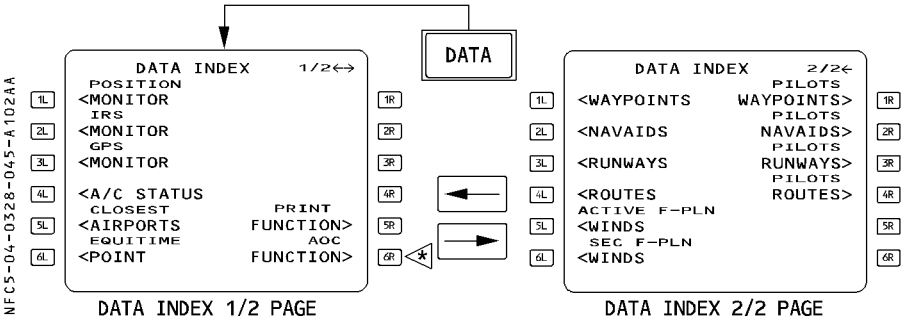
Note : The following messages may be displayed in the DIST / TIME field :

- *"ABOVE MAX", if the step altitude exceeds the Max altitude.*
- *"IGNORED", if the end step point is less than 50 NM from the top of descent.*
- *"STEP AHEAD", when the aircraft is within 20 NM of the start step point.*
- *NO OPTIMAL, if an inserted optimal step fails in a discontinuity due to a flight plan change, or if a time constraint exists in the flight plan.*

[5L] OPT STEP : ENTER ONLY ALT (white)	Is displayed to guide the crew for the entry format of an optimal step.
(OPT) FROZEN : RTA EXISTS	Is displayed, if a time constraint exists in the flight plan.
SELECT (OPT) TO FLXXX	This prompt allows the selection of the optimal step.
NO OPTIMAL STEP	Is displayed when the system cannot determine the optimal point for the corresponding altitude.
[6L] RETURN or TMPY F-PLN	The flight crew presses this key to return to the previous page. Appears when a temporary flight plan exists. It provides access to the temporary flight plan page.
[6R] △TIME/△FUEL (green)	Time and fuel savings represent the gain from selecting the optimal step : The difference in flight time and fuel consumption between the F-PLN without the optimal step selected and the F-PLN with the optimal step selected. It is displayed, when an optimal step has been computed. As soon as the optimum step is selected, the time/fuel savings information is no longer displayed.

DATA INDEX PAGES

There are two INDEX pages :
The DATA INDEX 1/2 page gives access to various pages assigned to navigation.
The DATA INDEX 2/2 page lists the navigation data, entered in the FMGS.
The crew enters those items labeled "PILOTS" and can modify them. The crew can call up the others, but cannot modify them.
The crew calls up these pages by pressing the DATA key on the MCDU console :



DATA INDEX 1/2 PAGE
DATA INDEX 2/2 PAGE

DATA INDEX 1/2 PAGE

[1L] POSITION MONITOR	When the flight crew presses these keys, the display shows all essential navigation data.
[2L] IRS MONITOR	
[3L] GPS MONITOR	This key calls up the GPS MONITOR page.
[4L] A/C STATUS	This key calls up the aircraft status page.
[5L] CLOSEST AIRPORTS.	This key calls up the closest airports page.
[6L] EQUI-TIME POINT	This key calls up the equi-time point page.
[5R] PRINT ◁	This keys calls up the printer function pages.
[6R] AOC ◁	This key calls up the ACARS function pages.

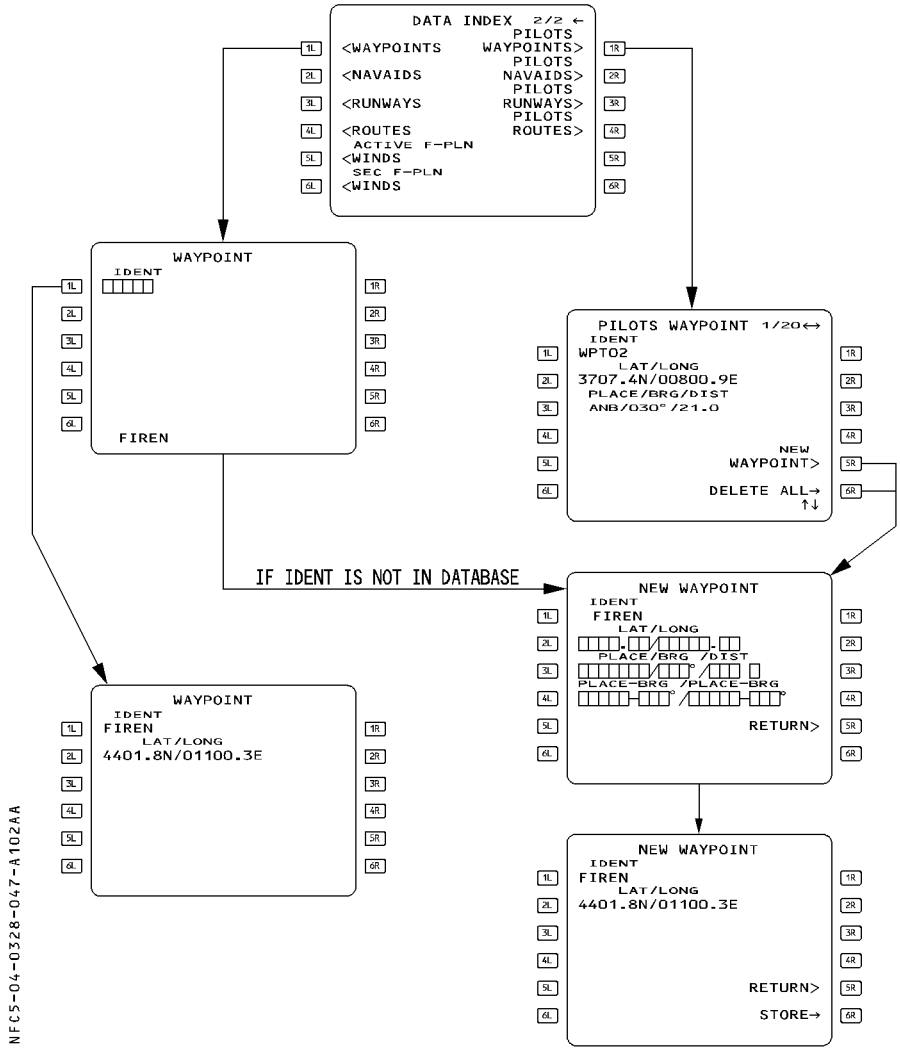
DATA INDEX 2/2 PAGE

[1L] WAYPOINTS	These keys call up descriptions of waypoints, navaids, runways, and routes stored in the database, so that they can be reviewed.
[2L] NAVAIDS	
[3L] RUNWAYS	
[4L] ROUTES	
[5L] ACTIVE F-PLN WINDS	This key calls up the appropriate active F-PLN WIND page (CLIMB, CRUISE or DESCENT)
[6L] SEC F-PLN WIND	This key calls up the appropriate secondary F-PLN page (CLIMB, CRUISE or DESCENT).

[1R] PILOTS WAYPOINTS
[2R] PILOTS NAVAIDS
[3R] PILOTS RUNWAYS
[4R] PILOTS ROUTES

These keys call up waypoints, navaids, runways, and routes that the pilot has stored, enabling the pilot to review and store them in, or delete them from, the database.
The airline can choose to automatically have all pilot-stored data erased in the done phase.

WAYPOINT/PILOTS WAYPOINT/NEW WAYPOINT PAGES



NFCS-04-0328-047-A102AA

WAYPOINT PAGE

- The pilot calls up this page by pressing the 1L key on the DATA INDEX page. It displays waypoint information associated with the identifier, which the flight crew inserts in the [1L] field.
- From this page, it is possible to call up any waypoint from the navigation database, or any waypoint not stored in the stored waypoint list, if they belong to the active, temporary, or secondary flight plan.

PILOTS' WAYPOINT PAGE

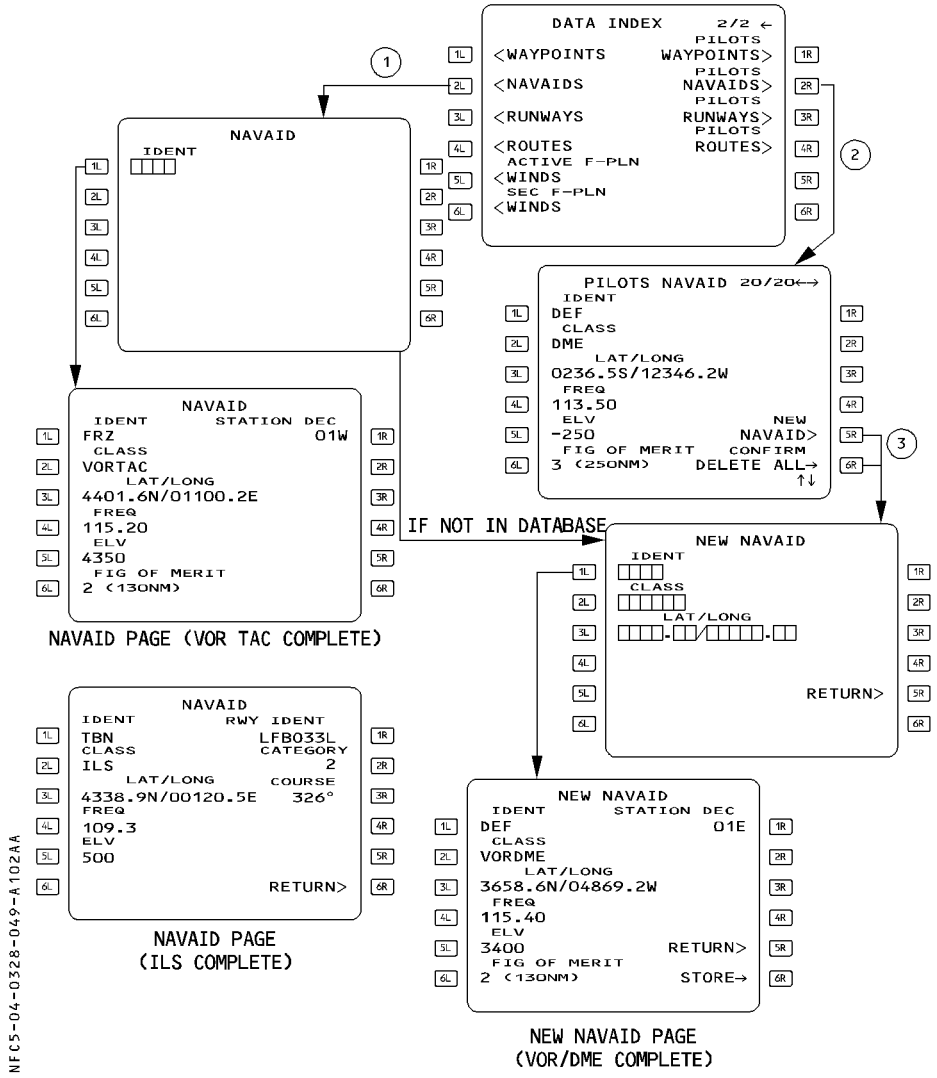
The pilot calls up this page by pressing the 1R key on the DATA INDEX page. It displays waypoints, defined and stored by the pilot. It lists each stored waypoint, along with a number that shows the relative order in which it was inserted in the database. This number is displayed in the upper right-hand corner of the page. For example, "1/20" indicates that
R the waypoint was the first of 20 stored.

[1L] IDENT	To delete a waypoint, the pilot clears the 1L ident display.
[2L] LAT/LONG	The waypoint latitude and longitude are displayed in this field.
[3L]	This field displays PLACE/BRG/DIST, or PLACE-BRG/ PLACE-BRG, or PLACE/DIST, depending on how the waypoint was defined.
[5R] NEW WAYPOINT	The pilot presses this key to call up the NEW WAYPOINT page.
[6R] DELETE ALL	The pilot presses this key and the label changes to an amber "CONFIRM DELETE ALL". Pressing this key a second time deletes all the waypoints stored by the flight crew, except those currently used in the active or secondary flight plan. ("PILOT ELEMENT RETAINED" appears on the MCDU).

NEW WAYPOINT PAGE

- The pilot calls up this page by pressing the 5R key on the PILOTS' WAYPOINT page.
- The pilot can use this page to define and store up to 20 waypoints. Entering an additional waypoint deletes the first one.
  The pilot defines a waypoint by entering its ident in the data field next to 1L, then by entering its position in the amber boxes.
  The STORE prompt appears next to 6R when the boxes are filled in, and the pilot presses the key to store the waypoint in the database.
  If the pilot enters the waypoint's position as place/bearing/distance, or place-bearing/ place-bearing, the FMGC computes its latitude and longitude.

NAVAID/PILOTS' NAVAID/NEW NAVAID PAGES



NAVAID PAGE (VOR TAC COMPLETE)

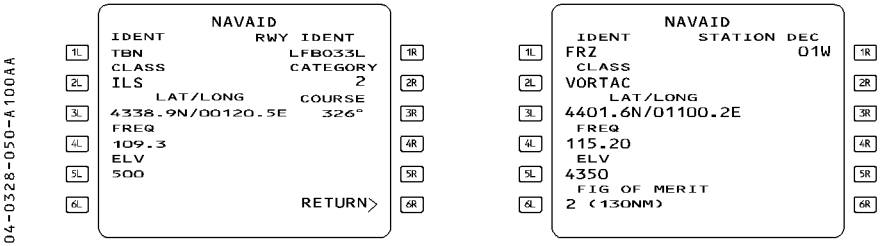
NAVAID PAGE (ILS COMPLETE)

NEW NAVAID PAGE (VOR/DME COMPLETE)

NFC5-04-0328-049-A102AA

NAVAID PAGE

The pilot calls up this page by pressing the 2L key on the DATA INDEX page 2.
This page displays navaid information associated with the identifier the pilot inserts in the [1L] field.



NFCS-04-0328-050-A100AA

NAVAID PAGE (ILS)

NAVAID PAGE (VOR TAC)

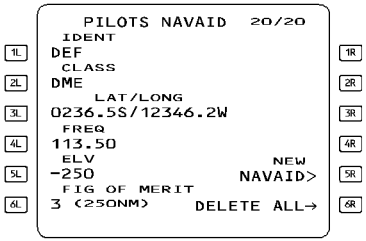
[2L] CLASS	This field identifies the navaid as VOR, DME, VOR DME, VORTAC, NDB, LOC, ILS, MLS, ILS/DME, MLS/DME, ILS/TAC or TACAN. It displays NON COLLOCATED, if the navaid is uncollocated.
[3L] LAT/LONG	If a uncollocated VOR DME or VORTAC is displayed, the LAT/LONG is the VOR latitude and longitude. The LAT/LONG displayed for an ILS, ILS DME, ILS TAC is the LAT/LONG of the localizer.
[4L] FREQ or CHAN	CHAN is displayed, if the class of navaid is an MLS or an MLS DME.
[5L] ELV	This field gives the navaid elevation in feet above sea level. It is not displayed for VOR or NDB.
[6L] FIG OF MERIT	This field shows how far out the FMGS can autotune a VOR, VOR/DME, VORTAC, or DME for display or for computing position. 0 : Up to 40 NM 1 : Up to 70 NM 2 : Up to 130 NM 3 : Up to 250 NM
[1R] STATION DEC or RWY IDENT	This is the magnetic declination in the navaid area (used only for VOR, VOR/DME, and VORTAC). The field displays RWY IDENT, if the navaid is a LOC, ILS, MLS, ILS/DME, MLS/DME or ILS/TAC.
[2R] CATEGORY	This field shows the navaid's category, if it is an ILS, ILS/DME, MLS, MLS/DME or ILS/TAC. A LOC DME has a category = 0.
[3R] COURSE	This is the localizer course, if the navaid is an ILS or a LOC, ILS TAC, ILS, MLS or MLS/DME.

[6R] RETURN — This prompt is displayed, if the page is accessed from the SELECTED NAVAID page. The pilot presses this key to return to the SELECTED NAVAID page.

PILOTS' NAVAID PAGE

The pilot calls up this page by pressing the 2R key on the DATA INDEX page. This page is used to display or delete defined and stored navaids.

NFC5-04-0328-051-A100AA



A number in the upper right-hand corner of the screen shows the relative order in which the navaids were stored. (For example, 3/7 means the third of seven stored). Scroll keys are used to access the different stored navaids.

[1L] IDENT — The pilot deletes a stored navaid by entering its ident in this field, then by pressing the CLR key at the bottom of the MCDU control panel.

[2L] - [6L] — Same as the NAVAID page, but data is displayed in green.

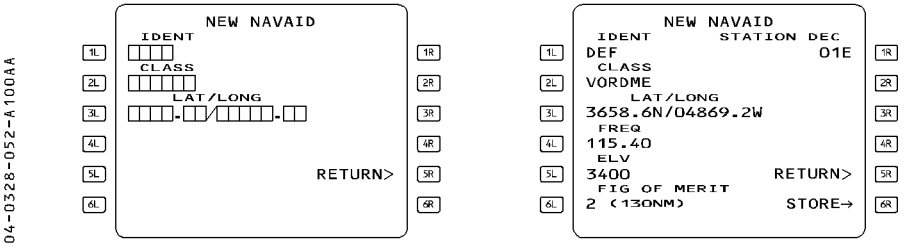
[1R] - [4R] — Same as the NAVAID page, but data is displayed in green.

[5R] NEW NAVAID — This key calls up the NEW NAVAID page to define and store a navaid.

[6R] DELETE ALL and CONFIRM DELETE ALL — The pilot presses this key to erase all the stored navaids, except those currently used in the active or secondary flight plan. (The MCDU displays "PILOT ELEMENT RETAINED.").

NEW NAVAID PAGE

The pilot calls up this page by pressing the 5R key on the STORED NAVAID page.



EMPTY NEW NAVAID PAGE

NEW NAVAID PAGE (VOR/DME)

NFCS-04-0328-052-A100AA

It can be used to define and store up to 20 navaids. Entering an additional waypoint deletes the first one. The navaid elements must be entered in two steps :

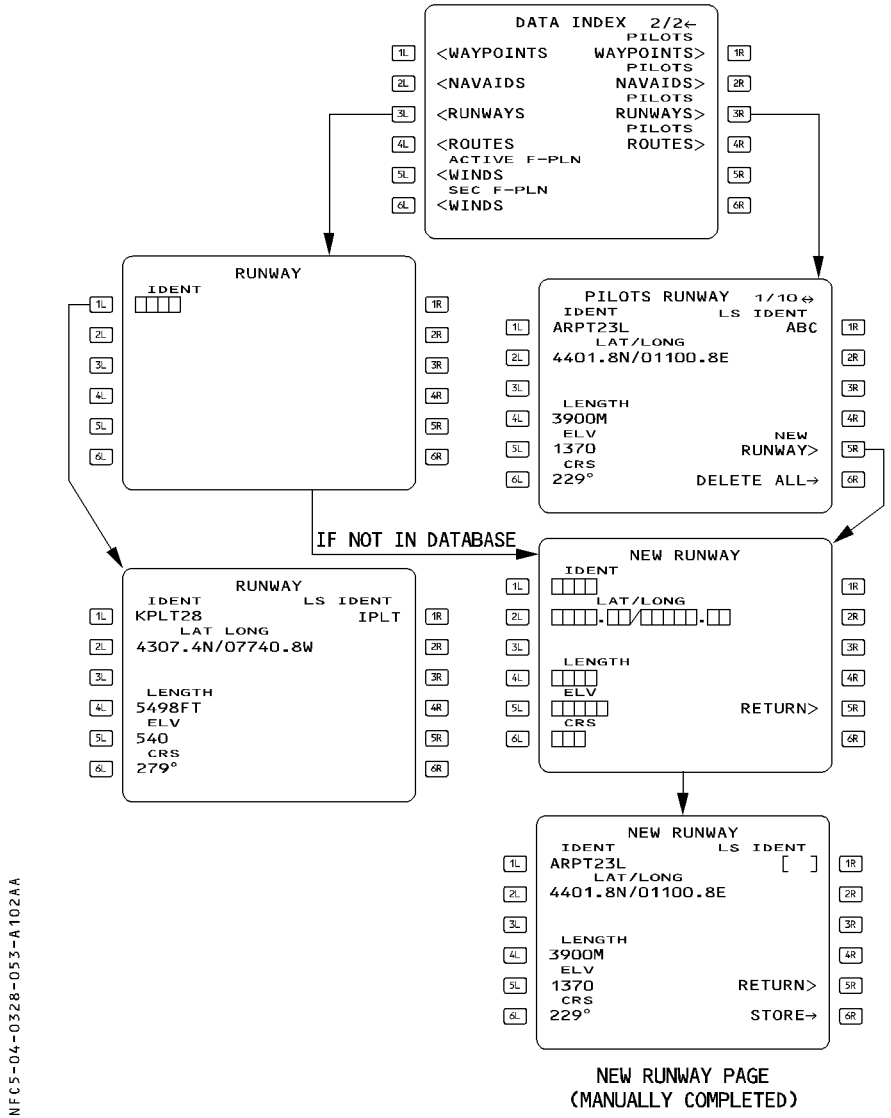
1. Enter the data in the amber-boxed lines.
2. Enter frequency, elevation, figure of merit, and station declination or ILS category and course, if applicable.

Note : The pilot cannot create an ILS/DME, MLS/DME, or ILS/TAC or an uncollocated navaid.
If the runway associated with the ILS or MLS has been entered via the new runway page, the course, ident, and runway ident are already displayed on the new navaid page when it comes up (copied from the new runway page). For details, see the new runway page info below.

[1R] STATION DEC	The pilot must enter the magnetic declination, if the prompt is displayed. This prompt is only displayed for VOR, VORTAC, or VOR/DME.
[3R] COURSE	If the navaid is an ILS, MLS, LOC, enter the course.
[6R] STORE	This prompt appears when all the amber boxes have been filled in. The pilot presses this key to store the navaid.

A stored navaid is never used for position computation.

RUNWAYS/PILOTS' RUNWAYS/NEW RUNWAY PAGES



NEW RUNWAY PAGE
(MANUALLY COMPLETED)

NFCS-04-0328-053-A102AA

RUNWAY PAGE

This page displays the following information :

[1L] IDENT	The runway ident, which comprises the airport identification and the runway direction, uses six or seven digits (Example : CYYZ 24L and LFRJ 08).
[2L] LAT/LONG	The latitude and longitude of the runway threshold.
[4L] LENGTH	The runway length in meters (M) or feet (ft), in four digits (26300 feet or 8000 m).
[5L] ELV	The elevation of the threshold in feet above sea level.
[6L] CRS	The runway course (degrees magnetic).
[1R] LS IDENT	The LOC, ILS or MLS identifier.

PILOTS' RUNWAY PAGE

The pilot uses this page to display or delete the defined and stored runways. The stored runways are listed and numbered in the order in which they were inserted. The number is displayed in the upper right-hand corner of the page. (For example, 2/4 means the runway is the second of four stored runways).
The pilot can delete any stored runway from the database by displaying its ident in the 1L field, then by pressing the CLR key on the MCDU control panel.

[6R] DELETE ALL and CONFIRM DELETE ALL	The pilot presses this key to erase all the stored runways, except those used in the active or secondary flight plan. (The MCDU displays "PILOT ELEMENT RETAINED").
[1L] to [6L]	These fields are similar to the RUNWAY page fields.

NEW RUNWAY PAGE

The pilot can use this page to define and store up to 10 runways.
When the pilot enters an ILS/LOC ident in the [1R] field, the new navaid page comes up. When the pilot has entered and stored the necessary data in the new navaid page, the new runway page reappears.
The new runway page and the new navaid page (ILS/LOC) are not independent :

- When the flight crew first defines the ILS/LOC (on the new navaid page), the new runway page, when called up, already displays the RWY course, RWY ident, and ILS ident (copied from the new navaid page).
- When the flight crew first defines the runway (on the new runway page), the new navaid page, when called up, already displays the ILS course, ILS ident, and runway ident.

The pilot must enter the two runway directions on two different new runway pages (Example : LFRJ 08 and LFRJ 26) to allow the flight plan to select either one.

Note : When 10 runways are stored, entering a new stored runway deletes the first one of the list (1/10).

[1L] to [6L] These keys are used to enter information about the new runway.

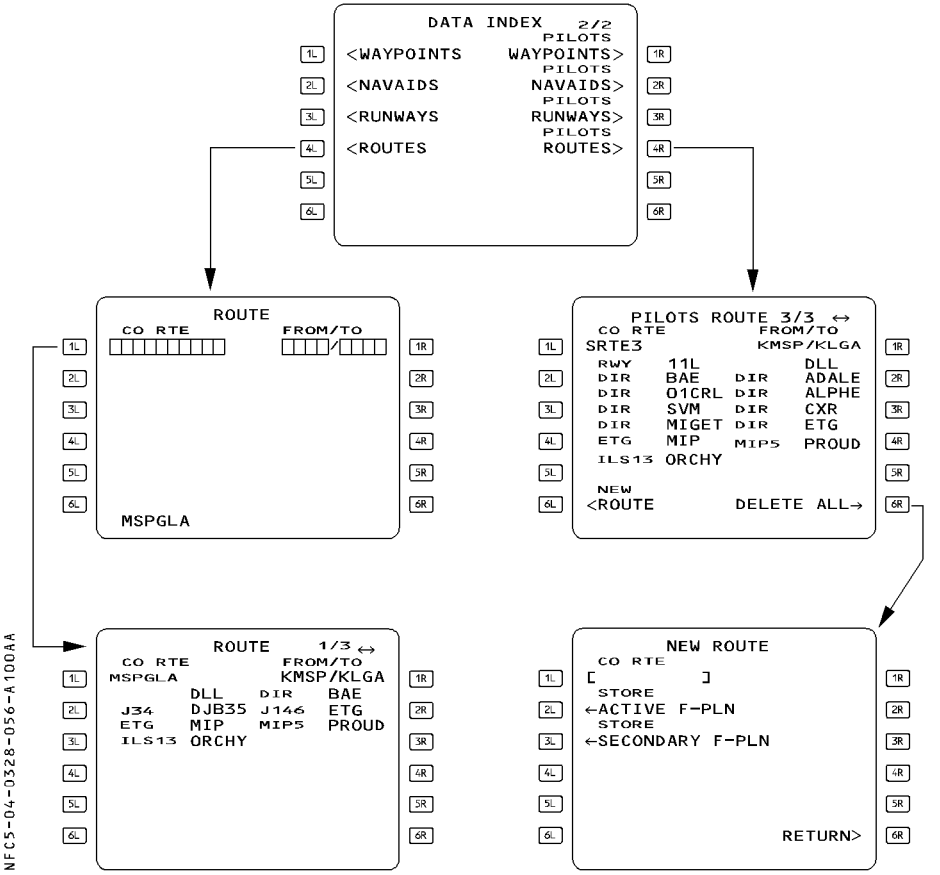
[1R] LS IDENT This key is used to enter the ILS/MLS/LOC ident. The NEW NAVAID page comes up.

[5R] RETURN The pilot presses this key to return to the NEW NAVAID page.

[6R] STORE This prompt only appears when all the amber boxes have been filled in.

R *Note :* — *The NEW RUNWAY may be used for departure or destination, but no SID or STAR can be associated or stored with this runway. Therefore, the pilot will use it as an "independent" airport.*
A new runway is identified by the 4–letter ICAO airport identifier, although all six or seven digits must be entered.

ROUTE/ PILOTS' ROUTE/NEW ROUTE PAGES



ROUTE PAGES

(Not-modifiable)

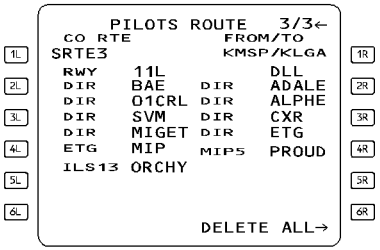
[1L] CO RTE — Any company route ident, entered in this field, causes all the elements of the route to be displayed.

Line 2 to Line 6 — These lines display the various route elements, including waypoints and airways.

[1R] FROM/TO — This field is automatically filled in, when the pilot enters the ident for a company route. When the pilot manually enters a city pair, the MCDU displays "NOT IN DATA BASE", if the city pair is not in the navigation database. If the city pair is in the database, the CO RTE field displays the first route stored in small blue font. If more than one route is stored, the pilot can scroll to see the different routes.

PILOTS' ROUTE PAGE

NFC5-04-0328-057-A100AA



This page displays up to 5 routes, stored by the pilot. The Pilots' routes are listed and numbered in the order of insertion. The number is displayed in the upper right-hand corner of the page.

[1L] CO RTE — This field identifies the stored route. Clearing this field deletes the stored route.

Line 2 to Line 5 — The fields in these lines are identical to the corresponding fields on the route page.

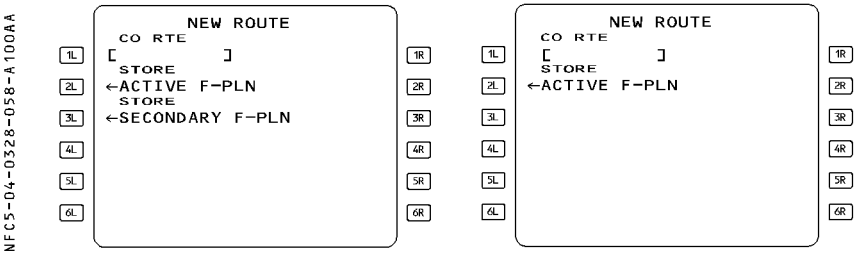
[6L] NEW ROUTE — Pressing this key calls up the new route page.

[1R] FROM/TO — This identifies the city pair of the stored route.

[6R] DELETE ALL — Pressing this key changes the label "CONFIRM DELETE ALL" which appears in amber. Pressing this key a second time deletes all previously-stored routes.

NEW ROUTE PAGE

The pilot calls up this page by pressing the NEW ROUTE key on the PILOT'S ROUTE page. It can be used to store up to five new routes that have already been defined in the active or secondary flight plan.



[1L] CO RTE — This field allows the pilot to enter a new company route ident. If that ident has already been assigned, the entry is rejected . The message NON UNIQUE ROUTE is then displayed.

[2L] STORE ACTIVE F-PLN (cyan)
Pressing this key stores parameters of the active flight plan as a new route.
This prompt appears when the system contains a FROM/TO, but only during preflight.

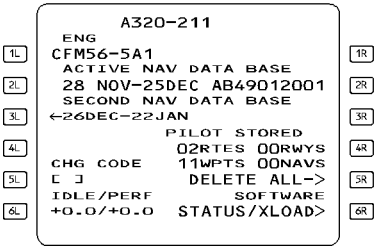
[3L] STORE SECONDARY F-PLN (cyan)
Pressing this key stores parameters of the secondary flight plan as a new route.
This prompt appears when the system contains a FROM/TO, and the secondary flight plan has not yet been sequenced.

Note :
- *If it has not already been named, a stored route is automatically named (SRTE 1 to SRTE 5) when stored.*
- *When 5 routes are already stored, the pilot cannot insert a new stored route. The "PILOTS' ROUTE FULL" message is displayed, and the pilot must manually delete a route, in order to be able to store a new one.*
- *The following flight plan elements are not retained when the route is stored :*
  - *Pilot-entered holds and constraints*
  - *Offset*
  - *Modifications to terminal procedures*
  - *Pseudo waypoints*
  - *Step at optimum*
  - *The MCDU then displays "REVISIONS NOT STORED".*

AIRCRAFT STATUS PAGE

R The pilot call this page up by pressing the DATA key on the MCDU console.

NFC5-04-0328-059-A100AA



TITLE	AIRCRAFT TYPE
[1L] ENGINE TYPE	The system uses this engine model to calculate predictions.
[2L] ACTIVE DATABASE	The validity period and part number are displayed in large font.
[3L] SECOND DATABASE	The validity period and part number are displayed in small font. The pilot can press the 3L key to switch to the second database as the active database.

CAUTION

Cycling the database erases the primary and secondary flight plans, as well as the stored data. The flight crew must never do this in flight.

[5L] CHG CODE	This field allows entry of a code which permits modification of the IDLE and/or PERF factor displayed in 6L. It is displayed in the PREFLIGHT and DONE phases. The label is displayed in small white fonts ; the brackets, or the entered value, are displayed in large blue fonts.
[6L] IDLE/PERF	These factors can only be modified while the aircraft is on ground. If no value has been entered, the default value, taken from the airline policy file, is displayed in small font. Some aircraft require the IDLE/PERF factor to be adjusted. The crew may use the following procedure : – Enter ARM into brackets in the CHG CODE line [5L]. – Write the new IDLE/PERF factor in the scratchpad. – Enter this new factor in line [6L]. The entered factor is displayed in large green font. The airline may change the ARM code.

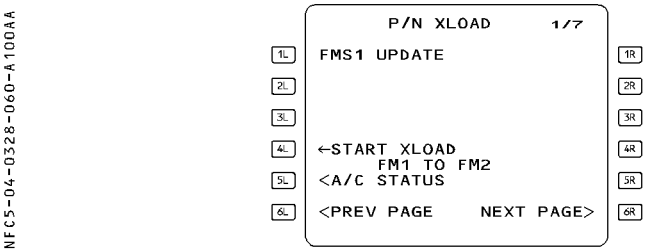
[4R] STORED — This field displays pilot-stored data in a large green font. The field is blank, if no data is stored. (The airline can choose to have this data automatically erased at the done phase).

[5R] DELETE ALL — Pressing this key changes the label to "CONFIRM DELETE ALL" in amber. Pressing this key a second time deletes all pilot-stored data, except data that is part of the active and secondary flight plans.

[6R] STATUS/XLOAD — This prompt gives access to the P/N STATUS and P/N XLOAD pages.

P/N XLOAD PAGE

This page allows the crossloading of all databases or configuration files' part numbers which are different between both sides. Crossloading from this page avoids reviewing each individual P/N STATUS page.



TITLE — P/N XLOAD

[1L] — FMS1 UPDATE : FMS1 can be loaded on the right side MCDU.
FMS2 UPDATE : FMS2 can be loaded on the left side MCDU

[4L] — START XLOAD : This blue prompt is displayed, only if the system detects a difference between both sides' part numbers.
FMS1/FMS2 IDENTICAL : Displayed in green, when there is no difference between both sides' part numbers.

Line 5 — FM1 TO FM2 or FM2 TO FM1 : Indicates the crossloading direction.

[5L] — A/C STATUS : This white prompt is displayed, when there is no crossloading in progress. It gives access to the A/C STATUS page.
MM : SS MIN REMAINING : Indicates the time remaining for crossload completion, when a crossload is in progress.

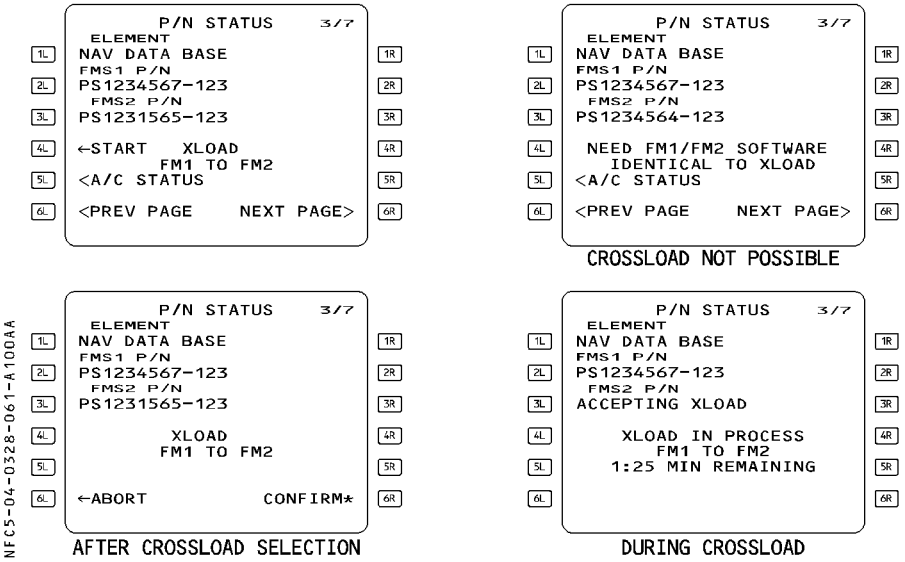
[6L] PREV PAGE — The pilot presses this key to return to the A/C STATUS page.

[6R] NEXT PAGE — Pressing this key calls up the next P/N XLOAD page.

P/N STATUS PAGES

These pages enable the following databases and configuration files to be reviewed and crossloaded between both FMS :

— Page 2 FMS SOFTWARE part numbers
— Page 3 NAV DATA BASE part numbers
— Page 4 FM AIRLINE CONFIG part numbers
— Page 5 FM OPTIONS CONFIG part numbers
— Page 6 PERF DATA BASE part numbers
— Page 7 MAG VAR DATABASE part numbers



TITLE — P/N STATUS

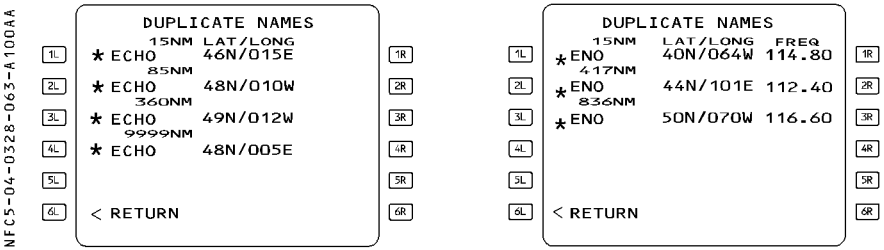
Line 1 ELEMENT — Indicates the name of the database or configuration file that can be crossloaded :

— FMS SOFTWARE on Page 2
— NAV DATA BASE on Page 3
— FM AIRLINE CONFIG on Page 4
— FM OPTIONS CONFIG on Page 5
— PERF DATA BASE on Page 6
— MAG VAR DATABASE on page 7

Line 2 FMS1 P/N Line 3 FMS2 P/N	These fields display the part numbers of the database or configuration file (stated on line 1), that are installed on the FMS 1 and 2. Identical part numbers are displayed in green, different ones in amber. During crossload, the updated part number is replaced by the "ACCEPTING XLOAD" amber message.
Line 4	This line is empty when the active flight phase is not Preflight or Done. XLOAD FMx TO FMy or START XLOAD FMx TO FMy : This blue prompt is displayed when the database or configuration file (stated on line 1) can be crossloaded. XLOAD ARMED : Displayed in blue on the receiving FM when the crossload has been requested, but not yet confirmed. XLOAD IN PROCESS : Displayed in white, when the crossload is ongoing. A/C ENG NOT SUPPORTED : Related to the Performance Database only. It is displayed when the FMS performance database model is incompatible with the aircraft/engine's pin program. XLOAD NOT SUPPORTED : Crossloading is unavailable for this element. NO P/N TO XLOAD : The element is missing. NEED FG1/FG2 IDENTICAL TO XLOAD : The receiving side's FG software is incompatible with the FG software to be crossloaded. NEED FM1/FM2 SOFTWARE IDENTICAL TO XLOAD : The crossloaded element is incompatible with the receiving side's FM software.
[5L] A/C STATUS	This prompt is available, when no crossload is in process. This gives the pilot access to the aircraft status page. MM : SS MIN REMAINING : Displays the time remaining to complete the crossload, when a crossload is in process.
[6L] PREV PAGE	This key calls up the previous P/N STATUS page.
ABORT	This amber prompt is displayed when a crossload is in progress. The pilot uses it to stop the crossload.
[6R] NEXT PAGE	This key calls up the next P/N STATUS page.
CONFIRM*	This amber prompt is displayed when a crossload has been armed. The pilot presses it to start the crossload.

DUPLICATE NAMES PAGE

This page automatically appears and enables the pilot to select a specific waypoint, airport, or navaid, when the database has more than one with the same identifier.



The pilot presses the key adjacent to a waypoint, navaid, or airport, to select it as the one to be entered. When the pilot has finished, the page automatically reverts to the previously displayed page.

Distance

The direct distance to the aircraft is displayed in green above each name. If this distance is greater than 9999 NM, then + 9999 NM is displayed.

LAT/LONG column

This column lists the rounded off latitudes and longitudes of the different points, using the same identifier.

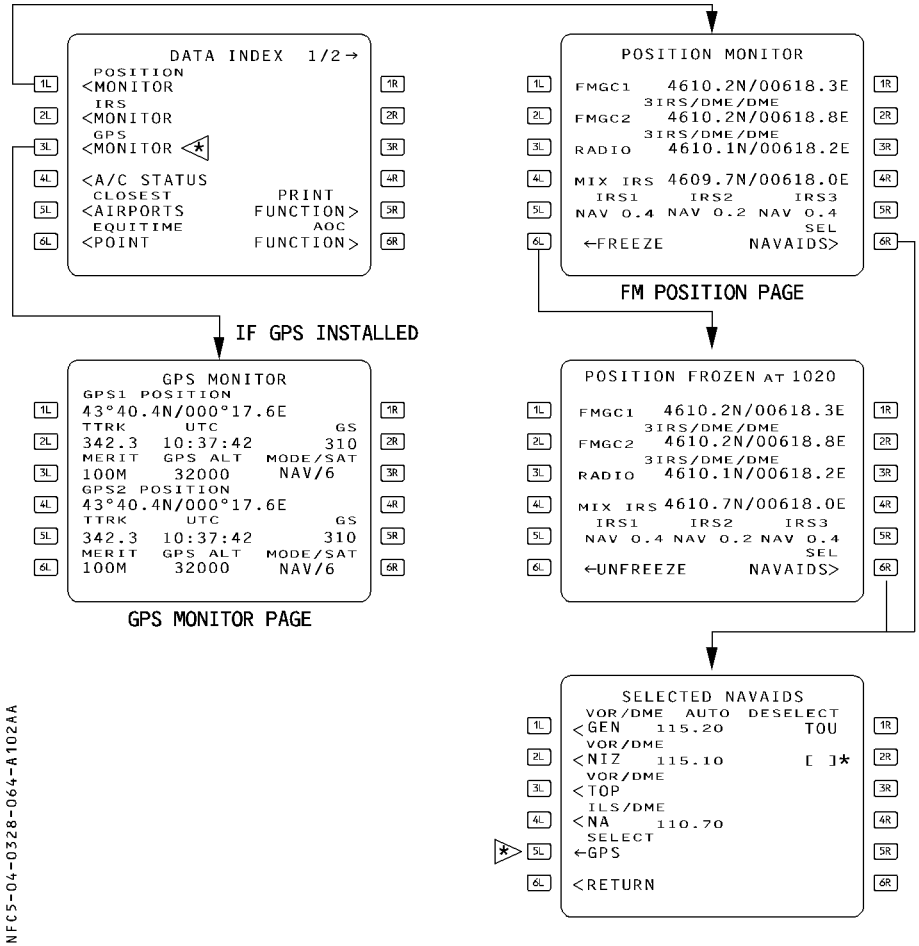
FREQ/CHAN column

This column lists the navaids frequencies, if any. It displays CHAN for an MLS.

Note :
- *The DUPLICATE NAMES page is not displayed, when 2 waypoints with the same ident belong to the same airway. The system selects the first waypoint found in the database.*
- *The waypoints or navaids are ranked according to their distance from the aircraft's position.*
- *When a waypoint is named using ICAO phonetic alpha characters, a minus sign and the ICAO code of the country where the waypoint is located, are displayed. e.g. Alpha in France becomes A-LF ; Bravo in England becomes B-EG.*

POSITION MONITOR PAGE

This page displays all the different positions that the FMGC has computed with the various available navigation methods. It also shows which method obtained each position. (The positions should be almost identical).
The pilot calls up this page by pressing the 1L key on the data index page.



NFCS-04-0328-064-A102AA

POSITION MONITOR AND POSITION FROZEN PAGE

Line 1 FMS 1	This line shows the latitude and longitude, as calculated by the onside FMGC, and the navigation method used by the FMGC for that calculation (Example : "3IRS/DME/DME").
Line 2 FMS 2	This line shows the latitude and longitude, as calculated by the opposite FMGC, and the navigation method used.
Line 3 RADIO or GPS or GPIRS	This line shows the latitude and longitude, calculated by the onside FMGC from selected radio navaids (Example : DME/DME, VOR/DME, or LOC) or from GPS or GPIRS.
Line 4 MIX IRS	This line shows the latitude and longitude of the weighted mean inertial reference system (IRS) calculated by the onside FMGC from the available IRSs.
Line 5 IRS 1,2,3	This line shows the deviation in nautical miles of each IRS position from the onside FMGC position. It also displays the IRS mode, which can be INVAL, ALIGN, NAV or ATT. *Note : INVAL is displayed when an ADIRS has failed, or the IRS position is not refreshed.*
[6L] FREEZE/UNFREEZE	The pilot presses this key to freeze (or unfreeze) all the data displayed on the page. When the data is frozen, the title of the page specifies the time at which it was frozen.
[6R] SEL NAVAIDS	The pilot presses this key to access the selected navaids page.

SELECTED NAVAIDS PAGE

MODIFIABLE ONLY FOR DESELECTION

Line 1	This field displays the navaid tuned for display purposes, and the tuning mode (AUTO, MAN, or RMP).
Line 2 and 3	These fields display the navaids, if any, tuned for the calculation of radio position by the FMGC.
[4L]	This field displays the tuned ILS (or MLS), if any.
[5L] DESELECT/SELECT GPS	The crew presses this key to manually select or deselect the GPS for position computation. Upon transition to the DONE phase, the prompt returns to DESELECT status. If the pilot deselects the GPS, "GPS IS DESELECTED" is displayed when the aircraft is less than 80 NM from the top of descent, or in approach phase.

[6L] RETURN

The pilot presses this key to return to the POSITION MONITOR page.

[1R] DESELECT

R to

R [6R]

The pilot deselects a navaid by entering its identifier in one of these six fields. Once deselected in this way, the navaid can still be manually tuned by entering its ident and displayed on the ND.
The deselection is cleared :

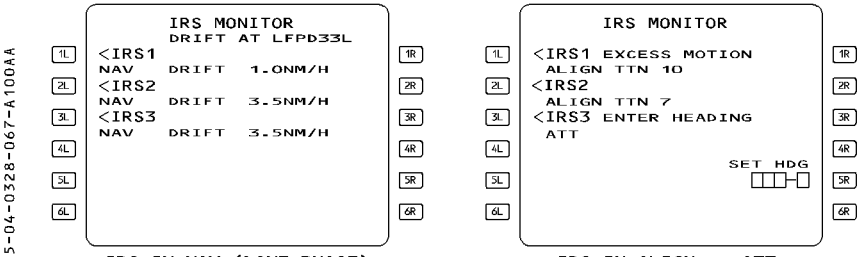
- Manually, by a CLR action in this field, or
- Automatically upon transition to the done or preflight phase, or upon activation of the second database.

The pilot may deselect as many as six stations.

R If the pilot attemps to deselect a navaid that has been previously
R deselected, the “XXX IS DESELECTED” message is displayed.

IRS MONITOR PAGE

This page displays the IRS data. The crew calls up this page by pressing the IRS monitor prompt of the DATA INDEX 1/2 page.



IRS IN NAV (DONE PHASE) — IRS IN ALIGN or ATT

TITLE DRIFT AT XXXX (amber)
Displays "DRIFT AT" runway identifier, if at least one IRS average drift is displayed.

[1L] to [3L] IRS 1(2) (3) (white)
These prompts access the associated IRS pages. Each label line displays the mode (NAV, ALIGN, ATT or INVAL), the average drift (upon transition to DONE phase), and the Time To Nav in minutes (if IRS in align) for each IRS.

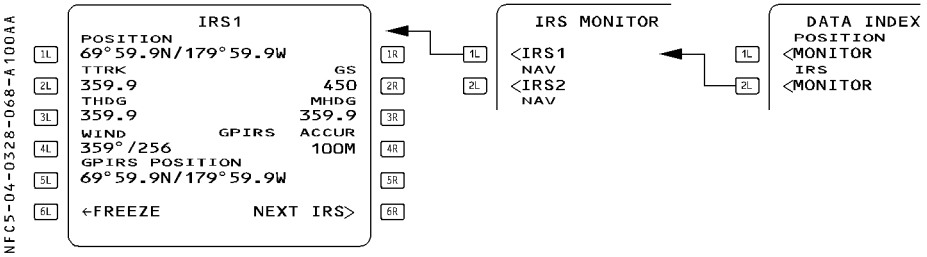
[1R] to [3R]
Displays the status message of the associated IRS in small green font.
List of available messages :

IR FAULT	CHECK C/B
DELAYED MAINT	CDU FAULT
ENTER PPOS	ENTER HEADING
SELECT ATT	REENTER PPOS
EXCESS MOTION	SYS BELOW – 15°
SWITCH ADR	

R [5R] SET HDG (white)
This field is displayed, if at least one IRS is in ATT mode.
This function allows initialization of a heading for IRS in ATT mode.
- If a heading has been entered in this field, or on the ADIRS panel, the value is displayed in blue.
- If not, amber boxes are displayed.

IRS 1 (2)(3) PAGE

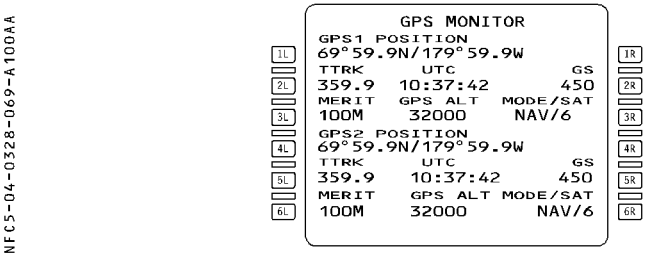
This page displays the IRS parameters and GPS/IRS hybrid parameters, if GPS is installed. The pilot calls up this page by pressing either the 1L key from the IRS MONITOR page, or the NEXT IRS prompt on another IRS page (closed loop).



TITLE	Displays the selected IRS in large white font. When data is frozen, IRS is replaced by "IRS FROZEN AT", followed by the time at which the pilot has frozen the display.
[1L] POSITION	Displays the latitude/longitude given by the selected IRS.
[2L] TTRK	True track
[3L] THDG	True heading
[4L] WIND	True wind direction/velocity
[5L] GPIRS	GPS/IRS hybrid position of the IRS
[6L] FREEZE/UNFREEZE	Allows the crew to freeze or unfreeze all data displayed on all three IRS pages. When the data is frozen, the title of the page specifies the time at which it was frozen. It is automatically unfrozen when exiting the page.
[2R] GS	Ground speed
[3R] MHDG	Magnetic heading
[4R] GPIRS ACCUR	GPS/IRS Figure of Merit (meters or feet)
[6R] NEXT IRS	This prompt enables another IRS page (closed loop IRS 1 → 2 → 3 → 1) to be displayed.

GPS MONITOR PAGE ◁

This page displays the GPS data. The pilot calls up this page by pressing the GPS MONITOR prompt of the DATA INDEX page.

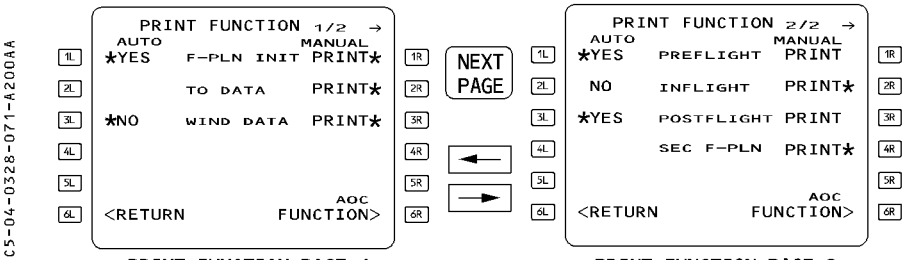


Line 1 and 4 GPS 1,2	POSITION
[2L] and [5L] TTRK	GPS 1, 2 true track
[3L] and [6L] MERIT	GPS 1, 2 figure of merit (meters or feet)
[2R] and [5R] GS	GPS 1, 2 ground speed
[3R] and [6R] MODE/SAT	GPS 1, 2 mode (INIT, ACQ, NAV, TEST, FAULT, AIDED or ALTAID) and Number of satellites tracked.
	INIT : System initialization
	ACQ : Satellite acquisition
	NAV : Normal mode
	TEST : System test
	FAULT : Invalid system
	ALTAID/ AIDED : Degraded modes. GPS uses aircraft inputs for computation purposes.
[2] and [5] UTC	: GPS 1, 2 UTC
[3] and [6] GPS ALT	: GPS altitude is displayed for information purposes. It is not used by the FMGS.

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PRINT FUNCTION PAGES

The PRINT FUNCTION pages enable the crew to print the data relative to the current flight.
This data comes from 2 different sources :
– ACARS uplink messages, and
– Active data from the current flight.
The pilot may access these pages from the "DATA INDEX" page1/2, by pressing the [6R] ACARS/PRINT FUNCTION key.



PRINT FUNCTION PAGE 1 PRINT FUNCTION PAGE 2

NFCS-04-0328-071-A200AA

PRINT FUNCTION PAGE 1/2

This page displays the status of the automatic printing capabilities, for the uplink messages (left column), and the status of the manual printing capabilities of the current active data (right column).

Left column

AUTO

* YES (blue)	Line 1 : Uplink messages related to flight plan INIT data are automatically printed when received. Line 2 : Uplink messages related to takeoff data are automatically printed when received. Line 3 : Uplink messages related to wind data are automatically printed when received.
NO (without an asterisk)	Automatic printing is internally deactivated for the data of the line. The pilot cannot reactivate it manually.
Blank	The ACARS function is not available for this line. Uplink messages can neither be received nor automatically printed.

Right Column

MANUAL — Displays the status of the manual printing capability of the active data (and not of the ACARS uplink data).

PRINT * (amber) — Pressing the right keys prints the following active data :
- Line 1 : Active flight plan init data
- Line 2 : Active takeoff data
- Line 3 : Active wind data

Printing is only possible, if the asterisk appears.
When the key is pressed, the asterisk disappears until the data is printed.

[6L] RETURN — Pressing this key reverts the display to the DATA INDEX page.

[6R] ACARS FUNCTION — Pressing this key reverts the display to the ACARS FUNCTION page.

PRINT FUNCTION PAGE 2/2

This page describes the printing capabilities of the reports displayed on lines 1 to 4.

Left column

AUTO (white)

* YES (blue) —
- Line 1 : The PREFLIGHT report is automatically printed at engine start.
- Line 2 : The INFLIGHT report is automatically printed at takeoff.
- Line 3 : The POSTFLIGHT report is automatically printed at engine shutdown.

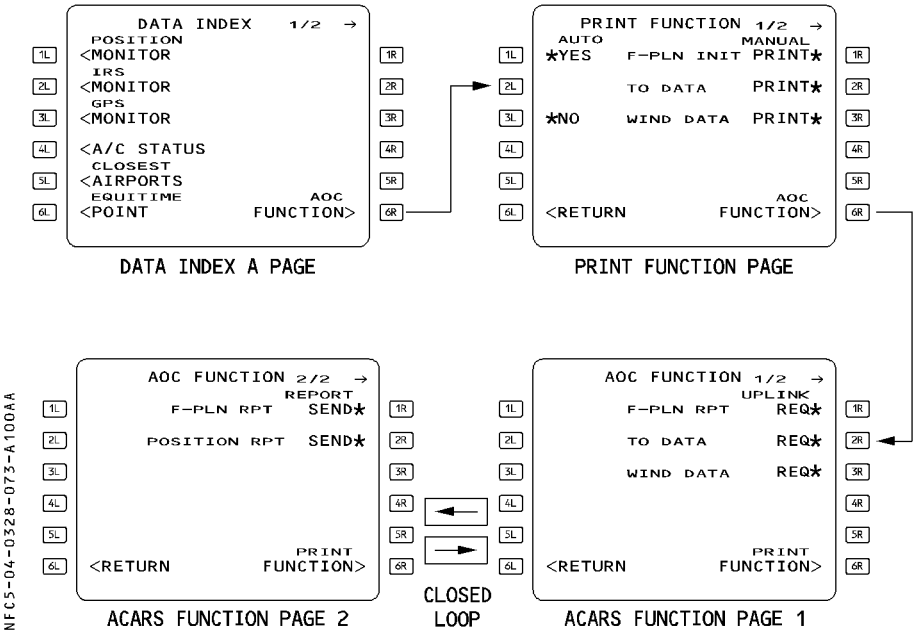
NO (without an asterisk) — Automatic printing is internally deactivated for the report. The pilot cannot reactivate it.

Right column

MANUAL
PRINT * — Pressing a right key prints the report displayed on the line.
It is not possible to print, if the asterisk does not appear.
When the key is pressed, the asterisk disappears until the report is printed.
Regarding the PREFLIGHT, INFLIGHT, and POSTFLIGHT reports :
Only one can be printed at a time, depending on the applicable flight phase.
For the SEC F-PLN report, the print selection start is only displayed if a secondary flight plan exists.

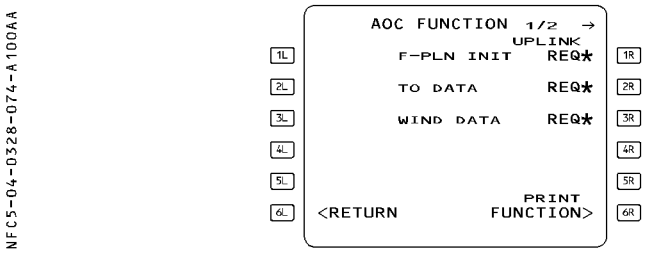
AOC FUNCTION PAGE ◁

The AOC FUNCTION pages display those functions which enable crews to send manual requests or reports to the ground.
All functions, displayed on pages 1 and 2, may be inhibited via a pin program.
The AOC/PRINT FUNCTION prompt is displayed on the DATA INDEX page 1/2. Pressing this key displays the PRINT FUNCTION page, from which the AOC FUNCTION page can be accessed.



The AOC function page 2 is accessed using the "→" or "←" keys from page 1 and vice versa.

AOC FUNCTION PAGE 1



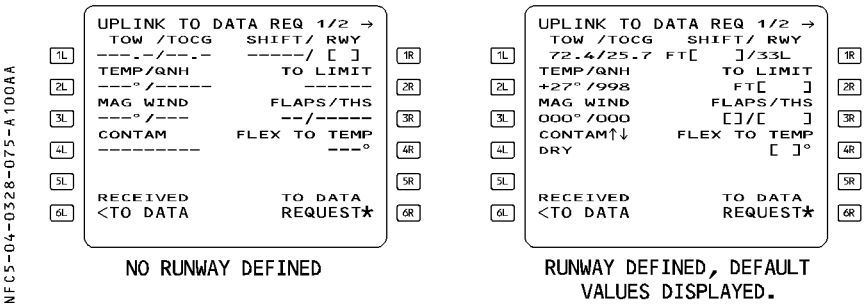
TITLE	AOC FUNCTION 1/2 is in white.
Line 1 F-PLN INIT REQ*	Pressing this key sends a flight plan request to the ground (downlink message). The INIT REQUEST prompt of the INIT A page provides the same function.
Line 2 TO DATA REQ*	Pressing this key sends a request for takeoff data. Displayed in the DONE and PREFLIGHT phases. The TO DATA REQUEST prompt of the UPLINK TO DATA REQ page provides the same function.
Line 3 WIND DATA REQ*	Pressing this key sends a request for wind data. The WIND REQUEST prompt of the CLIMB, CRUISE, and DESCENT WIND pages provides the same function.

Note : If "REQ" is not followed by an asterisk, the request cannot be sent (downlink message).
When a function (line 1 or 2 or 3) is deactivated internally, the corresponding line is blank.

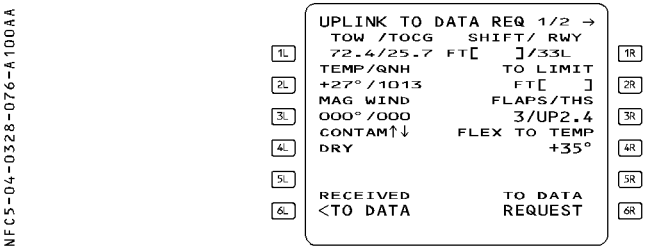
[6L] RETURN	The pilot presses this key to revert the display revert to the DATA INDEX page.
[6R] PRINT FUNCTION ◁	The pilot presses this key to access the PRINT FUNCTION page. (Refer to PRINT function page).

UPLINK TO DATA REQ PAGES

This page allows the pilot to send a request for takeoff data for up to 2 runways. There is one page for each runway. The page is accessed from the PERF TAKEOFF page, or from the UPLINK XXX (MAX or DRT or FLX) TO DATA page, by pressing the UPLINK TO DATA prompt.



TITLE	White.
[1L] TOW/TOCG (green)	This field is dashed, until a runway is defined in the [1R] field. The TOW/TOCG is defaulted to the values of the INIT B and FUEL PRED pages. If not available, dashes are displayed. It cannot be modified by the pilot.
[2L] TEMP/QNH or QFE (green/blue)	This field is dashed, until a runway is defined in the [1R] field; TEMP = Defaulted to SAT, and cannot be modified by the crew. BARO = Defaulted to FCU selection and can be modified by the pilot.
[3L] MAG WIND (blue)	This field is dashed, until a runway is defined in the [1R] field. It displays the wind at the origin. The pilot can modify this field.
[4L] CONTAM (blue)	This field is dashed, until a runway is defined in the [1R] field. The display is defaulted to DRY. The scroll keys are used to modify the runway contamination : DRY, WET, 1/4 WATER, 1/2 WATER, 1/4 SLUSH, 1/2 SLUSH, COMP SNOW.
[6L] RECEIVED TO DATA	This field calls up the UPLINK MAX (or FLX) TO DATA page that displays the data received by ACARS.



[1R] SHIFT/RWY (blue)
This field is dashed, until a runway is defined in the F-PLN. If a runway is defined in the F-PLN, it is automatically filled in as :
SHIFT = Value from the PERF TO page, or blue brackets [ ], if no value is defined.
RWY = F-PLN departure runway. The pilot can modify this field.

[2R] TO LIMIT (blue)
It is dashed, until a runway is defined in the [1R] field. It displays blue brackets [ ], when a runway is defined. The pilot may enter a length, considering runway obstacles.

[3R] FLAPS/THS (blue)
This field is dashed, until a runway is defined in the [1R] field ; it is then defaulted to values from the PERF TO page. Blue brackets are displayed, if the PERF TO page does not have any defined values.

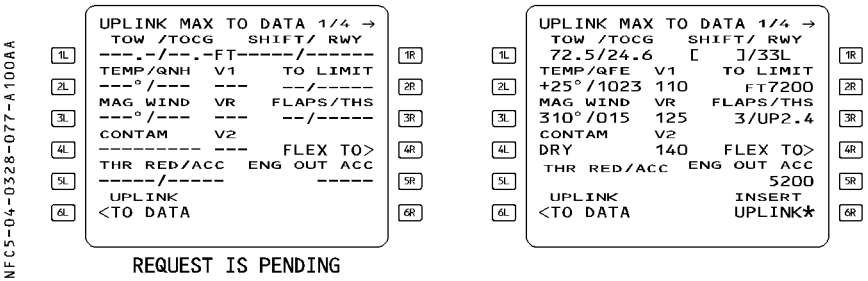
[4R] FLEX TO TEMP (blue)
This field is dashed, until a runway is defined in the [1R] field ; it is then defaulted to values from the PERF TO page. Blue brackets are displayed, if the PERF TO page does not have any defined values.
The pilot can modify this field and enter a FLEX TO temperature (FXX).

[6R] TO DATA REQUEST* (amber)
Pressing this key sends the takeoff data request message to the ground.
The asterisk disappears when the request is sent. It reappears when the data is available.

Page 2/2 is used for requesting a second runway data.

Note : If the UPLINK TO DATA REQ Page 2 is accessed (Page 1 being filled), the fields on this page are filled in with default values after entering of a runway in the [1R] field. QNH or QFE, and wind are common with Page 1.

UPLINK MAX TO DATA PAGES



This page is accessed from the UPLINK TO DATA REQ page by pressing the RECEIVED TO DATA key.

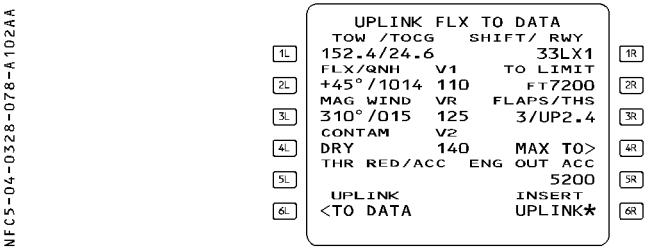
There is a set of 2 pages (MAX TO DATA and FLEX TO DATA) for each of the 4 uplinked runway data. Uplinked data is displayed in green. (It cannot be modified by the pilot).

[1L] TOW/TOCG	Uplinked reference Takeoff Gross Weight and Takeoff Center of Gravity.
[2L] TEMP/QNH (or QFE)	Uplinked assumed temperature and baro setting.
[3L] MAG WIND	Uplinked takeoff runway wind.
[4L] CONTAM	Uplinked takeoff runway contamination.
[5L] THR RED/ACC	Uplinked Thrust Reduction and Acceleration altitudes.
[6L] UPLINK TO DATA	Pressing the key calls up the UPLINK TO DATA REQ page
V1, VR, V2	Uplinked takeoff speeds.
[1R] SHIFT/RWY	Uplinked TO runway ident, runway intersection, and position shift.
[2R] TO LIMIT	Uplinked runway length remaining.
[3R] FLAPS/THS	Uplinked FLAPS/SLATS CONF and TRIM position.
[4R] FLEX TO	Pressing this key calls up the UPLINK FLEX TO DATA pages.
[5R] ENG OUT ACC	Uplinked engine-out acceleration altitude.

[6R] INSERT UPLINK* Uplinked Takeoff data is available for insertion.
Selecting this prompt inserts the following data in the PERF TO page :
– V1, VR, V2
– THR RED/ACC, ENG OUT ACC altitudes
– FLAPS/THS
– TO SHIFT
– FLEX
The display reverts to the PERF TO page, the star disappears.
This field is not displayed, if the runway does not match the active runway, or if the uplinked TOW/TOCG differs from the current TOW/TOCG (if they already exist). The "CHECK TAKEOFF DATA" message is displayed on the MCDU scratchpad.

Note : All previously received data is replaced by the new uplinked data.

UPLINK FLX TO DATA PAGES

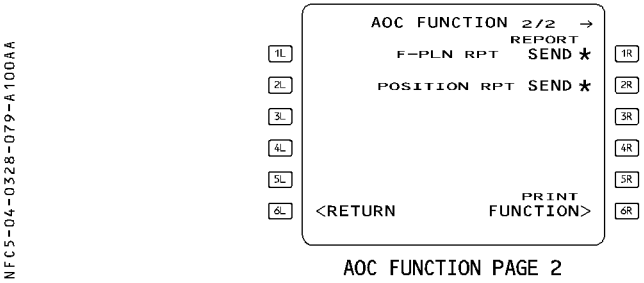


TITLE UPLINK FLX TO DATA in white.

[2L] FLX/QNH (or QFE)
When the UPLINK FLEX TO DATA page is selected, it displays uplink assumed Flex Temperature and baro setting (QNH or QFE).

[4R] MAX TO Pressing this key calls up the MAX TO DATA page.
For all other fields, refer to MAX TO DATA page.

AOC FUNCTION PAGE 2



AOC FUNCTION PAGE 2

Line 1 F-PLN RPT SEND — Pressing this key sends the flight plan report to the ground.

Line 2 POSITION RPT SEND — Pressing this key sends a Position Report to the ground.

Note : — *No report can be sent, if "SEND" is not followed by an asterisk.*
— *When a function (line 1 or 2) is deactivated via the navigation database policy file, the corresponding line is blank.*

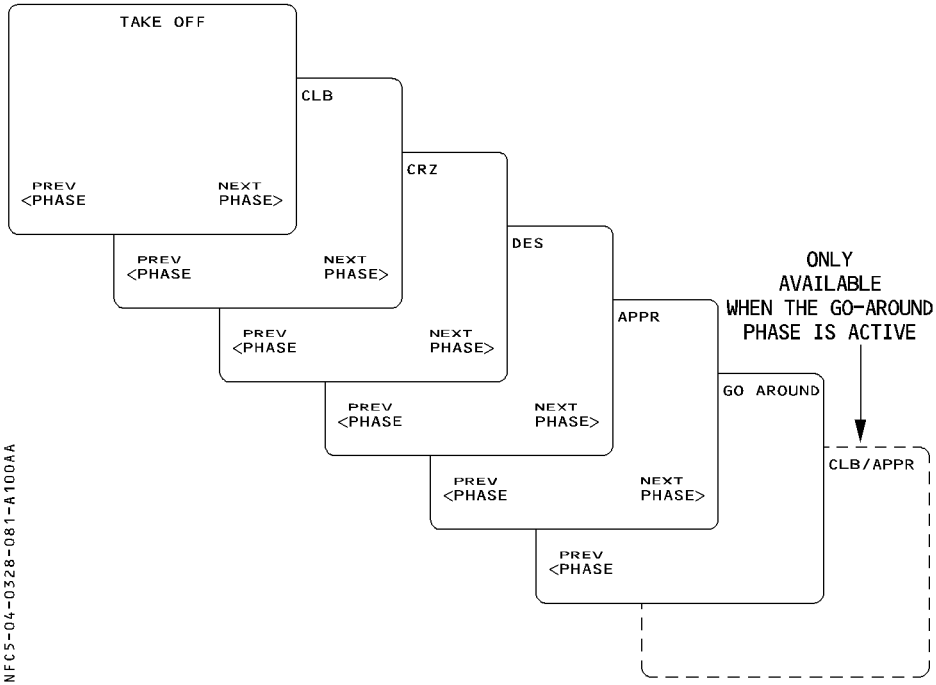
[6L] RETURN — The pilot presses this key to revert to the DATA INDEX page.

[6R] PRINT FUNCTION — The pilot presses this key to access the PRINT FUNCTION page.

INTENTIONALLY LEFT BLANK

PERF PAGE

The flight plan is divided into the following phases :
PREFLIGHT, TAKEOFF, CLIMB, CRUISE, DESCENT, APPROACH, GO-AROUND, DONE.
Each phase, except for the preflight and done phases, has a performance (PERF) page. The PERF pages display performance data, speeds related to the various phases, and predictions.
Pressing the PERF key on the MCDU console calls up the performance page for the current active phase. Performance pages, relating to phases already flown, are unavailable.
In the preflight and done phases, pressing the PERF key brings up the takeoff performance page.
Pressing the PERF key in the done phase makes the phase transition to the preflight phase.



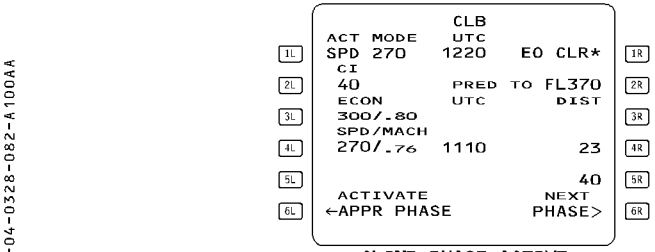
The FMGS flight phases are unrelated to the FWC flight phases.

Line 6	Fields may display two different prompts, depending upon whether the phase is active or not.
[6L] PREV PHASE	To review the performance page for the previous phase. The prompt is unavailable on the takeoff performance page. It is also unavailable for phases already flown.
[6L] ACTIVATE APPR PHASE	To activate, then confirm, the APPR phase. It is only available on the page corresponding to the active phase.
[6R] NEXT PHASE	To review the performance page for the next phase.

Note : "EO CLR" prompt*

- *When the FMGS detects an engine-out condition, the system automatically calls up the performance page for the current flight phase (except when this occurs before the diversion point during takeoff, or no EOSID exists in the flight plan), and displays "EO CLR*" in the [1R] field.*
  If the pilot presses the [1R] key, the system reverts to the normal processing (with no engine failed) and suppresses the EO information.
- *If the engine-out condition is detected before the diversion point at takeoff, a temporary flight plan is created.*

R

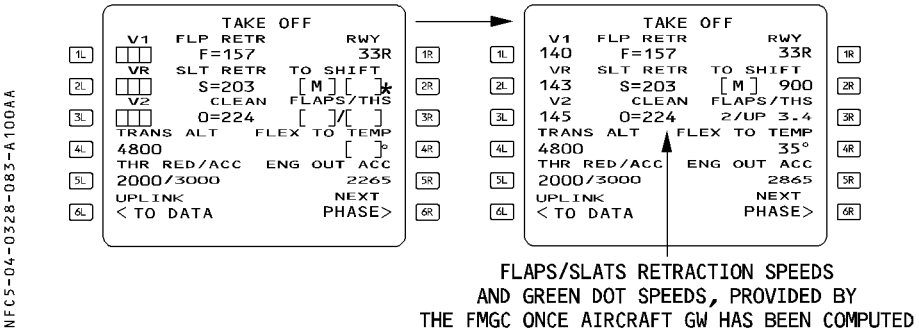


NFC5-04-0328-082-A100AA

CLIMB PHASE ACTIVE
ENGINE-OUT IS DETECTED

PERF TAKEOFF PAGE

During the preflight phase, the pilot presses the PERF key to call up the takeoff performance page.



NFC5-04-0328-083-A100AA

TITLE — TAKE OFF is in large green font when the takeoff phase is active, and in large white font when it is inactive.

R *Note : If the takeoff shift, or the flaps/THS, or the runway is changed after V1, V2 or*
R *VR insertion, but the origin airport remains the same, the MCDU "CHECK TAKEOFF DATA" message appears, but all takeoff parameters are retained (except in case of runway change : They are invalidated, but still displayed adjacent to each field. The "CONFIRM TO DATA" prompt in [6R] allows reverting to the previous valves).*

[1L] V1
[2L] VR
[3L] V2 — The boxes remain amber, as long as the pilot does not make entries in them. The pilot can modify any entry, as long as the takeoff phase is inactive.

Note : If the pilot does not enter V2, the SRS mode will be unavailable at takeoff.

[4L] TRANS ALT (transition altitude) — This field displays the navigation database default altitude (if defined), once the origin airport is entered. The pilot can modify it.

[5L] THR RED (thrust reduction altitude) — This is the altitude at which the pilot should reduce the thrust from TOGA/FLX to MAX CLIMB (CL detent) with all engines operative ("CLB" or "LVR CLB" flashing on the FMA).
- The thrust reduction altitude defaults to 1500 feet above the runway elevation, or to the altitude set by the airline.
- The pilot can modify this altitude : The minimum is 400 feet above the runway elevation.

ACC
(Acceleration altitude)

This is the altitude at which the climb phase is triggered.
- The target speed jumps to the initial climb speed.
- The default value is 1500 feet above runway elevation.
- The flight crew can modify the value. The minimum value is 400 feet above runway elevation, though it is always higher than, or equal to, THR RED.

Note :
- *A clearing action reverts both values to the defaulted ones.*
- *When the crew selects an altitude on the FCU that is below THR RED, it brings THR RED and ACC down to this altitude. (The 400 feet minimum still applies).*

[6L] UPLINK TO DATA

This key calls up the UPLINK TO DATA REQ page.
It is only displayed in the preflight and done phases.

[1R] RWY or EO CLR

This field shows the takeoff runway selected on the active flight plan. The flight crew cannot make an entry from this field. The field shows dashes, if no runway has been inserted in the flight plan. EO CLR is displayed when an engine-out is detected.

R R R R R R [2R] TO SHIFT

The takeoff shift is the distance in meters or feet between the beginning of the runway and the aircraft's takeoff position. When taking off from an intersection, the flight crew should insert this value to ensure a correct update of the FM position. The takeoff shift value must be positive, and cannot be greater than the runway length.

[3R] FLAPS/THS

This is an optional pilot entry for the positions of the flaps and the trimmable horizontal stabilizer (THS) at takeoff.
It is for information only (no action). The flight crew can modify it until takeoff, by entering "UP X.X" or "X.X UP", or "DN X.X" or "X.X DN" for the THS.

[4R] FLX TO TEMP or
DRT TO or FLX TO ◁

The pilot inserts the FLX TO temperature for FLX takeoff setting purposes, or a derated level (if installed). The pilot can only enter it during preflight. The system sends it to the FADEC and displays the entered data on the upper ECAM display. The TEMP value is always entered in degrees Celsius.

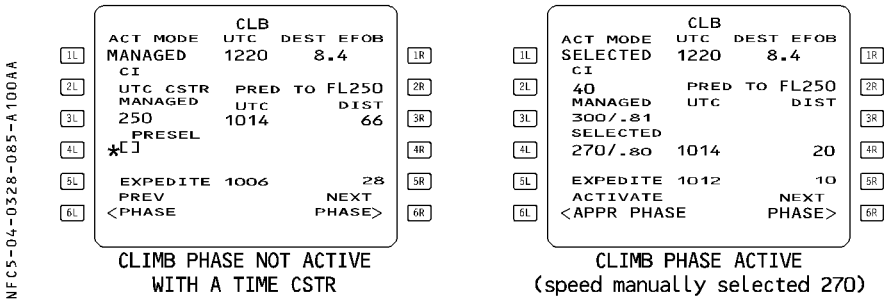
[5R] ENG OUT ACC

This field displays the engine-out acceleration altitude, as defined in the database, or is manually entered by the flight crew. This is for display only, as a reminder. It cannot be cleared.
The above ACC altitude rules of [5L] apply to this field.

[6R] NEXT PAGE
or
CONFIRM TO DATA*

This key calls up the climb performance page, or allows the pilot to revert to the previously-entered T.O. parameters, in case of runway change with the same origin airport.

PERF CLIMB PAGE



CLIMB PHASE NOT ACTIVE
WITH A TIME CSTR

CLIMB PHASE ACTIVE
(speed manually selected 270)

TITLE — CLB is displayed in large green font when climb phase is active, and in large white font when it is inactive.

[1L] ACT MODE — This field displays the preselected or active speed mode : SELECTED or MANAGED. The pilot cannot modify it from this field.

[2L] CI (Cost Index) — This field displays the cost index, as initialized on the INIT A or defaulted from the database, or inserted in this field by the pilot.

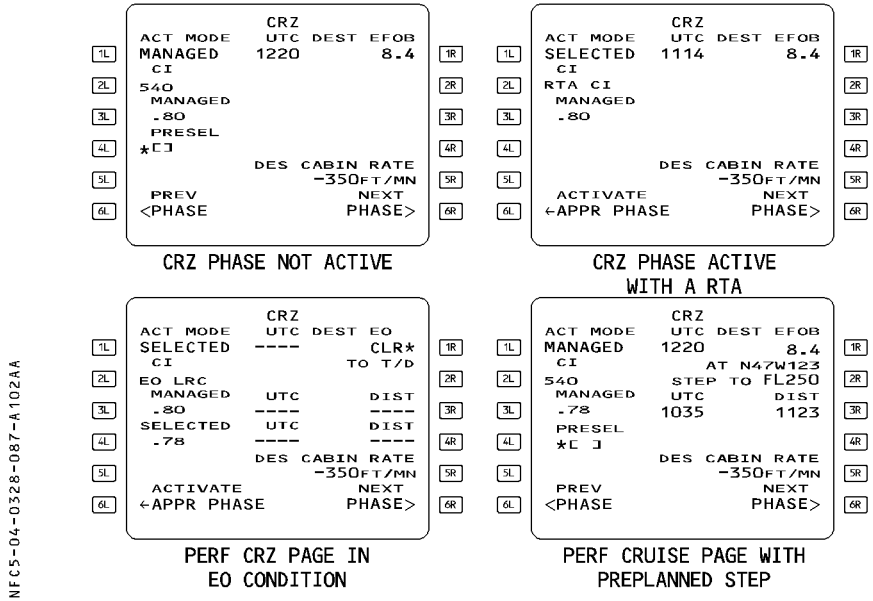
R
R UTC CSTR automatically replaces the cost index value, if a time constraint exists in the F-PLN.

Note : In case of an engine-out, EO LRC (engine-out long range cruise) replaces the CI field.
You can enter a cost index and overwrite EO LRC. In this case, clearing the cost index reverts to EO LRC.

[3L] MANAGED — This field displays the FMGS computed ECON speed/Mach (Refer to 4.02.20).
Before the CLIMB phase is active, if the preselected speed mode is SELECTED, an asterisk appears next to the MANAGED speed. In this case, pressing the 3L key preselects MANAGED speed, and 4L reverts to brackets.

[4L] PRESEL or SELECTED	<u>If the climb phase is active :</u> The title of this field becomes "SELECTED". This field displays the selected (or preselected) SPD or MACH target. The pilot cannot modify this field directly, but can adjust it with the FCU's SPD/MACH selection knob. If the pilot pushes in the FCU's SPD/MACH selection knob to revert to managed speed, the system selects (or reselects) ECON SPD/MACH, and [4L] is blank. <u>If the climb phase is inactive :</u> This field displays PRESEL, as long as the climb phase is inactive. The pilot can only enter a preselected speed.
[5L] Blank or EXPEDITE	This field is blank, as long as the aircraft is in preflight. This field displays this legend, when the takeoff or climb phase is active. It indicates the time and distance required to reach the altitude displayed in the 2R field, in case of climb at green dot.
[6L] PREV PHASE	This field displays this legend, if the climb phase is inactive. The pilot presses this key to call up the takeoff page.
[6L] ACTIVATE APPR PHASE	The field displays this legend, if the climb phase is active. Pressing this key once displays "CONFIRM APPR PHASE*". Pressing it again activates the approach phase.
[1R] DEST EFOB	This field displays the predicted fuel on board at destination, in green font.
EO CLR	In case of engine-out the [1R] field displays the EO CLR prompt.
[2R] PRED TO...	This field displays the target altitude for the predictions shown in the 3R, 4R, or 5R field. It defaults to the FCU altitude, but the pilot can modify it to any altitude below MAX ALT.
[3R] [4R] [5R]	These fields show time and distance predictions for the target altitude selected in [2R], computed for the current vertical mode and speed mode (MANAGED, SELECTED, or EXPEDITE). These fields are only displayed while the takeoff, or climb phase is active.
[6R] NEXT PHASE	The pilot presses this key to call up the PERF CRZ page.

PERF CRUISE PAGE



NFC5-04-0328-087-A102AA

TITLE — CRZ is in large green font, when the cruise phase is active, and in large white font, when it is inactive.

[1L] ACT MODE — This field shows the preselected or active speed mode : SELECTED or MANAGED.
The pilot cannot modify it from this field.

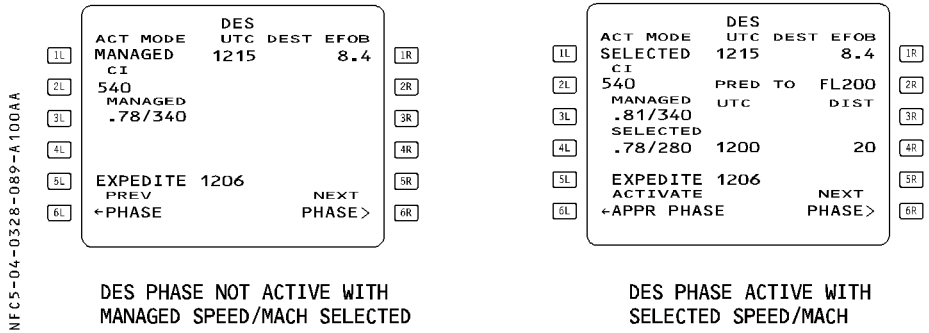
[2L] CI — This field shows the cost index, as initialized on the INIT A page or defaulted from the database, or as inserted in this field by the crew.
RTA CI automatically replaces the cost index value, if a RTA exists in the F-PLN.
EO LRC automatically replaces the cost index value in case of an engine-out.

[3L] MANAGED — This field displays the FMGS-computed ECON speed/Mach (Refer to 4.02.20).
Before the CRUISE phase is active, if the preselected speed mode is SELECTED, an asterisk appears next to the MANAGED speed. In this case, pressing the 3L key preselects MANAGED speed, and 4L reverts to brackets.

[4L] PRESEL — <u>If the cruise phase is active :</u>
This field is blank.
<u>If the cruise phase is inactive :</u>
The pilot can enter a preselected speed or Mach number.

[6L] PREV PHASE or	The pilot can press this key to call up the climb page, if the cruise phase is not yet active.
[6L] ACTIVATE APPR PHASE	This field displays this legend, if the cruise phase is active. The flight crew presses this key once to change the legend to "CONFIRM APPR PHASE*". A second press activates the approach phase. *Note : If the pilot inadvertently activates the approach phase, he can reselect the cruise flight level from the progress page, in order to reactivate the cruise phase.*
[1R] TIME/UTC DEST EFOB	Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field automatically displays the predicted arrival time (UTC) at destination. After takeoff, it displays the predicted arrival time (UTC) and the remaining fuel on board (DEST EFOB) at destination, in green font. EO CLR is displayed when an engine-out is detected.
[2R] STEP TO FL XX, or TO T/D	This field, in combination with 3R and 4R, displays the predictions for the step point and step altitude, or the Top of Descent.
[3R] and [4R] TIME/UTC and DIST	These fields display the time and distance to go to the various points identified in the 2R field.
[5R] DES CABIN RATE	This field displays Max [computed DES cabin rate, maximum descent cabin rate]. The pilot may modify the value : The FM then recomputes the top of descent, in order to match this value. If the FM cannot match the pilot's entry, the FM-computed value overwrites the pilot's entry. A clear action reverts to the default value (– 350 feet per minute). DES CAB RATE being a negative value, "minus" is not a necessary entry.
[6R] NEXT PHASE	This key calls up the DES page.

PERF DESCENT PAGE



NFC5-04-0328-089-A100AA

TITLE — DES is in large green font if the descent phase is active, and in large white font if it is inactive.

[1L] ACT MODE — This field displays the preselected or active speed mode (MANAGED or SELECTED). The flight crew cannot modify it from this field.

[2L] CI — This field displays the cost index, as initialized on the INIT A page or defaulted from the database, or inserted in this field by the flight crew. UTC CSTR automatically replaces the cost index value, if a time constraint exists in the F-PLN. The flight crew cannot modify in descent/approach phase below the descent speed limit altitude, or FL100, whichever is higher.

[3L] MANAGED

<u>If the descent phase is active :</u>

The flight crew cannot make an entry in this field.

The field displays the ECON speed/Mach or the speed/Mach value, previously entered by the pilot.

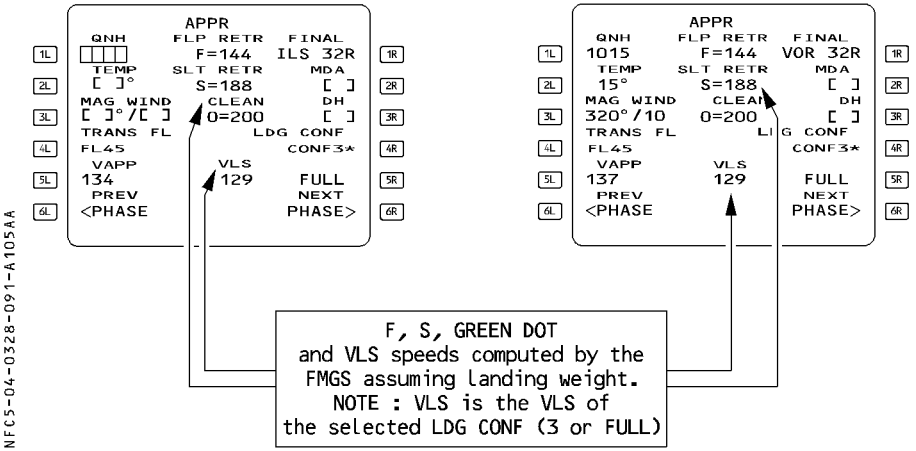
<u>If the descent phase is inactive :</u>

Before the flight crew makes any entry, this field displays “MANAGED” in white, with the associated ECON descent Mach or speed, in blue. The crew may overwrite the ECON descent Mach or speed, by entering a Mach number or a speed in this field. The system uses the pilot’s entry to compute the descent profile. The descent may be flown in managed, using this new pilot entry.

The entry is modifiable. It can be cleared to revert to ECON speed/Mach.

[4L] blank or SELECTED	<u>If the descent phase is inactive, or the descent phase is active but the active speed mode is MANAGED :</u> This field is blank. <u>If the descent phase is active, and the active speed mode is SELECTED :</u> The field displays the speed or Mach target manually selected by the pilot. "SELECTED" is displayed in the [1L] field. To modify the field value, the pilot uses the FCU's SPD/MACH selector knob. The [4L] field and FCU window will display the same value. Pushing in the FCU speed selector knob activates the managed SPD/MACH target displayed in the [3L] field.
[5L] Blank or EXPEDITE	If the descent phase is inactive, this field is blank. Displays this legend, if the descent phase is active. It indicates the time and distance required to reach the altitude displayed in the 2R field at MMO/VMO speed. The pilot cannot select the EXPEDITE mode from this field.
[6L] PREV PHASE or ACTIVATE APPR PHASE	This key calls up the cruise phase page, if the descent phase is not yet active. Displayed, if the descent phase is active. Pressing this key once makes "CONFIRM APPR PHASE" appear. A second press activates the approach phase.
[1R] TIME/UTC DEST EFOB	Before takeoff, this field displays the flight time to destination and the predicted remaining fuel on board. If the crew enters an estimated takeoff time, the field automatically displays the predicted arrival time (UTC). After takeoff, it displays the predicted arrival time at destination (UTC) and the remaining fuel on board (DEST EFOB) at destination, in green font. EO CLR is displayed when an engine-out is detected.
[2R] PRED TO...	This field displays the target altitude for the predictions in [3R], [4R], or [5R]. The display defaults to the FCU-selected altitude. The flight crew can modify it to any altitude lower than the present altitude.
[3R] [4R] [5R]	These fields display time and distance predictions down to the target altitude selected in [2R], computed for the current vertical mode (DES or OP DES, EXPEDITE) and the indicated speed mode (MANAGED, SELECTED, or EXPEDITE).
[6R] NEXT PHASE	The pilot presses this key to call up the PERF APPR page.

PERF APPR PAGE



NFCS-04-0328-091-A105AA

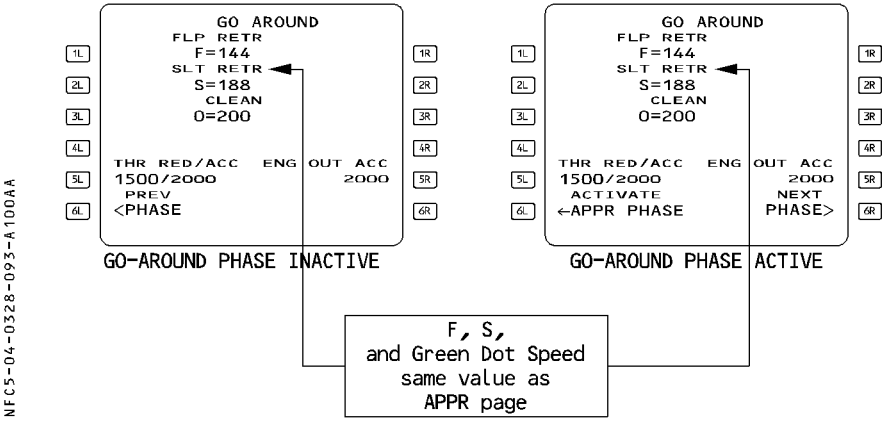
TITLE — APPR is in large green font, if the approach phase is active, and in large white font, if it is inactive.

[1L] QNH — This field displays brackets, when the aircraft is more than 180 NM from the destination. Inside 180 NM, a mandatory amber box appears. The crew must enter the QNH, either in hPa (three or four digits), or in inches of mercury (two digits, decimal point, and two more digits).
The system interprets :
. "1003", as 1003 hPa
. "29.92", as 29.92 inches.
The crew can modify this entry at any time.
The system uses the QNH value to compute the cabin repressurization segment, and the optimum descent profile.

[2L] TEMP — This field displays the temperature at destination. It displays brackets until the crew enters the temperature. The crew can modify this figure.
The system uses this temperature to refine its computation of the descent profile (ISA model).

[3L] MAG WIND or TRUE WIND	In this field, the flight crew enters the magnetic wind at the destination in knots. The system transmits any entry made in this field to the vertical revision and flight plan B pages (which display wind direction as true, not magnetic).
[4L] TRANS FL	Displays the Transition Level, computed by the FMS based on the Transition Altitude (extracted from the database) and the QNH value entered in the [1L] field. It is rounded to the upper multiple of 5. By default, it is displayed in small blue font. The crew can modify it (it is then displayed in large blue font).
[5L] VAPP	The FMGC computes this approach speed, using the formula: VAPP = VLS + 1/3 of the headwind components (limited to VLS + 5 as a minimum and VLS + 15 as a maximum). The flight crew can modify VAPP. A clear action reverts VAPP to the computed value. *Note : VLS = 1.23 VS1G of the selected landing configuration (FULL or 3).*
[6L] PREV PAGE	This field displays this legend, if the approach phase is inactive. Pressing this key calls up the descent performance page.
[1R] FINAL	Displays the approach specified in the flight plan. The flight crew cannot modify it from this field.
[2R] MDA/MDH	Displays the minimum descent altitude (or minimum descent height, if the QFE pin program is activated), with associated brackets. The flight crew inserts the value, that they can modify at any time. If the flight crew makes an entry in the [3R] field, or changes the approach, it clears this figure.
[3R] DH	If the flight plan includes an ILS approach, this field displays "DH" and empty brackets. The flight crew inserts the decision height. The system will accept an entry of "NO". If the flight crew inserts an MDA or an MDH, this erases the decision height, and the field reverts to brackets. The DH range is from 0 to 700 feet.
[4R] LDG CONF CONF 3	The flight crew can select configuration 3 by pressing the 4R key. This moves the asterisk down to the [5R] field, that displays "FULL".
[5R] FULL	The flight crew can use this key to select configuration FULL when necessary configuration FULL is the default landing configuration.
[6R] NEXT PHASE	Pressing this key calls up the PERF GO AROUND page.

PERF GO AROUND PAGE



NFC5-04-0328-093-A100AA

TITLE — GO AROUND is in large green font, if the go-around phase is active ; it is in large white font, if it is inactive.

[5L] THR RED ACC — This field displays the thrust reduction altitude and the acceleration altitude.

Thrust reduction altitude :

- Altitude at which thrust must be reduced from takeoff/go-around thrust to maximum climb thrust.
- "CLB" or "LVR CLB" flashing on the flight mode annunciator.
- Defaults to 1500 feet above destination runway elevation, or to the altitude set by the airline.
- Can be modified by the crew (minimum 400 feet above destination runway elevation).

Acceleration altitude :

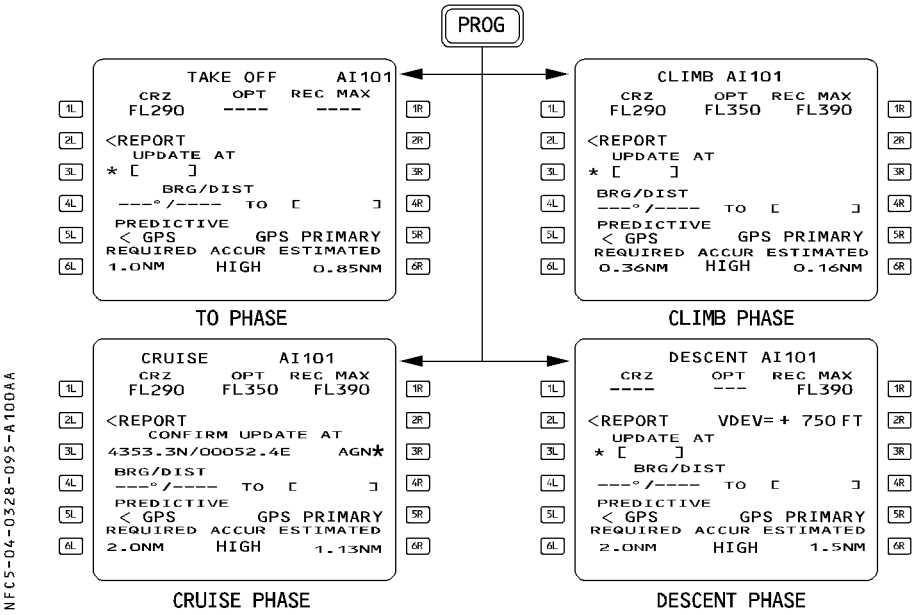
R
R
R
- The target speed does not automatically increase to Green Dot speed when climbing through the GA accel. altitude. The pilot has to manually select OPEN CLB mode.
- Defaults to 1500 feet above the destination runway elevation, or to the altitude set by the airline.
- Can be modified by the crew, but is always equal to or higher than the thrust reduction altitude.

[6L] PREV PHASE or	This field displays this legend, if the go-around phase is inactive. Pressing the key calls up the PERF APPR page.
ACTIVATE APPR PHASE	This field displays this legend, if the go-around phase is active. Pressing it once makes "CONFIRM APPR" appear. A second press activates the approach phase.
[5R] ENG OUT ACC	This display has the same characteristics as the display beside the 5R key on the takeoff page. It is for display only, and the pilot can modify it.
[6R] NEXT PHASE	Pressing this key calls up the PERF APPR page.
[IR] Blank or EO CLR*	This field is normally blank. EO CLR* is displayed when the GO AROUND phase is active, and an engine-out condition is detected.

Note : When the go-around phase is active, if the pilot enables ALTN or if the pilot inserts a new destination in the active flight plan, the go-around phase automatically shifts into the climb phase. (The target speed jumps from green dot speed to initial climb speed).

PROG PAGES

The progress page is a multifunction page that enables the pilot to :
- Select a new cruise flight level ;
- Crosscheck the navigation accuracy of the Flight Management (FM) system and validate it ;
- Update the FM position ;
- Monitor the descent.



NFCS-04-0328-095-A100AA

TITLE — Different for each flight phase (see above). The vertical phase is in large green font. The flight number is in large white font. EO is large amber font, if the engine-out condition is detected.

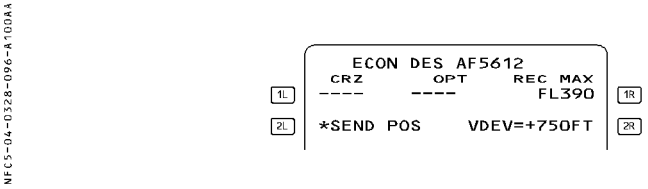
Line 1 CRZ (blue) — This line displays the cruise flight level, inserted on the INIT A page or directly in this field in blue. If the FCU is used to select an altitude that is higher than the one displayed, the system changes the displayed number to match the one selected by the FCU. In this line, the flight crew cannot insert a flight level that is lower than the FCU-selected altitude.
This field shows dashes when the descent or approach phase is active.

OPT — This field displays the optimum flight level (in green), that is computed based on the current gross weight, cost index, temperature, wind and a minimum estimated cruising a time of 15 minutes.
It displays dashes if an engine-out is detected :

REC MAX — This field displays the recommended maximum altitude (in magenta), that is computed based on the current gross weight and temperature. It provides the aircraft with a 0.3 g buffet margin, a minimum rate of climb at MAX CL thrust, and level flight at MAX CRZ thrust. This field is limited to FL 398.
If one engine is out, this field displays the recommended maximum engine-out altitude, that is computed based on the long-range cruise speed and assuming that anti-ice is off.

[2L] REPORT — This key calls up the REPORT PAGE.

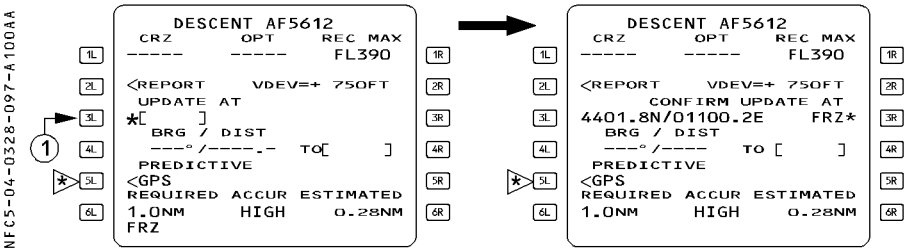
R [2R] VDEV — This field is displayed during the descent and approach phases, when
R NAV mode is engaged, or in HDG mode, provided that the crosstrack
R error (XTK) is less than 5 NM. It displays the vertical deviation
R between the aircraft's current altitude and the FMS-computed vertical
R profile.



NFCS-04-0328-096-A100AA

Line 3
UPDATE AT — The flight crew can update the FMS position via this field by entering either the ident of a waypoint, a NAVAID, an airport, a latitude and longitude (L/L), a place/bearing/distance (PBD), or a place-bearing/place-bearing (PB/PB).
When the flight crew has entered this data, this field changes its format to : "CONFIRM UPDATE AT", followed by the latitude/longitude and ident of the inserted position with an asterisk.
The flight crew presses the right-hand key adjacent to the asterisk to confirm the update, when the aircraft overflies the inserted position.

Note : If no ident has been inserted, the field displays "ENTRY", instead of an ident.



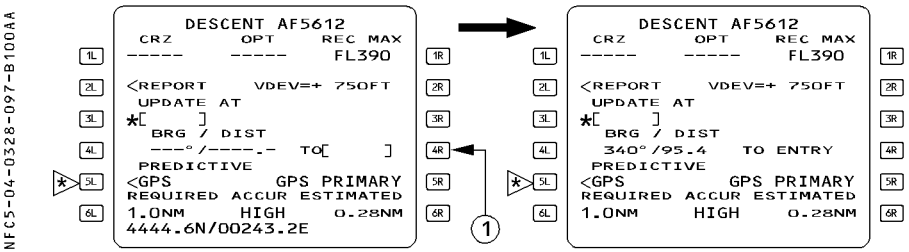
Line 4 BRG/DIST

On this line, the pilot can enter an airport, a waypoint, a navaid, or a runway. The pilot may enter each as an ident, a latitude/longitude (L/L), a place/bearing/distance (PBD), or a place-bearing/place-bearing (PBX). The field then shows the FMGC-computed bearing and distance from this site to the aircraft's present position. The last distance digit is in 1/10 of a NM. If it does not have an ident, the point is called "ENTRY".

Example :

BRG/DIST

340°/95.4 to ENTRY

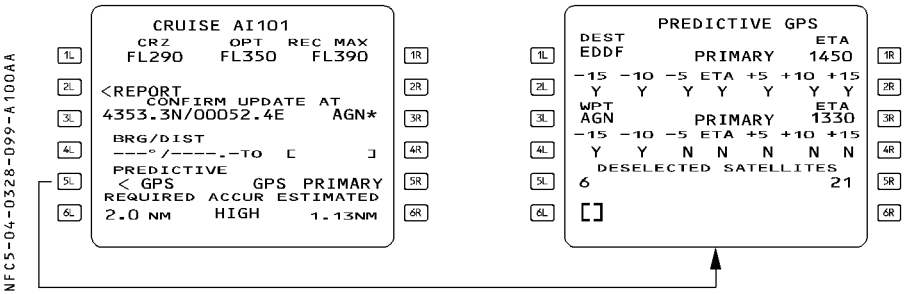


[5L] PREDICTIVE GPS ◁	This prompt gives access to the PREDICTIVE GPS page.
[5R] GPS PRIMARY ◁	This prompt is displayed when the FMS navigation mode is GPS PRIMARY. This field is blank, when GPS PRIMARY is unavailable, or the navigation mode is not GPS/IRS. When the GPS PRIMARY function is not embedded, this field displays : – The "REQD DIST TO LAND = " – The "DIR DIST TO DEST = " The scratchpad displays the relevant "GPS PRIMARY" message when this prompt appears, and "GPS PRIMARY LOST" when the field goes blank.
[6L] REQUIRED	This field displays the default value for the required navigation accuracy level. The pilot can modify it. Provided no pilot entry has been made, the default value changes according to the actual flight area (enroute, terminal, approach ; See 1.22.20).
ACCUR HIGH/LOW	This field shows the flight management system's estimate of navigational accuracy. "HIGH" indicates that the FMS estimates that the navigational accuracy matches the accuracy criteria of the currently flown area. "LOW" indicates the criteria is not matched.
[6R] ESTIMATED	This field displays the current estimated navigation accuracy value (EPE), as computed by the FMS.

PREDICTIVE GPS PAGE ◁

Note : This page is only operative with Honeywell GPS. All fields are dashed with GPS Litton.

The pilot accesses this page by pressing the PREDICTIVE GPS prompt of the PROG page. This page displays information relative to predictive availability of GPS PRIMARY at destination and at any waypoint selected by the crew.



[1L] DEST — This field displays the destination airport, as currently selected in the active flight plan. It cannot be modified. Dashes appear in this field, when no destination airport exists.

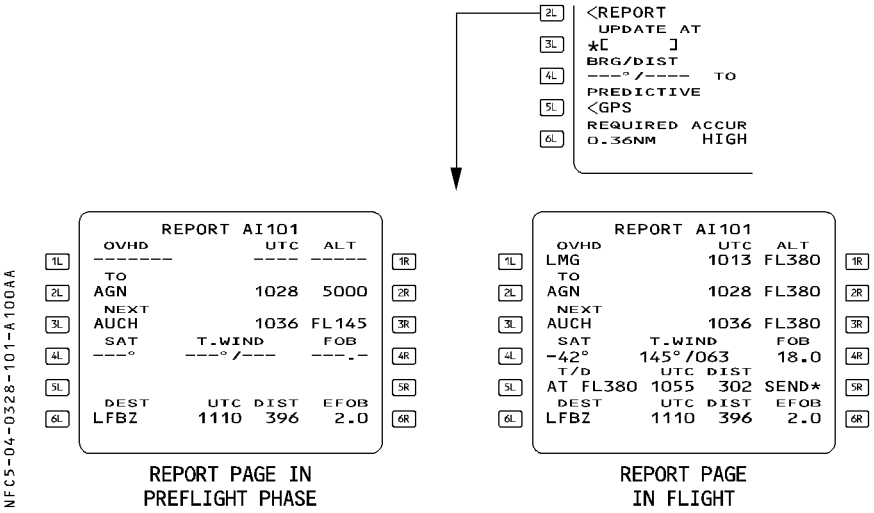
[1R] ETA — This field is defaulted to the estimated arrival time, as computed by the FMS (small blue font). The pilot may enter a value in this field (large blue font). Amber boxes are displayed when no prediction exists, or when the crew entry has been cleared.

Line 2 PRIMARY Y/N — This line shows the predicted primary status at the destination airport for the following times :
Estimated time of arrival ± 5, 10, 15 minutes.
Availability of GPS PRIMARY at the corresponding times, is indicated by Y, if PRIMARY is predicted to be available and by N if GPS PRIMARY is predicted to be unavailable.
These fields are blank, when the destination [1L], or time [1R] field is not defined.

[3L] WPT	The pilot may enter a reference waypoint in this field. Blue brackets appear, when no entry has been made.
[3R] ETA	When a reference waypoint has been entered in the [3L] field, amber boxes appear. The crew is prompted to enter a reference time in this field.
Line 4 PRIMARY Y/N	Information equivalent to [2L] / [2R] is displayed for any pilot-selected waypoint. The corresponding arrival time is also displayed.
Line 5 DESELECTED SATELLITES and Line 6 SATELLITES	This line enables the pilot to deselect up to four satellites by inserting the corresponding satellite number. This number then appears in large blue font. When deactivated, the satellites are not considered for predictive GPS availability at the destination or at a selected waypoint. The deselection is cancelled when the entry is cleared (blue brackets appears), or when the field is overwritten by a different satellite number.

REPORT PAGE

The pilot calls this page by pressing the [2L] key on the PROG page :



REPORT PAGE IN PREFLIGHT PHASE

REPORT PAGE IN FLIGHT

NFCS-04-0328-101-A100AA

This page displays information related to the FROM, TO, NEXT, and DEST waypoints, as well as the current wind, temperature, distance and time to the next cruise profile change.

TITLE (White) — This field indicates the flight number. If an engine-out is detected, this line shows "EO" in amber.

[1L] OVHD (green) — Displays the last sequenced waypoint. This field never displays the pseudo-waypoints and the F-PLN markers (T-P, PPOS, IN-BND, OUT-BND).

[1R] UTC/TIME ALT (green) — Displays the time and altitude recorded at the time of sequence.

[2L]-[2R] TO (green) — Displays the active waypoint, predicted time of arrival, and predicted altitude at this waypoint.

Note : Time and altitude values are identical to those values on the F-PLN pages.

[3L]-[3R] NEXT (green) — Same information for the next waypoint.

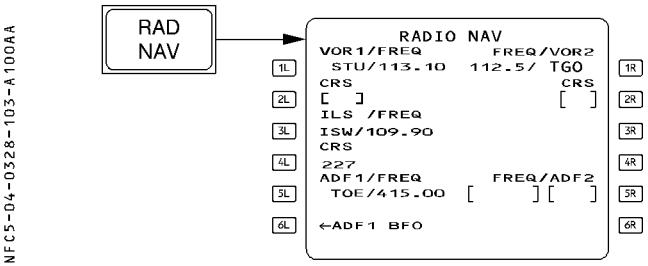
[4L] [4R] SAT/T.WIND/FOB (green)	This field displays the static air temperature, the wind direction and velocity, and the FOB recorded at waypoint sequencing.
[5L] T/D/UTC/DIST (green)	This field displays the estimated time, and the distance to go to the next change of the cruise profile (T/D, S/C, S/D). This data is only displayed if the cruise phase is active.
[5R] SEND* (blue)	The crew uses this prompt to downlink a position report. This field may be blank, depending on airline policy.
Line 6 DEST/UTC/DIST/EFOB	This field displays the estimated time of arrival, the distance along the F-PLN, and the estimated fuel on board at destination. This display is identical to the information on the F-PLN pages.

Note : No data can be inserted or modified on the REPORT page.

RADIO NAV PAGE

This page enables the pilot to select or verify the radio navaids, tuned for display purposes only.
These navaids include : VOR, VOR/DME, TAC, VORTAC, ILS, and ADF.
If either RMP is set on NAV, this page is blank on both MCDUs.

R



NFC5-04-0328-103-A100AA

Line 1 VOR1/FREQ FREQ/VOR2	This line displays the identifiers and frequencies of VORs 1 and 2, whether they are automatically or manually tuned. To manually tune a VOR, the pilot inserts the ident or frequency. If the ident is not in the database, the new navaid page comes up. A “clear” action reverts the selection to the autotuned navaid.
Line 2 CRS	This line displays courses for the navaids in Line 1. The pilot can manually enter the courses from these fields.
[3L] ILS/FREQ	This field displays the ident and frequency of an ILS. It is autotuned, if the ILS is associated with the departure runway, or if the flight plan shows an ILS approach selected for the destination. The ILS may also be entered manually. When the manually-entered ILS differs from the ILS that would be autotuned, “RWY–ILS MISMATCH” appears.
[4L] CRS	This field displays the course associated with the ILS in Line 3. It comes up automatically if an ILS is autotuned, or if an ILS has been manually tuned via its ident. Otherwise, the course must be entered manually. The course is or frontbeam (Fxxx) only.

R	[4R] SLOPE CRS ◁	In this field, the pilot enters the slope and course of the MLS. The course may be backbeam (Bxxx) or frontbeam (Fxxx).
	Line 5 ADF1/FREQ FREQ/ADF2	This line displays the identifiers and frequencies of ADFs 1 and 2. The pilot can use the ident or the frequency to manually tune the ADF.
	Line 6 ADF1/BFO BFO/ADF2	When an ADF is selected, these fields display an ADF/BFO prompt. The flight crew presses this key once to erase the arrow and revert ADF to BFO mode. A clear action recalls the arrow, and cancels BFO.

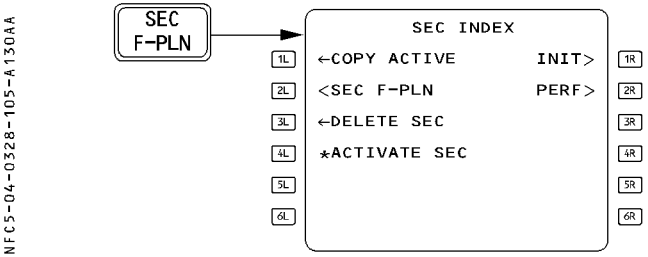
Note : — *The autotune function only works for navaids stored in the database.*
— *When tuning manually, the Operator should use the ident, rather than the frequency, unless the navaid is not in the database.*
— *Manually-tuned frequencies are displayed in large font.*

SECONDARY PAGES

The SEC F-PLN key on the MCDU console allows the crew to call up the secondary index page and the secondary flight plan page. The secondary flight plan is generally used to prepare a diversion, an alternate routing for predictable runway changes at takeoff or landing, or for training.
There are two types of secondary index page, depending on whether a secondary flight plan has already been defined.

SECONDARY INDEX PAGE

A SECONDARY FLIGHT PLAN IS ALREADY DEFINED

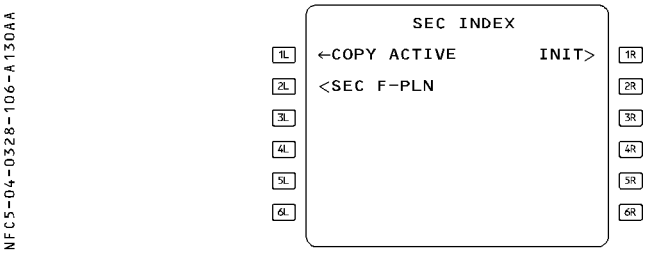


[1L] COPY ACTIVE (blue)	The pilot presses this key to copy the active flight plan into the secondary flight plan, and to erase the previous secondary plan.
[2L] SEC F-PLN (white)	The pilot presses this key to call up the secondary flight plan pages.
[3L] DELETE SEC (blue)	The pilot presses this key to delete the current secondary flight plan.
[4L] ACTIVATE SEC (amber)	The pilot presses this key to activate the secondary flight plan as the active flight plan.

Note : When flying in NAV mode, it is not possible to activate the SEC F-PLN, if the first leg of the SEC F-PLN is not compatible with the current active leg : If the crew presses the "ACTIVATE SEC" prompt, the SEC F-PLN activation is rejected and the "SELECT HDG/TRK FIRST" message is displayed in the scratchpad.

[1R] INIT (white)	This prompt is always displayed. It gives access to the SEC INIT A and B pages :
[2R] PERF (white)	The pilot presses this key to call up the performance pages of the secondary flight plan. When the active flight plan has been copied, this prompt only appears if the first lateral leg of the secondary flight plan is identical to the active leg of the primary flight plan.

A SECONDARY FLIGHT PLAN IS NOT DEFINED



[1L] COPY ACTIVE (blue)	The pilot presses this key to copy the primary active flight plan into the secondary flight plan.
[2L] SEC F-PLN (white)	The pilot presses this key to call up the secondary flight plan pages.
[1R] INIT (white)	This prompt allows access to the SEC INIT A and B pages. It is similar to the active INIT page, but blue brackets replace all the amber boxes.

SECONDARY FLIGHT PLAN PAGES

The secondary flight plan pages A and B are identical to those of the active flight plan. They are automatically sequenced, only when the secondary is copied from the primary and their active legs are identical.
The active and secondary flight plan pages differ from one another as follows :

Secondary lateral revision pages :
- ERASE and INSERT are not displayed.
- OFFSET and RADIAL FIX INFO are not available.
- A lateral revision of the secondary flight plan does not create a temporary flight plan : All revisions are directly applied to the secondary flight plan.

Secondary vertical revision pages :
- A vertical revision of the secondary flight plan does not create a temporary flight plan.

Secondary INIT A and B pages :
- Blue brackets, instead of amber boxes, are displayed by default.
- No align prompt is displayed on the SEC IRS INIT page.
- No modification of the airport reference coordinates can be performed on the SEC IRS INIT page.

Secondary step altitude pages

— These pages operate as the active STEP ALTS page.

Secondary wind pages :

— Do not have a history wind page.

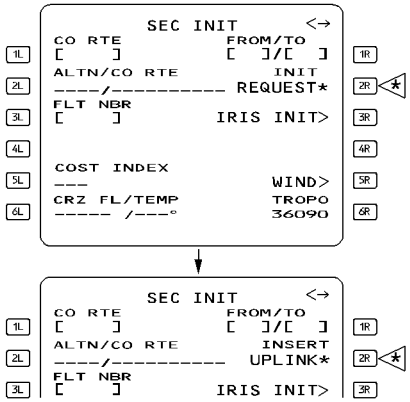
Secondary performance pages :

— All boxes are replaced by blue brackets.
— Have neither an engine-out mode, nor an engine-out long-range cruise cost index.
— Have no expedite predictions.
— Have no ACTIVATE/CONFIRM APPROACH PHASE prompt.
— Have no PRED TO ALTN predictions on the PERF CLB and PERF DES pages.
R — Have no top of descent, no cabin descent rate information on the PERF CRZ page.

The secondary flight plan does not have a FUEL PRED page.

The secondary INIT A page is also used to request or display an uplink INIT message received after engine start.

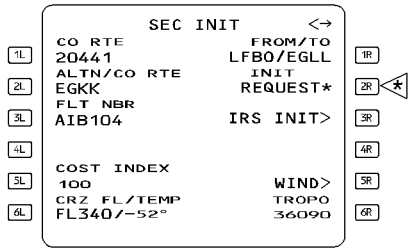
This uplink INIT message can be cleared or inserted as SEC INIT data.



NFC5-04-0328-108-A130AA

[2R] INIT REQUEST* This field enables init data to be requested from the ground.

[2R] INSERT UPLINK * An uplink message has been received following a request.
The message can be cleared or entered on the SEC INIT page.



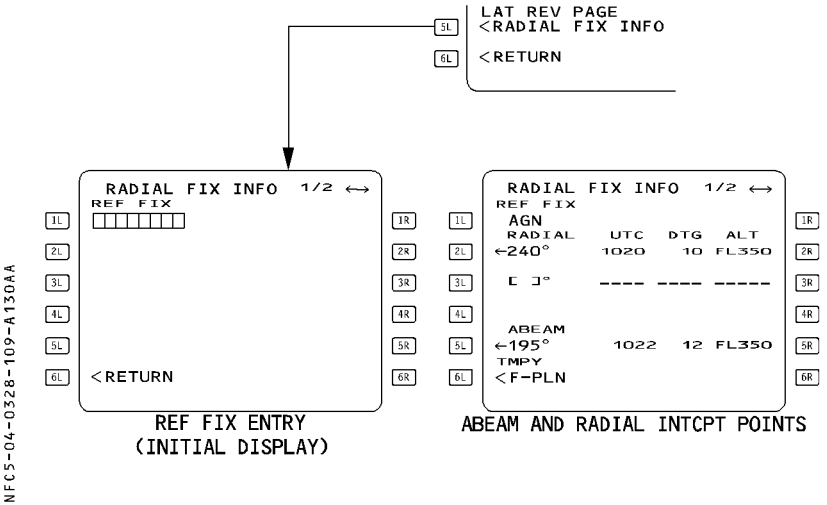
NFC5-04-0328-108-B130AA

SECONDARY INIT A PAGE
AFTER UPLINK MESSAGE
INSERTION.

RADIAL FIX INFO PAGES

The RADIAL FIX INFO pages provides access to the RADIAL intercept function.
The reference may be one or more radial bearings, based on a given database fix or a pilot-defined element.
If the radial intercepts the active flight plan, the intersection point can be converted to a waypoint and inserted into the flight plan.
In addition, the ABEAM function may be used.
The RADIAL FIX INFO pages may be accessed from the LAT REV page, after performing a lateral revision :

- At the origin airport,
- At the FROM waypoint,
- At the destination airport.



[1L] REF FIX (blue)	Enables entry of the REF FIX. This reference may be any database element (navaid, waypoint, NDB, airport, runway) or a pilot-defined element. Before entry, amber boxes are displayed.
[2L] – [2R] RADIAL (blue) to [4L] – [4R]	Enables entry of a radial from the REF FIX. If the radial line intersects the active flight plan, the FMGS will compute the time, the along path DTG (Distance To Go), and the altitude at the intersection point (small green font). A large blue star is then displayed to insert the intersection waypoint into the flight plan. This waypoint is not part of the pilot-stored elements. It is automatically labelled : "XXXNNN" XXX = First 3 letters of the REF FIX ident. NNN = Value of the radial

[5L] - [5R] ABEAM

This function enables the pilot to create a waypoint in the flight plan (primary or secondary) that is abeam the reference fix (REF FIX).
Once computed, the page displays the radial number in large green font. The FMGS computes the time, distance to go, and altitude at the abeam point (small green font).
Selecting the key next to the star creates the waypoint and inserts it into the temporary flight plan.
The waypoint is labelled : "AB" + the REF FIX ident, for example, with "TOU" VOR, "ABTOU".

[6L] TMPY F-PLN or RETURN

This field displays "TMPY F-PLN" in yellow font, if a temporary flight plan exists. It enables to return to the temporary flight plan page. Otherwise, the RETURN prompt is displayed and enables to return to the LAT REV page.

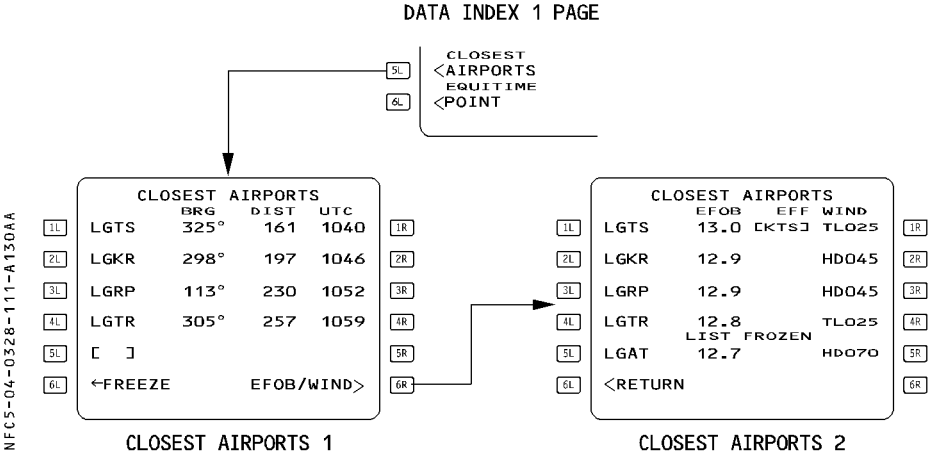
Note : A second RADIAL FIX INFO page is available by using the scroll keys. This provides the capability to compute radial intercepts and an abeam point from a second, different REF FIX.

CLOSEST AIRPORTS PAGES

The FMS automatically selects the four closest airports from the current aircraft position, and displays them on the CLOSEST AIRPORT pages, ranked by distance. The flight crew can select an additional, fifth airport on this page.

- CLOSEST AIRPORTS page 1 displays the bearing, distance, and time to go to each airport
- CLOSEST AIRPORTS page 2 displays the Estimated Fuel On Board (EFOB) and enables the crew to check or modify the effective wind estimated to the corresponding airport.

The flight crew accesses the CLOSEST AIRPORTS page 1 by pressing the [5L] key on the DATA INDEX 1 page. They access the CLOSEST AIRPORTS page 2 by pressing the EFOB/WIND prompt (6R key) on page 1.



CLOSEST AIRPORTS 1 page

[1L] - [1R] BRG/DIST/UTC (green) to [4L] - [4R]	The closest four airports are extracted from the database, and ranked by distance from the aircraft position.	
	BRG	Displays the current bearing from the aircraft's position to the airport.
	DIST	Displays the current great-circle distance from the aircraft's position to the airport.
	UTC	Displays the predicted time of arrival at the airport, computed using the current wind or a wind vector entered on page 2, and the speed in accordance with the current mode (managed or selected). The time is only computed in cruise phase.
[5L]	The crew may enter a fifth airport in this field, using the 4–letter ICAO code. The field may be modified at any time, even when "LIST FROZEN" is displayed.	

If the crew enters an airport that is not in the database, a "NOT IN DATABASE" message appears in the scratchpad.

[6L] FREEZE/UNFREEZE (cyan)
This prompt enables the pilot to freeze and unfreeze the list of four airports.
The list is automatically frozen when accessing page 2. It will remain frozen until returning to page 1.
The "LIST FROZEN" message is always displayed on page 2.

[6R] EFOB/WIND
Gives access to page 2.
Pressing this prompt automatically freezes the list of the four closest airports.

CLOSEST AIRPORTS 2 page :

[1L] - [1R] EFOB (green)
to
[5L] - [5R] EFF WIND (cyan)
Displays the EFOB at each airport. The EFOB is only computed in cruise phase.
Used to enter an estimated effective wind (headwind or tailwind) along the route to the airport. If the entry is preceded by "+", "T", or "TL", a tailwind is assumed.
If the entry is preceded by "–", "H", or "HD", a headwind is assumed.
This field displays in small font a default value, based on the current wind experienced by the aircraft. The crew can modify this value, it is then displayed in large font.
The effective wind is used to compute the EFOB and time to reach the airport.

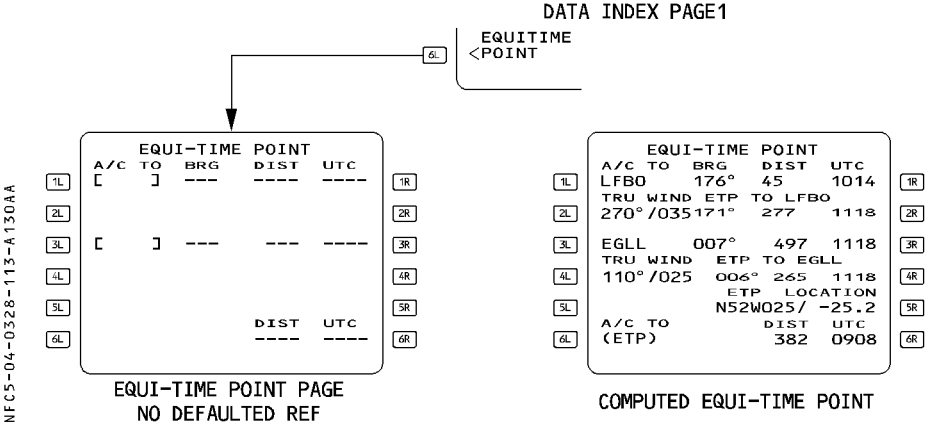
[6L] RETURN
Returns to page 1.

Note : – *If the aircraft position becomes invalid, all BRG, DIST, UTC fields are dashed. The CLOSEST AIRPORTS page still displays the last available list of 4 closest airports and the last crew-defined airport (if any). FREEZE/UNFREEZE and EFOB/WIND prompts are removed, LIST FROZEN is displayed, and the A/C POSITION INVALID message is displayed in the scratchpad. Page 2 cannot be accessed.*

– *Predictions (EFOB, TIME) displayed on the CLOSEST AIRPORTS page assume :*
- *ECON CRZ speed (managed) or current selected speed (selected) is kept ;*
- *CI (for managed speed only) and CRZ FL from the active F-PLN are kept*
- *A constant wind value ;*
- *In case of engine out, the aircraft altitude is the minimum of (CRZ FL, EO MAX ALT) ;*
- *Downpath steps are not considered ;*
- *Descent fuel burn is a conservative value which only depends on the difference between current CRZ ALT and the destination airport altitude.*

EQUI-TIME POINT PAGE

The flight crew uses this page to request an equi-time point computation between two different points (airport, navaid, runway, NDB or waypoint). This pseudo-waypoint (ETP) is displayed on the navigation display along the F-PLN. The EQUI-TIME POINT page is accessed by pressing the 6L key on the DATA INDEX 1 page :



[1L] A/C TO and [3L] (blue) — Displays reference waypoint 1. and Displays reference waypoint 2.

Note : Origin and destination airports are used by default for respective reference points 1 and 2, until a pilot entry is made.

[1R] BRG/DIST/UTC — Displays the bearing, distance, time, from the aircraft's current position to the reference waypoint 1.

and [3R] (green) — Displays the bearing, distance, time, from the current position of the aircraft to the reference waypoint 2.

- BRG : Displays the current great-circle bearing from the position of the aircraft to the reference waypoint.
- DIST : Displays the current great-circle distance from the position of the aircraft to the reference waypoint.
- UTC : Displays the predicted time of arrival at the reference waypoint (computed using the current wind or a wind vector, entered by the crew).
  The time is only computed in cruise phase. In other phases, it is dashed.

[2L] and [4L] TRU WIND (blue)	The crew may enter the wind (direction/velocity) estimated at the reference waypoint at the CRZ FL altitude. This wind value is used to calculate the time from the position of the aircraft to the reference waypoint, and to locate the equitime point. If no entry is made, the wind/velocity field reads zero.
[2R] and [4R] ETP TO XXXX (green)	Displays the bearing distance and the time from the Equi-Time Point (ETP) position to the reference waypoint.
[5R] ETP LOCATION	Displays the ident of the F-PLN waypoint following the equitime point. It provides the distance along the flight plan from the ETP to the indicated waypoint.
[6L] - [6R] A/C TO (ETP) DIST/UTC (green)	This field displays the distance from the current position of the aircraft to the ETP along the flight plan, and the estimated time of arrival at the ETP. If at least one reference waypoint exists, but no ETP exists, the field is blank and NO ETP is displayed in 6L.

Note : The ETP computation is based on the cost index, managed speed (with SPD LIM), and predicted winds.
In case of engine-out, the EO LRC speed is assumed.

BRIGITTE RTA PAGE

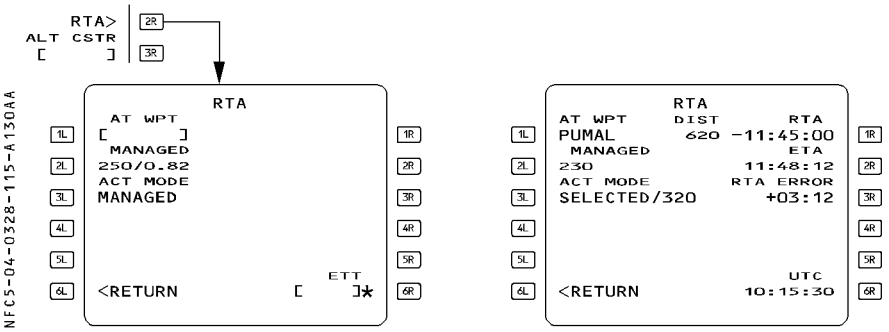
The RTA (Required Time of Arrival) page enables to enter a time constraint on a given waypoint. When an RTA has been defined at a waypoint, the RTA page provides the following information :

- Predicted ETA at the time-constrained waypoint
- Performance adjusted SPD target
- Time error
- Distance to time constrained waypoint
- Active speed mode.

The RTA page also allows to enter an Estimated Takeoff Time (ETT), or may display an FMS-computed ETT.

The flight crew calls up this page with the RTA prompt from the VERT REV page.

VERT REV PAGE



[1L] – [1R] AT WPT/DIST/RTA	This line displays AT WPT and empty blue brackets, when no waypoint has been specified, or AT WPT, DIST and RTA when a waypoint has been defined. The waypoint identifier is displayed in large blue font. If only the waypoint identifier has been defined and no RTA value, blue brackets and a blue star are displayed facing the 1R prompt. The flight crew enters the time constraint as “HHMMSS”, preceeded by : A “–” sign for “at or before” A “+” sign for “at or after” no sign for “at”.
[2L] MANAGED (green)	This field displays the FMGS-computed ECON speed/Mach (ref. FCOM 4.02.20)

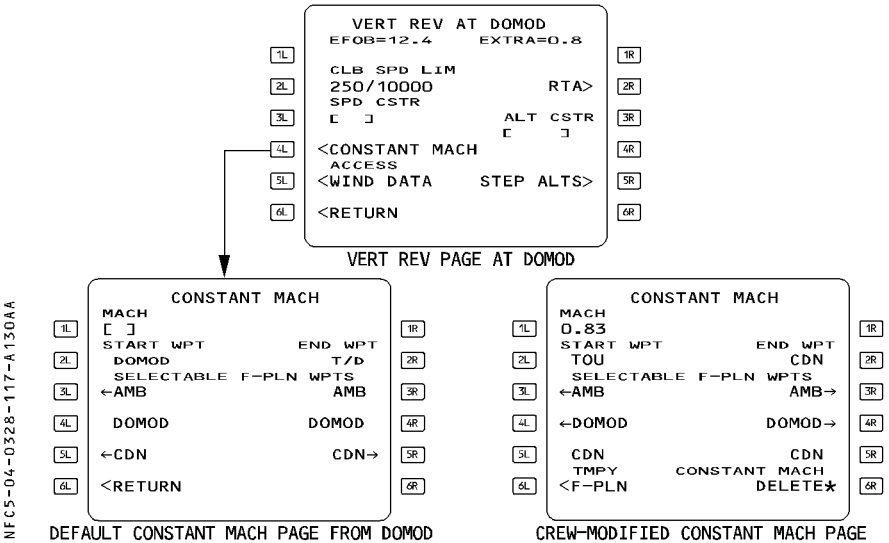
[3L] ACT MODE (green)	Displays the active speed mode : MANAGED or SELECTED/NNN (NNN is the selected target speed). The crew cannot modify the active speed mode via this field.
[6L] TMPY F-PLN (yellow) or RETURN (white)	The crew presses this key to revert the display to the VERT REV page. The TMPY F-PLN prompt accesses the temporary F-PLN page.
[2R] ETA (green)	When a required time at arrival has been defined, the 2R field displays the estimated time of arrival as “HHMMSS”.
[3R] RTA ERROR	This field is blank when the RTA is predicted as made. If the RTA is predicted as missed, “RTA ERROR” is displayed in small white font, and the calculated time error between the ETA and the RTA is displayed in small amber font.
[6R] ETT	The Estimated Takeoff Time (ETT) field is available in preflight phase. If no ETT has been entered, the 6R field displays blue brackets and a blue star. When an ETT has been entered, it is displayed in magenta. This field may also display an FMS-computed ETT, when an RTA has been defined.
UTC	Universal time is displayed in green for takeoff, climb, cruise, descent and approach phases.

CONSTANT MACH PAGE

The CONSTANT MACH page allows the crew to specify a constant Mach value to be kept during a given part of the cruise phase. The crew can specify on this page :
– The desired constant Mach value
– The Start and End waypoint of the constant Mach segment.
The constant Mach segment is flown in MANAGED speed mode. The FMS takes the crew-entered constant Mach into account to calculate the cruise predictions.

Note : A constant Mach may also be defined in the SEC F-PLN.

The CONSTANT MACH page is accessed by pressing the CONSTANT MACH prompt [4L] on the VERT REV page from any waypoint, including the FROM waypoint.
The CONSTANT MACH page is accessible in pre-flight, takeoff, climb and cruise phases. A constant Mach may only be defined between two cruise waypoints.



[1L] MACH (blue)
Enables the entry of the desired Mach value

[2L] START WPT (blue)
Enables the Start waypoint of the constant Mach segment to be specified. The default Start waypoint is the waypoint at which the vertical revision has been performed, if it belongs to the cruise phase. Otherwise, the field is blank. The default Start waypoint (if any) is displayed in small blue font. The crew may select a different Start waypoint in the list of selectable F-PLN waypoints. A crew-selected Start waypoint is displayed in large blue font.

SELECTABLE F-PLN WPTS (blue) [3L] – [3R] [4L] – [4R] [5L] – [5R]	This is the list of the F-PLN waypoints that can be selected as Start or End waypoint of the constant Mach segment. The FMS automatically displays the list of all downpath waypoints belonging to the cruise phase (before the T/D). The crew selects the Start waypoint in the list on the left side, and the End waypoint on the right side.
[6L] <RETURN (white) or <TMPY F-PLN (yellow)	If a temporary F-PLN exists, the prompt <TMPY F-PLN is displayed. This enables the crew to return to the TMPY F-PLN page. If no TMPY F-PLN exists, the <RETURN prompt is displayed. It enables a return to the VERT REV page.
[2R] END WPT (blue)	This field enables the End waypoint of the constant Mach segment to be specified. By default, the End waypoint is the Top of Descent (T/D). The default End waypoint is in small blue font. The crew may select a different End waypoint in the list of selectable F-PLN waypoints. A crew-selected End waypoint is displayed in large blue font.
[6R] CONSTANT MACH DELETE* (white)	This prompt enables the deletion of the constant Mach. It is displayed only when a constant Mach has been previously-defined.

MCDU MESSAGE LIST

Messages displayed on the MCDU are of two types and displayed in two colors.
Type I : a direct result of a pilot action
Type II : information about a situation or a call for pilot action
Type II messages are stored in a first-in/first-out message queue (5 messages max.)
They are suppressed if correct data is entered or when they no longer apply.
The flight crew can clear all messages by pressing the CLEAR key on the MCDU console.
Amber : important
White : less important

MESSAGE	TYPE/COLOR	CONDITIONS
A/C POSITION INVALID	II/A	The aircraft position has become invalid. If the message has been cleared and the flight crew attempts to call up the HOLD at PPOS or DIR TO page while the aircraft position is still invalid, then the message is displayed again.
ACT RTE UPLNK ◁ (ACARS msg)	II/W	A flight plan is stored in the active flight plan.
ALIGN IRS	II/A	Appears when the IRS are ready for alignment, but the INIT A page is not displayed on either side of the flight deck. The ALIGN IRS message requires that one of the flight crew call up the INIT A page and take whatever action it calls for.
ALT F-PLN DELETED	II/W	The Alternate Flight Plan has been deleted automatically. This occurs when the flight plan memory is full and the system attempts to store more data in it.
AWY/WPT MISMATCH	I/W	The pilot has attempted to enter a VIA or a GO TO on the LAT REV page, and the new point is not on the entered airway.
CABIN RATE EXCEEDED	II/W	This message appears when the aircraft gets within 200 NM of the destination and the computed rate of descent makes it impossible for the cabin to be repressurized at the maximum rate.
CHECK A/C POSITION	II/A	The radio position is more than 12 NM from the IRS position while the DME/DME/Inertial or VOR/DME/inertial position mode remains valid.
CHECK ALTN WIND ◁ (ACARS msg)	II/W	The uplinked alternate cruise differs from the default alternate cruise flight level.

R

MESSAGE	TYPE/COLOR	CONDITIONS
CHECK APPR GUIDANCE "CHECK APP SEL" is displayed on EFIS PFD (W)	II/W	Displayed, when a non-LS approach is part of the flight plan and the flight crew has manually tuned an ILS on the RAD NAV page. This is to remind the crew that the available guidance modes for the approach are APP NAV and FINAL. Displayed : – In cruise, when less than 100 NM from the Top of Descent ; – At initiation of the descent phase ; – In the descent and approach phases.
CHECK CO RTE ◁ (ACARS msg)	II/W	The uplinked company route identifier differs from the one specified in the request.
CHECK DATA BASE CYCLE	II/W	The current date does not match the effective date of the active database, and someone attempts to enter a FROM/TO or CO RTE.
CHECK DEST DATA ◁ (ACARS msg)	II/A	The aircraft is at 180 NM from destination, and the destination QNH, TEMP or WIND (displayed on the PERF APPR page received by ACARS uplink) has to be checked. If a modification of these parameters is performed, creating a conflict with previous data, the message is triggered again.
CHECK FLT NUMBER ◁ (ACARS msg)	II/A	The uplinked flight number differs from the flight number specified in the request.
CHECK GW	II/A	The gross weights computed by the Flight Management Computer and the Flight Augmentation Computer disagree by more than 7 tonnes (7.7 U.S tons).
CHECK QFE	II/A	This appears, at the transition from QNH to QFE reference, when the QFE altitude differs by more than 100 feet from the altitude predicted with the QNH set on the MCDU by means of the airport elevation in the NAV database.
CLK IS TAKEOFF TIME	II/W	This appears when the flight crew has entered an Estimated Takeoff Time (ETT) and actual time is equal to ETT.
CROSS LOAD COMPLETE ◁	II/W	The database crossload from one FMGC to the other was successfully completed.
CROSSLOAD ABORTED ◁	II/W	Message displayed on the transmitting MCDU, indicating an error in the transmission process.

MESSAGE	TYPE/COLOR	CONDITIONS
CRZ FL ABOVE MAX FL	II/W	This appears when the flight crew enters a cruise altitude that is above the computed maximum altitude.
CSTR DEL ABOVE CRZ FL	II/W	This appears when a flight plan altitude constraint has been deleted because the flight crew has inserted a cruise flight level or step-down altitude that is at or below the flight plan constraint.
CSTR DEL UP TO WPT01	II/W	This appears when constraints get deleted because the aircraft transitions to a go-around flight phase before the FMGS sequences the flight plan destination.
DECELERATE Also displayed on PFD	II/A	The aircraft is still in cruise phase and managed speed after it reaches the top of descent, and it has not begun the descent.
DEFAULT STATE ASSUMED	II/W	This appears when all initialization data has been cleared after a very-long-term (VLT) power interruption. The flight crew should see this only when powering up a new MCDU.
DELETING OFFSET	II/W	This appears when the system is deleting an offset automatically, which it does under certain specific conditions, such as : – change of active leg due to lateral revision. – termination of next leg at destination runway (must join trajectory for final approach)
DES/ALTN MISMATCH	I/W	The flight crew attempts to enter an alternate CO RTE (which starts at an origin that is not the primary flight plan destination).
DIR TO IN PROCESS	I/W	The flight crew calls up the vertical or lateral revision page on one MCDU while the direct to page is displayed on the other MCDU.
DISCONT AHEAD	II/A	The aircraft is in NAV mode and is 30 seconds away from a lateral discontinuity, or the flight crew makes a modification less than 30 seconds before the aircraft is to reach a lateral discontinuity.
ENTER DEST DATA	II/A	The flight crew has not entered wind, QNH, or temperature for the destination, and the aircraft is 180 NM out.
ENTRY OUT OF RANGE	I/W	The flight crew attempts to enter data that is out of the range specified for the selected field.

R

MESSAGE	TYPE/COLOR	CONDITIONS
FLT NBR UPLINK ◁ (ACARS msg)	II/W	A flight number has been added to the uplink flight plan without previous request.
F-PLN ELEMENT RETAINED	I/W	The pilot attempts to delete stored navaids, waypoints or runways that are contained in any flight plan or that are being tuned.
F-PLN FULL	II/W	There is not enough memory in the flight plan allotment for the computer to accept more flight plan data.
FMS1/FMS2 A/C STS DIFF	II/W	This message always precedes a transition to independent mode, and appears at power-up if the system detects a difference in one of the following : – NAV Data Base Serial Number – Performance Data Base – FM Operational Program – Aircraft and Airline Program Pins
FMS1/FMS2 GW DIFF	II/W	Onside and offside aircraft weight differ by 2 tons or more.
FMS1/FMS2 POS DIFF	II/A	Onside and offside positions differ by 5 NM (0.5 NM if GPS installed) or more.
FMS1/FMS2 SPD TGT DIFF	II/W	Onside and offside target speeds differ by 5 knots or more.
FORMAT ERROR	I/W	A data entry does not meet the specified entry format for a given field.
GPS PRIMARY LOST ◁ (also displayed on ND)	II/A	Displayed when GPS PRIMARY mode is lost.
GPS PRIMARY ◁	II/W	Displayed when the FMS is transitioning to GPS PRIMARY.
GPS IS DESELECTED ◁	II/A	This message appears when GPS has been manually deselected and the aircraft is 80 NM before the top of descent or in approach phase.
INDEPENDENT OPERATION	II/A	The FMGCs are operating independently of each other.
INITIALIZE WEIGHTS	II/A	The zero-fuel weight or block fuel (FOB) is undefined after engine start.
INVALID FLT NBR ◁ UPLINK (ACARS msg)	II/W	The uplink message contains a valid flight plan but no flight number.
INVALID PERF ◁ UPLINK (ACARS msg)	II/W	Performance uplink message has been rejected.
INVALID RTE ◁ UPLINK (ACARS msg)	II/W	An error was detected in the uplink message and it is rejected.

MESSAGE	TYPE/COLOR	CONDITIONS
INVALID TAKEOFF ◁ UPLINK (ACARS msg)	II/W	The current uplink takeoff data message is rejected.
INVALID WIND◁ UPLINK (ACARS msg)	II/W	The current uplink wind message is rejected.
IRS ONLY NAVIGATION	II/A	The aircraft is not in an approach or terminal area and : – the aircraft has been in IRS mode for more than 10 minutes, or – the aircraft is in IRS only and starts the descent phase.
LAT DISCONT AHEAD	II/A	The next leg is a discontinuity and the aircraft is 30 seconds from flying the leg.
LIST OF 10 IN USE	I/W	The flight crew has tried to enter more than ten stored runways into the data base, and all of the first ten are included in a flight plan or a pilot-stored route.
LIST OF 20 IN USE	I/W	The flight crew has tried to create a PBD, LAT/LONG, or PB-PB, or store a pilot-defined waypoint or navaid when 20 are already in use (in a flight plan or pilot-stored routes).
NAV ACCUR DOWNGRAD (also displayed on ND)	II/A	NAV accuracy has been downgraded from HIGH to LOW. (See FMGS principles for an explanation).
NAV ACCUR UPGRAD (*EFIS ND)	II/A	NAV accuracy has been upgraded from LOW to HIGH.
NEW ACC ALT-HHHH	II/W	The acceleration altitude has been changed.
NEW CRZ ALT-HHHHH	II/W	The cruise altitude has been changed.
NEW THR RED ALT-HHHH	II/W	The thrust reduction altitude has been changed.
NO ANSWER TO ◁ REQUEST (ACARS msg)	I/W	A crew request, was previously sent to the ground and no answer has been received for 4 minutes.
NON UNIQUE ROUTE IDENT	I/W	The flight crew has tried to enter on the new route page a company route ident that is identical to an existing company route ident (pilot-defined or in the data base).
NOT ALLOWED	I/W	Data entry is not allowed in the selected field, or a selection action (LSK push or mode push) is not allowed.
NOT ALLOWED IN NAV	I/W	An attempt to modify the TO waypoint is made while in NAV mode.

MESSAGE	TYPE/COLOR	CONDITIONS
NOT IN DATA BASE	I/W	The pilot is trying to enter or call up a company route ident, a FROM /TO pair, a place defined by place-bearing-distance (PBD) or place-bearing/place-bearing (PBX), or an airport navaid, waypoint runway, or navaid frequency (including pilot-defined elements) that is not in the current data base.
NOT XMITTED ◁ TO ACARS (ACARS msg)	II/W	A pilot request or a pilot report was sent but the communication was not established or not acknowledged.
ONLY SPD ENTRY ALLOWED	I/W	The pilot is trying to enter a Mach number for a preselected speed value on the CLIMB page.
OPP FMGC IN PROCESS	II/W	The offside FMGC is unhealthy, and the FM system mode is SINGLE. The message indicates that the MCDU on which the message is displayed is being driven by the FMGC on the other side.
PAGE UPDATE IN PROCESS	I/W	The pilot presses a key on the flight plan page while predictions are being updated.
PERF DATA ◁ UPLINK (ACARS msg)	II/W	Performance data are received from ground.
PLEASE WAIT	I/W	Resynchronization between both FMGCs is in progress.
PRESS MCDU MENU KEY	II/W	The SUBSYSTEM (TIMEOUT) page is displayed and the system which was selected does not respond.
PRINTER NOT ◁ AVAILABLE	II/W	A printer communication error has been detected while printing a report. The printing is terminated.
RESET IRS TO NAV	II/A	The system has an initial position for IRS alignment, or the initial position has changed since IRS alignment, but none of the IRSs are in align mode.
REVISIONS NOT STORED	II/W	This message, displayed when a pilot-defined route or company route (active or secondary flight plan) is stored, indicates that the following elements are not retained : – Pilot-entered holds – Offsets – Modifications to terminal area procedures – Pilot-entered constraints – Pseudo waypoints

MESSAGE	TYPE/COLOR	CONDITIONS
RTE DATALINK IN ◁ PROG (ACARS msg)	I/W	A flight plan modification is performed after a F-PLN INIT request has been sent. This message is displayed until the uplink is entirely received.
RWY/ILS MISMATCH	II/A	– During climb, cruise, descent, approach, or go-around, the ILS frequency entered on the RAD NAV page does not match the ILS associated with the destination runway. – During preflight or takeoff, the ILS frequency entered on the RAD NAV page does not match the ILS associated with the takeoff runway.
SEC F-PLN DELETED	II/W	The secondary flight plan has been deleted automatically because the memory entries exceeded the capacity of the computer memory used for flight plans.
SEC RTE UPLINK ◁ (ACARS msg)	II/W	A flight plan is stored in the secondary flight plan.
SELECT DESIRED SYSTEM	II/W	The MCDU displays its MENU page.
SENSOR IS INVALID	II/W	– The pilot has selected FF or FQ, or FF + FQ, or FQ + FF on the FUEL PRED page and the sole sensor or both of the selected sensors are invalid, or – The flight crew has entered fuel on board only, and the FF sensor is invalid.

MESSAGES	TYPE/COLOR	CONDITIONS
SET SPEED AUTO ("SET MANAGED SPD" is displayed on PFD)	II/A (W)	The target speed is selected for the current phase, but there is no preselected speed for the next flight phase. When this is so, this message is displayed at transitions from climb to cruise, and from climb or cruise to descent. The message is always displayed at the transition to descent from climb or cruise if selected speed is active. It is not displayed if managed speed is active.
SET HOLD SPEED (also displayed on PFD)	II/A (W)	This instruction appears when the aircraft is in selected speed, the pilot has inserted a hold in the flight plan, the aircraft is 30 seconds or less from the point where it must start decelerating toward hold speed, and the selected speed differs from the hold speed by more than 5 kt.
SET VFTO ("SET GREEN DOT" displayed on PFD)	II/A (W)	This message appears when the following conditions are all met : – Engine-out condition – Climb phase – Aircraft in selected speed mode – FCU-selected speed equal to or greater than green-dot speed + 10 kt,and ALT* or ALT not active, or FCU-selected speed equal to or less than green-dot speed – 10 kt.
SPECIF NDB UNAVAIL	II/A	The NDB to be autotuned (specified for a NDB approach) has been deselected.
SPECIF VOR-D UNAVAIL (also displayed on ND)	II/A	The VOR, VOR-DME, or VORTAC to be autotuned (specified for an RNAV or VOR approach) has been deselected.
SPD ERROR AT WPTXX	II/W	In lateral managed flight, the system predicts that the aircraft will miss a speed constraint by more than 10 kt. When the prediction changes to bring the miss within 5 kt, the message is cleared.
SPD LIM EXCEEDED	II/A	The aircraft is more than 300 feet below the speed limit altitude and more than 10 kt over the speed limit.
STEP ABOVE MAX FL	II/W	The pilot has entered a step altitude that is above the predicted maximum altitude.
STEP DEFINED AT WPTXX	II/W	The system has a step in it, and the step prediction page is called up at a revise point other than that where the step is defined.

MESSAGES	TYPE/COLOR	CONDITIONS
STEP DELETED	II/W	A step has been deleted due to : – an engine out or – the insertion of another step or – a prediction that the step cannot be flown (too near the top of descent).
STORED ROUTE FULL	I/W	The system already contains three pilot-defined routes. (Only three are allowed.)
SYSTEM RNP IS XX.X ◁	II/A	Displayed when the RNP value, manually entered in the PROG page is larger than the RNP value associated with the current flight area (FMGS default value, refer to 4.02.20 position accuracy). It is also displayed when the RNP value associated to the current flight area becomes smaller than the manually entered RNP value.
TAKEOFF DATA ◁ UPLINK (ACARS msg)	II/W	A takeoff data message is received.
TMPY F-PLN EXISTS	I/W	The flight crew has selected any LS key (except ERASE or INSERT) or attempted a flight planning operation on the secondary flight plan while the system is displaying a temporary flight plan.
TIME CSTR DELETED ◁	II/W	A time constraint is deleted automatically, or the flight crew enters a second time constraint, deleting the first one.
TIM CSTR EXISTS ◁	I/W	The crew attempts to clear an ETT (estimated takeoff time) computed by the FMGS.
TIME ERROR AT WPT XX ◁	II/W	While the aircraft is not airborne, or is airborne and in NAV mode, the FMGC predicts that it will miss a time constraint by more than two minutes.
TIME TO EXIT	II/A	The aircraft must leave holding immediately to satisfy fuel reserve requirements. (Extra fuel is zero).
TOO STEEP PATH AHEAD	II/A	The system displays this message in cruise phase if the aircraft is within 150 NM of its destination or in descent or approach phase and in NAV mode and the descent profile contains a segment that is too steep.
TUNE BBB FFF.FF	II/A	The system cannot autotune the VOR for approach or position because of a manual VOR selection.

MESSAGE	TYPE/COLOR	CONDITIONS
UNKNOWN PROGRAM PIN	II/W	The system has been unable to initialize because of an incompatible or undefined aircraft pin program combination (A/C type, engine type, VMO/MMO parity) in the FMGC software.
UPLINK INSERT IN ◁ PROG (ACARS msg)	II/W	Displayed when an uplink message is currently inserted in the FMGS.
USING COST INDEX-NNN	I/W	The system contains a flight plan, and the flight crew tries to enter a zero fuel weight or a gross weight into it before defining a Cost Index (CI). The FMGC defaults to the cost index from the last flight.
VERT DISCON AHEAD (also displayed on PFD)	II/A	The aircraft is in CLB or DES mode, the next leg has a segment that is too steep, and the aircraft is less than 30 seconds from the discontinuity.
WAIT FOR SYSTEM RESPONSE	II/W	The MCDU displays the SUBSYSTEM WAIT page.
WIND DATA UPLINK ◁ (ACARS msg)	II/W	Uplink wind message have been received.
WIND UPLINK EXISTS ◁ (ACARS msg)	I/W	A flight plan modification (active or secondary) is attempted when uplink winds are not inserted yet.
WIND UPLINK PENDING ◁ (ACARS msg)	II/A	A temporary flight plan exists or a DIR TO page is displayed and a wind uplink is received and stored.
XXXX IS DESELECTED	I/W	The flight crew attempts to enter a deselected navaid through the RAD NAV or PROG page.

MCDU MESSAGE LIST

Messages displayed on the MCDU are of two types and displayed in two colors.
Type I : A direct result of a pilot action ;
Type II : Information about a situation, or a call for pilot action ;
Type II messages are stored in a first-in/first-out message queue (5 messages max).
They are suppressed, if correct data is entered or when they no longer apply.
The flight crew can clear all messages by pressing the CLEAR key on the MCDU console.
Amber (A) : Important
White (W) : Less important

MESSAGE	TYPE/COLOR	CONDITIONS
A/C POSITION INVALID	II/A	The aircraft position has become invalid. If the message has been cleared and the flight crew attempts to call up the HOLD at PPOS or DIR TO page while the aircraft position is still invalid, then the message is displayed again.
ACT RTE UPLINK (ACARS msg)	II/W	A flight plan is stored in the active flight plan.
ALIGN IRS	II/A	Appears when the IRS are ready for alignment, but the INIT A page is not displayed on either side of the flight deck. The ALIGN IRS message requires that one of the flight crew call up the INIT A page and take whatever action it calls for.
AREA RNP IS XX-XX	II/A	Displayed when the RNP value, manually-entered on the PROG page, is larger than the default RNP value associated to the current flight area and when there is no RNP value defined in the navigation database for the active leg or route.
AWY/WPT MISMATCH	I/W	The pilot entered VIA on the AIRWAYS page does not contain the revised point. If you enter a second airway ident, it must contain the first airway ending point.
BLOCK IGNORES RTA	II/W	A time constraint existing at initiation of flight planning, or an entry of a time constraint made after initiation of flight planning, are ignored by the fuel planning function.

MESSAGE	TYPE/COLOR	CONDITIONS
CABIN RATE EXCEEDED	II/W	This message appears when the aircraft gets within 200 NM of the destination and the computed rate of descent makes it impossible for the cabin to be repressurized at the maximum rate.
CHECK ALTN WIND (ACARS msg)	II/W	The uplinked alternate cruise flight level differs from the defaulted alternate cruise flight level.
CHECK APPR SELECTION *EFIS PFD (FMA)	II/W	Displayed when a NON ILS approach is part of the F-PLN and an ILS is manually tuned on RAD NAV page. This message reminds the crew that available guidance modes for the approach are APP NAV/FINAL. Displayed when in cruise at less than 100 NM from the top of descent or in descent or approach phase.
CHECK CO RTE (ACARS msg)	II/W	The uplinked company route identifier differs from the one specified in the request.
CHECK DATA BASE CYCLE	II/W	The current date does not match the effective date of the active database, and someone attempts to enter a FROM/TO or CO RTE.
CHECK IRS 1(2)(3)/FM POSITION	II/A	Each IRS position is compared to the FM position. The difference is greater than a threshold function of time.
CHECK DEST DATA (ACARS msg)	II/A	The aircraft is at 180 NM from destination and the destination QNH, TEMP or WIND displayed on the PERF APPR page received by ACARS uplink has to be checked. If a modification of these parameters is performed creating a conflict with previous data, the message is triggered again.
CHECK FLT NBR (ACARS msg)	II/A	The uplinked flight number differs from the flight number specified in the request.
CHECK GW	II/A	The gross weights computed by the flight management computer and the flight augmentation computer disagree by more than 7 tonnes (7.7 U.S tons)
CHECK QFE	II/A	This appears at the transition from QNH to QFE reference, when the QFE altitude differs by more than 100 feet from the predicted altitude, with the QNH set on the MCDU by means of the airport elevation in the NAV database.

R

MESSAGE	TYPE/COLOR	CONDITIONS
CHECK TAKEOFF DATA	II/W	Following a flight crew entry or modification of one of the take-off parameters, there may be an inconsistency between the take-off runway or the TO shift and V1, V2, VR, FLEX TO temperature or derated level. The flight crew activated the secondary F-PLN in PREFLIGHT or DONE phase.
CLK IS TAKEOFF TIME	II/W	This appears when the flight crew has entered an Estimated Takeoff Time (ETT), and the actual time is equal to ETT.
CLOCK/GPS TIME DIFF XX	II/A	Aircraft clock time and GPS time differ by more than XX minutes.
CROSSLOAD ABORTED	II/W	Message displayed on the transmitting MCDU, indicating an error in the transmission process.
CROSSLOAD COMPLETE	II/W	The database crossload from one FMGC to the other was successfully completed.
CRZ FL ABOVE MAX FL	II/W	This appears when the flight crew enters a cruise altitude that is above the computed maximum altitude.
CSTR DEL ABOVE CRZ FL	II/W	This appears when a flight plan altitude constraint has been deleted because the flight crew has inserted a cruise flight level, or step-down altitude that is at or below the flight plan constraint.
CSTR DEL UP TO WPT01	II/W	This appears when constraints get deleted because the aircraft transitions to a go-around flight phase, before the FMGS sequences the flight plan destination.
DECELERATE Also displayed on PFD	II/A	The aircraft is still in the cruise phase and managed speed, after it reaches the Top of Descent and has not begun the descent.

MESSAGE	TYPE/COLOR	CONDITIONS
DELETING OFFSET	II/W	This appears when the system is deleting an offset automatically, which it does under certain specific conditions, such as : – change of active leg due to lateral revision. – termination of next leg at destination runway and the current distance to go is less than or equal to the distance required to reach the path, or the next leg is not a CF, FM or TF leg.
DEST/ALTN MISMATCH	I/W	The pilot attempts to enter an alternate CO RTE (which starts at an origin that is not the primary flight plan destination).
DIR TO IN PROCESS	I/W	The flight crew calls up the vertical or lateral revision page on one MCDU while the direct to page is displayed on the other MCDU.
ENTER DEST DATA	II/A	The flight crew has not entered wind, QNH, or temperature for the destination, and the aircraft is 180 NM out.
ENTRY OUT OF RANGE	I/W	The flight crew attempts to enter data that is out of the range specified for the selected field.
FLT NBR UPLINK (ACARS msg)	II/W	A flight number has been added to the uplink flight plan without previous request.
F-PLN ELEMENT RETAINED	I/W	The flight crew attempts to delete stored navaids, waypoints or runways that are contained in any flight plan or that are being tuned.
F-PLN FULL	II/W	There is not enough memory in the flight plan allotment for the computer to accept more flight plan data.
FMS1/FMS2 A/C STS DIFF	II/W	This message always precedes a transition to independent mode, and appears at power-up if the system detects a difference in one of the following : – NAV database serial number – Performance database – FM operational program – Aircraft and airline program pins

MESSAGE	TYPE/COLOR	CONDITIONS
FMS1/FMS2 GW DIFF	II/W	Onside and offside aircraft weight differ by 2 tons or more.
FMS1/FMS2 PGM PIN DIFF	II/W	Onside and offside program pins are different.
FMS1/FMS2 POS DIFF	II/A	Onside and offside positions differ by 0.5NM or more.
FMS1/FMS2 SPD TGT DIFF	II/W	Onside and offside target speeds differ by 5 knots or more.
FORMAT ERROR	I/W	A data entry does not meet the specified entry format for a given field.
GPS PRIMARY LOST (also displayed on ND)	II/A	Displayed when GPS PRIMARY mode is lost.
GPS PRIMARY	II/W	Displayed when the FMS is transitioning to GPS PRIMARY
GPS IS DESELECTED	II/A	This message appears when GPS has been manually deselected and the aircraft is 80 NM before the top of descent or in approach phase.
INDEPENDENT OPERATION	II/A	The FMGCs operate independently of each other.
INITIALIZE WEIGHTS	II/A	The zero-fuel weight or block fuel (FOB) is undefined after engine start.
INVALID FLT NBR UPLINK (ACARS msg)	II/W	The uplink message contains a valid flight plan but no flight number.
INVALID PERF UPLINK (ACARS msg)	II/W	Performance uplink message has been rejected.
INVALID RTE UPLINK (ACARS msg)	II/W	An error was detected into the uplink message and it is rejected.
INVALID TAKEOFF UPLINK (ACARS msg)	II/W	The current uplink takeoff data message is rejected.
INVALID WIND UPLINK (ACARS msg)	II/W	The current uplink wind message is rejected.
LAT DISCONT AHEAD	II/A	The next leg is a discontinuity and the aircraft is 30 seconds from flying the leg.

MESSAGE	TYPE/COLOR	CONDITIONS
LIST OF 10 IN USE	I/W	The flight crew has tried to enter more than ten stored runways into the database, and all of the first ten are included in a flight plan or a pilot-stored route.
LIST OF 20 IN USE	I/W	The flight crew has tried to create a PBD, LAT/LONG, or PB-PB, or store a pilot-defined waypoint or navaid when 20 are already in use (in a flight plan or pilot-stored routes).
MACH SEGMENT DELETED	II/W	A constant Mach segment of the active flight plan has been automatically deleted. This occurs when the secondary flight plan or the alternate is activated, or engine out is detected or when the flight phase changes from CRZ to another one.
MCDU OVERHEATED	II/A	This message is displayed for 15 seconds in case of MCDU overheating.
MORE DRAG (EFIS PFD)	II/W	DES mode is engaged, idle is selected and the aircraft must decelerate in order to recover the path, or to respect an altitude constraint, a speed limit or a speed constraint.
NAV ACCUR DOWNGRAD (also displayed on ND)	II/A	NAV accuracy has been downgraded from HIGH to LOW. (See FMGS principles for an explanation).
NAV ACCUR UPGRAD (*EFIS ND)	II/A	NAV accuracy has been upgraded from LOW to HIGH.
NEW ACC ALT-HHHH	II/W	The acceleration altitude has been changed.
NEW CRZ ALT-HHHHH	II/W	The cruise altitude has been changed.
NEW THR RED ALT-HHHH	II/W	The thrust reduction altitude has been changed.
NO ANSWER TO REQUEST (ACARS msg)	I/W	A crew request, was previously sent to the ground and no answer has been received for 4 minutes.
NO INTERSECTION FOUND	I/W	The system could not find any common waypoint nor intersection point through the airway.
NON UNIQUE ROUTE IDENT	I/W	The flight crew has tried to enter on the new route page a company route ident that is identical to an existing company route ident (pilot-defined or in the database).
NOT ALLOWED	I/W	Data entry is not allowed in the selected field, or a selection action is not allowed.
NOT ALLOWED IN NAV	I/W	An attempt to modify the TO waypoint is made while in NAV mode.

MESSAGE	TYPE/COLOR	CONDITIONS
NOT IN DATA BASE	I/W	The pilot is trying to enter or call up a company route ident, a FROM/TO pair, a place defined by place-bearing-distance (PBD) or place-bearing/place-bearing (PB/PB) or an airport navaid, waypoint runway, or navaid frequency (including pilot-defined elements) that is not in the current database.
NOT XMITTED TO ACARS (ACARS msg)	II/W	A pilot request or a crew report was sent but the communication was not established or not acknowledged.
ONLY SPD ENTRY ALLOWED	I/W	The pilot is trying to enter a Mach number for a preselected speed value on the CLIMB page.
OPP FMGC IN PROCESS	II/W	The offside FMGC is unhealthy, and the FM system mode is SINGLE. The message indicates that the MCDU on which the message is displayed is being driven by the FMGC on the other side.
PAGE UPDATE IN PROCESS	I/W	The pilot presses a key on the flight plan page while predictions are being updated.
PERF DATA UPLINK (ACARS msg)	II/W	Performance data are received from ground.
PLEASE WAIT	I/W	Resynchronization between both FMGCs is in progress.
PROCEDURE RNP IS XX.XX	II/A	Displayed when the RNP value, manually-entered on the PROG page, is larger than the RNP value defined in the navigation database for the active leg or route.
PRINTER NOT AVAILABLE (ACARS msg)	II/W	A printer communication error has been detected while printing a report. The printing is terminated.
RESET IRS TO NAV	II/A	The system has an initial position for IRS alignment, or the initial position has changed since IRS alignment, but none of the IRSs are in align mode.

MESSAGE	TYPE/COLOR	CONDITIONS
REVISIONS NOT STORED	II/W	This message, displayed when a pilot-defined route or company route (active or secondary flight plan) is stored, indicates that the following elements are not retained : – Pilot-entered holds – Offsets – Modifications to terminal area procedures – Pilot-entered constraints – Pseudo waypoints – Step at optimum.
RTA DELETED	II/W	A time constraint is automatically deleted : – in case of engine-out – when entering the holding pattern – in case of go-around – at phase transition to approach – at phase transition from approach to climb – when a time constraint is inserted in the same flight plan at a different waypoint – When a DIR TO/ABEAM is performed – When the alternate flight plan is activated
RTA EXISTS	I/W	Displayed if the pilot tries to clear an estimated takeoff time defined by the system.
RTE DATALINK IN PROG (ACARS msg)	I/W	A flight plan modification is performed after a F-PLN INIT request has been sent. This message is displayed until the uplink is entirely received.
RWY/LS MISMATCH	II/A	– During climb, cruise, (ILS or MLS) descent approach, or go-around, the LS frequency entered on the RAD NAV page does not match the LS associated with the destination runway. – During preflight or takeoff, the LS frequency entered on the RAD NAV page does not match the LS associated with the takeoff runway.
SEC RTE UPLINK (ACARS msg)	II/W	A flight plan is stored in the secondary flight plan.
SELECT DESIRED SYSTEM	II/W	The MCDU displays its MENU page.

MESSAGE	TYPE/COLOR	CONDITIONS
SENSOR IS INVALID	II/W	– The pilot has selected FF or FQ, or FF + FQ, or FQ + FF on the FUEL PRED page and the sole sensor or both of the selected sensors are invalid, or – The flight crew has entered fuel on board only, and the FF sensor is invalid.
SET GREEN DOT SPEED ("SET GREEN DOT" displayed on PFD)	II/A (W)	This message appears when the following conditions are all met : – Engine-out condition – Aircraft in selected speed mode – FCU-selected speed equal to or greater than green-dot speed + 10 kt, and ALT* or ALT not active, or FCU-selected speed equal to or less than green-dot speed – 10 kt.
SET HOLD SPEED (also displayed on PFD)	II/A (W)	This instruction appears when the aircraft is in selected speed, the pilot has inserted a hold in the flight plan, the aircraft is 30 seconds or less from the point where it must start decelerating towards hold speed, and the selected speed differs from the hold speed by more than 5 kt.
SET MANAGED SPEED ("SET MANAGED SPD" is displayed on PFD)	II/A (W)	The target speed is selected for the current phase, but there is no preselected speed for the next flight phase. When this is so, this message is displayed at transitions from climb to cruise, and from climb or cruise to descent. The message is always displayed at the transition to descent from climb or cruise if selected speed is active. It is not displayed if managed speed is active.
SETTING SPD/RTA	II/W	Displayed when the system recomputes its managed speed target to satisfy the RTA constraints.
SPECIF NDB UNAVAIL	II/A	The NDB to be autotuned (specified for a NDB approach) is not available.
SPECIF VOR-D UNAVAIL (also displayed on ND)	II/A	The VOR, VOR-DME, or VORTAC to be autotuned (specified for an RNAV or VOR approach) is not available.
SPD ERROR AT WPTXX	II/W	In lateral managed flight, the system predicts that the aircraft will miss a speed constraint by more than 10 kt. When the prediction changes to bring the miss within 5 kt, the message is cleared.

MESSAGE	TYPE/COLOR	CONDITIONS
SPD LIM EXCEEDED	II/A	The aircraft is more that 150 feet below the speed limit altitude and more than 10 kt over the speed limit.
STEP ABOVE MAX FL	II/W	The pilot has entered a step altitude that is above the predicted maximum altitude.
STEP DELETED	II/W	A step has been deleted for any reason, including sequencing.
STORED ROUTES FULL	I/W	The system already contains five pilot-defined routes. (Only five are allowed.)
TAKEOFF DATA UPLINK (ACARS msg)	II/W	A takeoff data message is received.
TEMPORARY F-PLN EXISTS	I/W	The flight crew has selected any key (except ERASE or INSERT) or attempted a flight planning operation on the secondary flight plan while the system is displaying a temporary flight plan.
TIME ERROR AT WPTXX	II/W	While the aircraft is in lateral managed flight the FMGC predicts that it will miss a time constraint (Refer to 4.04.25).
TIME MARKER LIST FULL	I/W	The system already contains four time markers. (Only four are allowed).
TIME TO EXIT	II/A	The aircraft must leave holding immediately to satisfy fuel reserve requirements. (Extra fuel is zero).
TOO STEEP PATH AHEAD	II/A	The system displays this message in cruise phase if the aircraft is within 150 NM of its destination or in descent or approach phase and in NAV mode and the descent profile contains a segment that is too steep.
TUNE BBB FFF.FF	II/A	The system cannot autotune the VOR for approach or position because of a manual VOR selection.

MESSAGE	TYPE/COLOR	CONDITIONS
UNKNOWN PROGRAM PIN	II/W	The system has been unable to initialize because of an incompatible or undefined aircraft pin program combination (A/C type, engine type, VMO/MMO parity) in the FMGC software.
UPLINK INSERT IN PROG (ACARS msg)	II/W	Displayed when an uplink message is currently inserted in the FMGS.
USING COST INDEX-NNN	I/W	The system contains a flight plan, and the flight crew tries to enter a zero fuel weight or a gross weight into it before defining a Cost Index (CI). The FMGC defaults to the cost index from the last flight.
WAIT FOR SYSTEM RESPONSE	II/W	The MCDU displays the SUBSYSTEM WAIT page.
WIND DATA UPLINK (ACARS msg)	II/W	Uplink wind message has been received.
WIND UPLINK EXISTS (ACARS msg)	I/W	A flight plan modification (active or secondary) is attempted when uplink winds are not inserted yet.
WIND UPLINK PENDING (ACARS msg)	II/A	A temporary flight plan exists or a DIR TO page is displayed and a wind uplink is received and stored.
XXXX IS DESELECTED	I/W	The flight crew attempts to enter a deselected navaid through the RAD NAV page.

MCDU MESSAGE LIST

The MCDU displays two types in two colors :
Type I : Direct result of a pilot action
Type II : Information about a situation, or a call for pilot action
Type II messages are stored in a first-in/first-out message queue (5 messages max).
They are suppressed, if correct data is entered or when they no longer apply.
The flight crew can clear all messages by pressing the MCDU's CLEAR (CLR) key.
Amber (A) : Important
White (W) : Less important

MESSAGE	TYPE/COLOR	CONDITIONS
ABEAM POINTS LIST FULL	II/W	It is displayed when the number of abeam points exceeds 50, which is the maximum number allowed.
A/C POSITION INVALID	II/A	The position of the aircraft has become invalid. If the message has been cleared and the flight crew attempts to call up the HOLD at PPOS or DIR TO page while the position of the aircraft is still invalid, the message will reappear.
ALIGN IRS	II/A	Appears when the IRS are ready for alignment, but the IRS INIT page is not displayed on either MCDU. The ALIGN IRS message requires that one flight crew member call up the IRS INIT page, to align the IRS.
ALTN F-PLN DELETED	II/W	The Alternate F-PLN has been automatically deleted. This occurs when the F-PLN memory is full, and the system attempts to free up some space.
AOC XXX F-PLN UPLINK (ACARS msg)	II/W	A flight plan is stored in the active or secondary flight plan. XXX is 'ACT' or 'SEC'.
AREA RNP IS XX-XX	II/W	It is displayed when : The RNP value, manually-entered on the PROG page, is larger than the default RNP value associated to the current flight area ; and, when there is no RNP value defined in the navigation database for the active leg or route.
AWY/WPT MISMATCH	I/W	The pilot-entered VIA on the AIRWAYS page does not contain the revised point. If a second airway ident is entered, it must contain the first airway ending point.

MESSAGE	TYPE/COLOR	CONDITIONS
BLOCK IGNORES RTA	II/W	A time constraint existing at initiation of flight planning, or an entry of a time constraint made after initiation of flight planning, are ignored by the fuel planning function.
CABIN RATE EXCEEDED	II/W	The aircraft is within 200 NM of its destination, and the computed rate of descent makes it impossible for the cabin to be repressurized at the maximum rate.
CHECK ALTN WIND (ACARS msg)	II/W	The uplinked alternate cruise flight level differs from the defaulted alternate cruise flight level.
CHECK APPR SELECTION *EFIS PFD (FMA)	II/W	A NON ILS approach is part of the F-PLN and an ILS is manually-tuned on the RAD NAV page. It reminds the crew that APP NAV/FINAL are the available guidance modes for the approach. Displayed when in cruise at less than 100 NM from the top of descent, or in descent, or approach phase.
CHECK CO RTE (ACARS msg)	II/A	The uplinked company route identifier differs from the one specified in the request.
CHECK DATA BASE CYCLE	II/W	The current date does not match the effective date of the active database, and someone attempts to enter a FROM/TO or CO RTE.
CHECK DEST DATA (ACARS msg)	II/A	The aircraft is 180 NM from its destination and the destination QNH, TEMP or WIND displayed on the PERF APPR page, received by ACARS uplink, has to be checked. If a modification of these parameters is performed, creating a conflict with previous data, the message retriggers.
CHECK FLT NBR (ACARS msg)	II/A	The uplinked flight number differs from the flight number specified in the request.
CHECK GW	II/A	The gross weights, computed by the flight management computer and the flight augmentation computer, disagree by more than 7 tonnes (7.7 U.S tons).
CHECK IRS 1(2)(3)/FM POSITION	II/A	Each IRS position is compared to the FM position. The difference is greater than a threshold function of time.

MESSAGE	TYPE/COLOR	CONDITIONS
CHECK QFE	II/A	The transition from the QNH to the QFE reference, when the QFE altitude differs by more than 100 feet from the predicted altitude, with the QNH set on the MCDU by means of the airport elevation in the NAV database.
CHECK TAKEOFF DATA	II/A	– "Following a flight crew entry or modification of one of the take-off parameters, there may be an inconsistency between the take-off runway, the TO shift or the flaps/THS and V1, V2, VR, FLEX TO temperature or derated level. – The flight crew activated the secondary F-PLN in PREFLIGHT or DONE phase"
CLK IS TAKEOFF TIME	II/W	The flight crew has entered an estimated takeoff time (ETT) and the actual time is equal to ETT.
CLOCK/GPS TIME DIFF XX ◁	II/A	The aircraft clock time and GPS time differ by more than XX minutes.
CROSSLOAD ABORTED	II/W	The message displayed on the transmitting MCDU indicates an error in the transmitting process.
CROSSLOAD COMPLETE	II/W	The database crossloading from one FMGC to another was successfully completed.
CRZ FL ABOVE MAX FL	II/W	The flight crew enters a cruise altitude that is above the computed maximum altitude.
CSTR DEL ABOVE CRZ FL	II/W	A flight plan altitude constraint has been deleted because the flight crew has inserted a cruise flight level or step-down altitude that is at, or below, the flight plan constraint.
CSTR DEL UP TO WPT01	II/W	Constraints get deleted because the aircraft transitions to a go-around flight phase before the FMGS sequences the flight plan destination.
DECELERATE Also displayed on PFD	II/W	The aircraft is still in the cruise phase and managed speed, after it reaches the top of descent, and it has not started the descent.
XXXX IS DESELECTED	I/W	The pilot entered a navaid, via the RADNAV or PROG page, that has previously been deselected.

MESSAGE	TYPE/COLOR	CONDITIONS
DEST/ALTN MISMATCH	I/W	The pilot attempts to enter an alternate CO RTE (which starts at an origin that is not the primary flight plan destination).
DEST EFOB BELOW MIN	II/A	The EFOB at destination calculated by the FMS is less than the MIN DEST FOB value specified on the FUEL PRED page, for more than 2 minutes.
DIR TO IN PROCESS	I/W	The flight crew calls up the vertical or lateral revision page on one MCDU, while the DIR TO page is displayed on the other MCDU.
ENTER DEST DATA	II/A	The flight crew has not entered wind, QNH, or temperature for the destination, and the aircraft is 180 NM out.
ENTRY OUT OF RANGE	I/W	The flight crew attempts to enter data that is outside the range specified for the selected field.
FLT NBR UPLINK (ACARS msg)	II/W	A flight number has been added to the uplink flight plan without previous request.
FM DATALINK UNAVAIL (ACARS msg)	II/W	No communication is possible between the ATSU and both FMS.
FM PREDICTIONS LOST	II/A	Due to resets, the predictions of the active F-PLN are unavailable.
FMS1/FMS2 A/C STS DIFF	II/W	Always precedes a transition to independent mode and appears at power-up, if the system detects a difference in one of the following : – NAV database serial number – Performance database – FM operational program – Aircraft and airline pin programs.
FMS1/FMS2 GW DIFF	II/W	Onside and offside aircraft weights differ by 2 tons or more.
FMS1/FMS2 PGM PIN DIFF	II/W	Onside and offside pin programs are different.
FMS1/FMS2 POS DIFF	II/A	Onside and offside positions differ by 5 NM (0.5NM, if GPS installed) or more.
FMS1/FMS2 SPD TGT DIFF	II/W	Onside and offside target speeds differ by 5 knots or more.
FORMAT ERROR	I/W	A data entry does not meet the specified entry format for a given field.

MESSAGE	TYPE/COLOR	CONDITIONS
F-PLN DATALINK IN PROG (ACARS msg)	I/W	A flight plan modification is performed after a F-PLN INIT request has been sent. This message is displayed until the uplink is entirely received.
F-PLN FULL	II/W	As there is insufficient memory in the flight plan, the computer does not accept anymore flight plan data.
GPS PRIMARY LOST ◁ (also displayed on ND)	II/A	GPS PRIMARY mode is lost.
GPS PRIMARY ◁	II/W	The FMS is transitioning to GPS PRIMARY.
GPS IS DESELECTED ◁	II/A	GPS has been manually deselected and the aircraft is 80 NM before the top of descent or in approach phase.
INDEPENDENT OPERATION	II/A	The FMGCs operate independently of each other.
INITIALIZE WEIGHTS	II/A	The zero-fuel weight or block fuel (FOB) is undefined after engine start.
INSERT/ERASE TMPY FIRST	I/W	When performing a DIRECT TO/INTERCEPT revision, if a temporary F-PLN already exists due to a revision other than the DIRECT TO/INTERCEPT revision, no F-PLN waypoint can be inserted from the DIR TO page.
INVALID FLT NBR UPLINK (ACARS msg)	II/W	The uplink message contains a valid flight plan but no flight number.
INVALID PERF UPLINK (ACARS msg)	II/W	The performance uplink message has been rejected.
INVALID ROUTE UPLINK (ACARS msg)	II/W	As an error is detected in the uplink message, it is rejected.
INVALID TAKEOFF UPLINK (ACARS msg)	II/W	The current uplink takeoff data message is rejected.
INVALID WIND UPLINK (ACARS msg)	II/W	The current uplink wind message is rejected.
IRS ONLY NAVIGATION	II/A	The aircraft is neither in an approach or in a terminal area, and : – The aircraft has been in IRS mode for more than 10 minutes, or – The aircraft is in IRS mode and is starting the descent phase.
LAT DISCONT AHEAD	II/A	The next leg is a discontinuity, and the aircraft is 30 seconds away from flying the leg.

MESSAGE	TYPE/COLOR	CONDITIONS
LIST OF 10 IN USE	I/W	The flight crew has tried to enter more than ten stored runways in the database, and all of the first ten are included in a flight plan, or a pilot-stored route.
LIST OF 20 IN USE	I/W	The flight crew has tried to create a PBD, LAT/LONG, or PB-PB, or store a pilot-defined waypoint or navaid when 20 are already in use (in a flight plan or pilot-stored routes).
MACH SEGMENT DELETED	II/W	A constant Mach segment of the active flight plan has been automatically deleted. This occurs when the secondary flight plan or the alternate is activated, or engine out is detected or when the flight phase changes from CRZ to another one.
MANUAL HOLD DELETED	II/W	A manually-entered hold has been deleted, due to a change of the arrival procedure.
MCDU OVERHEATED	II/A	This message is displayed for 15 seconds in case of MCDU overheating.
MORE DRAG (EFIS PFD)	II/A	DES mode is engaged, idle is selected and the aircraft must decelerate to recover the path, or to respect an altitude constraint, a speed limit or a speed constraint.
NAV ACCUR DOWNGRAD (also displayed on ND)	II/A	NAV accuracy downgrades from HIGH to LOW. (See FMGS principles for an explanation).
NAV ACCUR UPGRAD (*EFIS ND)	II/W	NAV accuracy upgrades from LOW to HIGH.
NEW ACC ALT-HHHH	II/W	The acceleration altitude has changed.
NEW CRZ ALT-HHHHH	II/W	The cruise altitude has changed.
NEW THR RED ALT-HHHH	II/W	The thrust reduction altitude has changed.
NO ANSWER TO REQUEST (ACARS msg)	II/W	A crew request was previously sent to the ground, and no answer has been received for 4 minutes.
NO INTERSECTION FOUND	I/W	The system could not find any common waypoint or intersection point through the airway.
NO NAV INTERCEPT	II/A	It is triggered, when NAV mode is armed and, no INTERCEPT waypoint exists before the TO waypoint.

MESSAGE	TYPE/COLOR	CONDITIONS
NON UNIQUE ROUTE IDENT	I/W	The flight crew has tried to enter a company route ident on the new route page that is identical to an existing company route ident (pilot-defined, or in the database).
NOT ALLOWED	I/W	Data entry is not allowed in the selected field. A selection action is also not allowed.
NOT IN DATA BASE	I/W	The pilot is trying to enter or call up a company route ident, a FROM/TO pair, a place defined by place-bearing-distance (PBD) or place-bearing/place-bearing (PB/PB) or an airport navaid, waypoint runway, or navaid frequency (including pilot-defined elements) that is not in the current database.
NOT XMITTED TO ACARS (ACARS msg)	II/W	A pilot request or crew report was sent, but communication was neither established nor acknowledged.
OFST DELETED IN TMPY	II/A	The system automatically deletes an offset from the temporary flight plan, if : – The first leg of the temporary F-PLN is no longer a TF, CF or FM. – Termination of next leg at destination runway and the current distance to go is less than, or equal to, the distance required to reach the path.
ONLY SPD ENTRY ALLOWED	I/W	The pilot is trying to enter a Mach number for a preselected speed value on the CLIMB page.
OPP FMGC IN PROCESS	II/A	The offside FMGC is unhealthy, and the FM system mode is SINGLE. The message indicates that the MCDU, on which the message is displayed, is being driven by the FMGC on the other side.
PERF DATA UPLINK (ACARS msg)	II/W	Performance data is received from the ground.
PILOT ELEMENT RETAINED	I/W	A pilot element is either a waypoint, or a navaid, or a route, or a runway that has been stored by the pilot. This message appears when deleting one of these elements is not allowed.
PILOTS ROUTES FULL	I/W	The system already contains five pilot-defined routes. (only five routes are allowed)
PLACE/WPT MISMATCH	I/W	When using the Along Track Offset function, the entered PLACE is not identical to the revise point.

MESSAGE	TYPE/COLOR	CONDITIONS
PLEASE WAIT	I/W	Resynchronization between both FMGCs is in progress.
PRINT ABORTED	II/A	This message informs the crew that the print task has been aborted due to an FMS reset.
PRINTER NOT AVAILABLE (ACARS msg)	II/W	A printer communication error was detected while printing a report. The printing was terminated.
PROCEDURE RNP IS XX.XX	II/A	The RNP value, manually-entered on the PROG page, is larger than the RNP value defined in the navigation database for the active leg or route.
RESET IRS TO NAV	II/A	The system has an initial position for IRS alignment, or the initial position has changed since IRS alignment, but none of the IRSs are in align mode.
REVISION IN PROCESS	I/W	One MCDU displays an AIRWAY page and another revision is attempted from the other MCDU.
REVISIONS NOT STORED	II/A	This message, displayed when a pilot-defined route or company route (active or secondary flight plan) is stored, indicates that the following elements are not retained : – Pilot-entered holds – Offsets – Modifications to terminal area procedures – Pilot-entered constraints – Pseudo waypoints
RTA DELETED	II/W	A time constraint is automatically deleted : – In case of engine-out – When entering the holding pattern – In case of go-around – At phase transition to approach – At phase transition from approach to climb – When a time constraint is inserted in the same flight plan at a different waypoint – When a DIR TO/ABEAM is performed – When the alternate flight plan is activated
RTA EXISTS	I/W	Displayed if the pilot tries to clear an estimated takeoff time defined by the system.

MESSAGE	TYPE/COLOR	CONDITIONS
RWY/LS MISMATCH	II/A	– During climb, cruise, (ILS or MLS), descent, approach, or go-around, the LS frequency entered on the RAD NAV page does not match the LS associated with the destination runway. – During preflight or takeoff, the LS frequency entered on the RAD NAV page does not match the LS associated with the takeoff runway.
SELECT DESIRED SYSTEM	I/W	The MCDU displays its MENU page.
SELECT HDG/TRK FIRST	I/W	– When in NAV mode, the temporary flight plan is inserted whilst the first leg of the temporary F-PLN does not match with the active leg. The same applies when in the SEC F-PLN. Then the temporary flight plan insertion is rejected, and the message is triggered.
SENSOR IS INVALID	I/W	– The pilot has selected FF or FQ, or FF + FQ, or FQ + FF on the FUEL PRED page and the sole sensor or both of the selected sensors are invalid, or – The flight crew has entered fuel on board only, and the FF sensor is invalid.
SET GREEN DOT SPEED ("SET GREEN DOT" displayed on PFD)	II/W	This message appears when all of the following conditions are met : – Engine-out condition – Aircraft in selected speed mode – FCU-selected speed equal to, or greater than, green-dot speed + 10 knots, and ALT* or ALT not active, or FCU-selected speed equal to or less than green-dot speed – 10 knots.
SET HOLD SPEED (also displayed on PFD)	II/W	The aircraft is in selected speed, the pilot has inserted a hold in the flight plan, the aircraft is 30 seconds or less from the point where it must start decelerating towards hold speed, and the selected speed differs from the hold speed by more than 5 knots.

MESSAGE	TYPE/COLOR	CONDITIONS
SET MANAGED SPEED ("SET MANAGED SPD" is displayed on PFD)	II/W	The target speed is selected for the current phase, but there is no preselected speed for the next flight phase. When this is so, this message is displayed at transitions from climb to cruise, and from climb or cruise to descent. It is always displayed at the transition to descent from climb or cruise, if selected speed is active. It is not displayed, if managed speed is active.
SETTING SPD/RTA	II/W	Displayed when the system recomputes its managed speed target to satisfy the RTA constraints.
SPD ERROR AT WPTXX	II/W	In lateral managed flight, the system predicts that the aircraft will miss a speed constraint by more than 10 knots. When the prediction changes, and brings the miss within 5 knots, the message is cleared.
SPD LIM EXCEEDED	II/A	The aircraft is more that 150 feet below the speed limit altitude, and more than 10 knots over the speed limit.
SPECIF NDB UNAVAIL	II/A	The NDB to be autotuned (specified for a NDB approach) is unavailable.
SPECIF VOR-D UNAVAIL (also displayed on ND)	II/A	The VOR, VOR-DME, or VORTAC to be autotuned (specified for an RNAV or VOR approach) is unavailable.
STEP ABOVE MAX FL	II/W	The pilot has entered a step altitude that is above the predicted maximum altitude.
STEP AHEAD	II/W	Indicates that the aircraft is within 20 NM of the active step point.
STEP DELETED	II/W	A step has been deleted for any reason, including sequencing.
SYSTEM NOT AVAILABLE	I/W	Displayed when an ATC communication via the ATSU has failed.
TAKEOFF DATA UPLINK (ACARS msg)	II/W	A takeoff data message is received.
TMPY F-PLN EXISTS	I/W	The flight crew has selected any key (except ERASE or INSERT), or attempted a flight planning operation on the secondary flight plan while the system is displaying a temporary flight plan.

MESSAGE	TYPE/COLOR	CONDITIONS
TIME ERROR AT WPTXX	II/W	While the aircraft is in lateral managed flight, the FMGC predicts that it will miss a time constraint (Refer to 4.04.30).
TIME MARKER LIST FULL	I/W	The system already contains four time markers. (Only four are allowed).
TIME TO EXIT	II/A	The aircraft must leave holding immediately to satisfy fuel reserve requirements. (Extra fuel is zero).
TOO STEEP PATH AHEAD	II/A	This message is displayed in cruise, if the aircraft is within 150 NM of its destination or in descent or approach phase and in NAV mode and the descent profile contains a segment that is too steep.
TUNE BBB FFF.FF	II/A	The system cannot autotune the VOR for approach or position, because of a manual VOR selection.
UNKNOWN PROGRAM PIN	II/W	The system is unable to initialize, due to an incompatible or undefined aircraft pin program combination (A/C type, engine type, VMO/MMO parity) in the FMGC software.
UPLINK INSERT IN PROG (ACARS msg)	II/W	An uplink message is currently inserted in the FMGS.
USING COST INDEX NNN	I/W	The system contains a flight plan, and the flight crew tries to enter a zero fuel weight or a gross weight into it before defining a Cost Index (CI). The FMGC defaults to the cost index from the last flight.
WAIT FOR SYSTEM RESPONSE	II/W	The MCDU displays the SUBSYSTEM WAIT page.
WIND DATA UPLINK (ACARS msg)	II/W	Uplink wind message has been received.
WIND UPLINK EXISTS (ACARS msg)	I/W	A flight plan modification (active or secondary) is attempted when uplink winds are not yet inserted.
WIND UPLINK PENDING (ACARS msg)	II/A	A temporary flight plan exists, or a DIR TO page is displayed, and a wind uplink is received and stored.

MCDU DATA FORMAT LIST

The following chart lists all the data the pilot may enter on the MCDU.
It also shows the acceptable format for the various data items, the acceptable range, the units of entry, and the MCDU pages on which the data can be entered.
The following codes are used to indicate various data formats :

A : letters
N : numbers
X : letters and numbers

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
ACCEL ALT	See ALT		ft (MSL)	TAKEOFF (ACT/SEC) GO AROUND (ACT/SEC)
ALT	NNNN or NNNNN (leading zeros must be included)	Max alt = 39000 Entry is rounded to the nearest 10 feet	ft (MSL)	PERF CLB PERF DES
ALT CSTR	Same as ALT	Same as ALT	ft (MSL)	VERT REV F-PLN A SEC F-PLN A
AIRWAYS (VIA)	XXXX	If not in data base «NOT IN DATA BASE» is displayed	N/A	LAT REV AIRWAYS ◁
ARPT	AAAA 1 character minimum. 4 maximum.	If AAAA is not in the data base airport file New Runway page is displayed		INIT A (ACT/SEC) LAT REV ALTN F.PLN A-B (ACT/SEC) WAYPOINT DIR TO
BLOCK FUEL	NN.N leading zeros may be omitted.	0-14 without center tank 0-21 with center tank or 0-30.8/0.46	Thousands of Kg or thousands of Lb	INIT B (ACT/SEC)
CABIN RATE	- NNN (- may be omitted)	100 - 999	ft/min	DES FORECAST or CRUISE PERF. PAGE ◁
CG	NN.N	8.0 - 45.0	% MAC	INIT B. (ACT/SEC) FUEL PRED
CHANNEL ◁	NNN	500-699		NEW NAVAID RAD NAV
CLASS (navaid)	AAAAAA (refer to RANGE for exact inputs allowed)	VOR DME VORDME VORTAC LOC, ILS NDB ILSDME MLS ◁ TACAN ◁	N/A	NEW NAVAID
CO RTE	XXXXXXX 7 or 10 characters (pin program)	If not in the NAV data base, a message will be displayed	N/A	INIT A ROUTE SELECTION NEW ROUTE ALTERNATE

ACT/SEC = active or secondary

MCDU DATA FORMAT LIST

The following chart lists all the data the pilot may enter on the MCDU.
It also shows the acceptable format for the various data items, the acceptable range, the units of entry, and the MCDU pages on which the data can be entered.
The following codes are used to indicate various data formats :

A : letters
N : numbers
X : letters and numbers

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
ACCEL ALT	See ALT		ft (MSL)	TAKEOFF (ACT/SEC) GO AROUND (ACT/SEC)
ALT	NNNN or NNNNN (leading zeros must be included)	Max alt = 39000 Entry is rounded to the nearest 10 feet	ft (MSL)	PERF CLB PERF DES
ALT CSTR	Same as ALT	Same as ALT	ft (MSL)	VERT REV F-PLN A SEC F-PLN A
AIRWAYS (VIA)	XXXX	If not in data base «NOT IN DATA BASE» is displayed	N/A	LAT REV AIRWAYS ◁
ARPT	AAAA 1 character minimum. 4 maximum.	If AAAA is not in the database airport file, the New Runway page is displayed		INIT A (ACT/SEC) LAT REV ALTN F.PLN A-B (ACT/SEC) WAYPOINT DIR TO
BLOCK FUEL	NN.N leading zeros may be omitted.	0–80/0–175.2	Thousands of Kg or thousands of Lb	INIT B (ACT/SEC)
CABIN RATE	- NNN (- may be omitted)	100 - 999	ft/min	DES FORECAST or CRUISE PERF. PAGE ◁
CG	NN.N	8.0 - 45.0	% MAC	INIT B. (ACT/SEC) FUEL PRED
CHANNEL ◁	NNN	500-699		NEW NAVAID RAD NAV
CLASS (navaid)	AAAAAA (refer to RANGE for exact inputs allowed)	VOR DME VORDME VORTAC LOC, ILS NDB ILSDME MLS ◁ TACAN ◁	N/A	NEW NAVAID
CO RTE	XXXXXXX 7 or 10 characters (pin program)	If not in the NAV database, a message will be displayed	N/A	INIT A ROUTE SELECTION NEW ROUTE ALTERNATE

ACT/SEC = Active or Secondary

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
COST INDEX	NNN may be entered as 1-3 digits ; leading zeros lay be omitted	0 to 999	Kg/Min or 100 lb/Hr	INIT A (ACT/SEC) PERF CLB (ACT/SEC) PERF CRZ (ACT/SEC) PERF DES (ALT/SEC)
CRS	Same as INB CRD	Same as INB CRS	degrees	RADIO NAV NEW NAVAID NEW RUNWAY
CRZ FL	Must be entered as FLIGHT LEVEL	Maximum FL (see flight level)	Hundred of ft	INIT A (ACT/SEC) PROG
CRZ TEMP	See TEMP		See TEMP	INIT A (ACT/SEC) FUEL PREDICTION
CRZ WIND	See WIND DIR/MAG	See WIND DIR/MAG	See WIND DIR/MAG	INIT A (ACT/SEC) FUEL PREDICTION
DH	NNN	0-700 No is accepted if an ILS APPR is selected	ft	PERF APPR (ACT/SEC)
DIST	NN.N leading and trailing 0's may be omitted.	0-99.9 or 0-999 (or 9999 ◁)	NM NM	HOLD ALTN
DRT TO ◁	"D"NN	Eight possible values		PERF TAKEOFF
EFF WIND ◁	± NNN "+" may be entered as "T" or "TL" "–" may be entered as "H" or "HD" Leading zeros may be omitted If no sign is input, "+" is taken	0-500	kts	CLOSEST AIRPORT EQUI-TIME INIT A SEC INT A
ELV	± NNNN if no sign, + assumed Leading 0's may be omitted	Entry displayed to nearest 10 ft – 400 to 20470 ft (RWY) (or - 1000 to 20470 ft ◁) –2000 to 20470 (NAVAID)	ft (MSL)	 NEW RUNWAY NEW NAVAID
ETT/RTA ◁	HH:MM:SS	00:00:00 to 23:59:59	Hour HH Min MM Sec SS	RTA

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
FF/FQ Sensors	One or both may be entered, Both – /FF + FQ or – / FQ + FF Fuel flow – /FF Fuel Quantity – / FQ		N/A	FUEL PREDICTION
FIG OF MERIT	N	0-3	N/A	NEW NAVAID
FINAL/TIME	Only one may be entered at a time. NN.N or (NNN.N ◁) for FINAL NNNN for TIME	FINAL 0-10.0 (or 0-100 ◁) or 0-22.0 0-90 TIME	Thousand of kg or Thousand of lb minutes	FUEL PRED INIT B
FLAPS		0,1, 2, or 3		TAKEOFF
FLEX TO TEMP	1. If Derated TO option not implemented : same as TEMP 2. If Derated TO option is implemented : F NN		NN in degrees centigrade	TAKEOFF
FLIGHT LEVEL	FLNNN or NNN Leading zeros on NNN may be omitted	Max FL = 390 (or Max FL = 410 ◁)	Hundreds of ft (MSL)	F-PLN A-B, PROG VERT REV INIT A (ACT, SEC) PERF CLB PERF DES STEP PRED STEP ALTS ◁
FLIGHT NUMBER	XXXXXXXX The 8 alphanumeric are not mandatory	N/A	N/A	INIT A F-PLN A-B
FOB	NN.N (leading zeros may be omitted)	Same as BLOCK	Thousands of kg or Thousands of Lb	FUEL PREDICTION
FREQ	NNN.NN ILS/VOR NNN.N NDB	108.00 - 117.95 190.0 - 1750.0	MHz KHz	PROG. NEW NAVAID RADIO NAV
FROM/TO	AAAA /AAAA	AAAA must be in data base or message will be displayed	N/A	INIT A (ACT/SEC)
GW	NN.N Leading and trailing zeros may be omitted	35-99.9 or 77.2 - 218	Thousands of kg or Thousands of Lb	FUEL PREDICTION

ACT/SEC = active or secondary

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
COST INDEX	NNN may be entered as 1-3 digits ; leading zeros lay be omitted	0 to 999	Kg/Min or 100 lb/Hr	INIT A (ACT/SEC) PERF CLB (ACT/SEC) PERF CRZ (ACT/SEC) PERF DES (ALT/SEC)
CRS	Same as INB CRD	Same as INB CRS	degrees	RADIO NAV NEW NAVAID NEW RUNWAY
CRZ FL	Must be entered as FLIGHT LEVEL	Maximum FL (see flight level)	Hundred of ft	INIT A (ACT/SEC) PROG
CRZ TEMP	± NN If no sign, - assumed	± 99	Degrees Celsius	INIT A (ACT/SEC) FUEL PREDICTION
CRZ WIND	See WIND DIR/MAG	See WIND DIR/MAG	See WIND DIR/MAG	INIT A (ACT/SEC) FUEL PREDICTION
DH	NNN	0-700 No is accepted if an ILS APPR is selected	ft	PERF APPR (ACT/SEC)
DIST	NN.N leading and trailing 0's may be omitted.	0-99.9 or 0-999 (or 9999 ◁)	NM NM	HOLD ALTN
DRT TO ◁	"D"NN	Eight possible values		PERF TAKEOFF
EFF WIND ◁	± NNN "+" may be entered as "T" or "TL" "–" may be entered as "H" or "HD" Leading zeros may be omitted If no sign is input, "+" is taken	0-500	kts	CLOSEST AIRPORT EQUI-TIME INIT A SEC INT A
ELV	± NNNN if no sign, + assumed Leading 0's may be omitted	Entry displayed to nearest 10 ft – 400 to 20470 ft (RWY) (or - 1000 to 20470 ft ◁) –2000 to 20470 (NAVAID)	ft (MSL)	 NEW RUNWAY NEW NAVAID
ETT/RTA ◁	HH:MM:SS	00:00:00 to 23:59:59	Hour HH Min MM Sec SS	RTA

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
FF/FQ Sensors	One or both may be entered, Both – /FF + FQ or – / FQ + FF Fuel flow – /FF Fuel Quantity – / FQ		N/A	FUEL PREDICTION
FIG OF MERIT	N	0-3	N/A	NEW NAVAID
FINAL/TIME	Only one may be entered at a time. NN.N or (NNN.N ◁) for FINAL NNNN for TIME	FINAL 0-10.0 (or 0-100 ◁) or 0-22.0 0-90 TIME	Thousand of kg or Thousand of lb minutes	FUEL PRED INIT B
FLAPS		0,1, 2, or 3		TAKEOFF
FLEX TO TEMP	1. If Derated TO option not implemented : same as TEMP 2. If Derated TO option is implemented : F NN		NN in degrees centigrade	TAKEOFF
FLIGHT LEVEL	FLNNN or NNN Leading zeros on NNN may be omitted	Max FL = 390 (or Max FL = 410 ◁)	Hundreds of ft (MSL)	F-PLN A-B, PROG VERT REV INIT A (ACT, SEC) PERF CLB PERF DES STEP PRED STEP ALTS ◁
FLIGHT NUMBER	XXXXXXXX The 8 alphanumeric are not mandatory	N/A	N/A	INIT A F-PLN A-B
FOB	NN.N (leading zeros may be omitted)	Same as BLOCK	Thousands of kg or Thousands of Lb	FUEL PREDICTION
FREQ	NNN.NN ILS/VOR NNN.N NDB	108.00 - 117.95 190.0 - 1750.0	MHz KHz	PROG. NEW NAVAID RADIO NAV
FROM/TO	AAAA /AAAA	AAAA must be in data base or message will be displayed	N/A	INIT A (ACT/SEC)
GW	NN.N Leading and trailing zeros may be omitted	35-99.9 or 77.2 - 218	Thousands of kg or Thousands of Lb	FUEL PREDICTION

ACT/SEC = active or secondary

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
IDLE FACTOR ◁	± N.N Leading and trailing zeros may be omitted	– 9.9. +9.9	%	A/C STATUS
INB CRS	NNN Leading zeros may be omitted. An entry of 360 is displayed as 0.	000-359	Degrees	HOLD
LAT	DDMM.MB or BDDMM.M DD – degrees, MM.M – minutes, B – direction. Leading zeros may be omitted but the direction (B) is necessary. Latitude is displayed as DDMM.MB	B : N or S 0 ≤ DD ≤ 90 0 ≤ MM.M ≤ 59.9	Degree minutes tenths of minutes	INIT A (ACT/SEC)
LAT/LONG	LAT/LONG Same as LAT and LONG except both must be entered with "/" in between	Same as LAT and LONG	Same as LAT and LONG	F-PLN A-B (ACT/SEC) PROG NEW WAYPOINT NEW NAVAID DIR TO LAT REV NEW RUNWAY
LENGTH	NNNN Leading zeros may be omitted	1000-8000 m 3282-9999 ft	Meters or feet	NEW RUNWAY
LONG	DDDMM.MB or BDDDMM.M DDD – degrees MM.M – minutes B – direction. Leading zeros may be omitted but the direction (B) is necessary	B : E or W 0 ≤ DDD ≤ 180 0 ≤MM.M ≤ 59	Degree minutes tenths of minutes	INIT A
MACH	.NN The decimal point is necessary. Trailing zeros are not necessary	MAX = .82 MIN = .15	Mach Number	F.PLN A (ACT/SEC) PERF CLB PERF CRZ PERF DES
MACH/SPD	MACH and SPD must be entered with "/" between (see MACH and SPD formats)	Same as MACH and SPD	Same as MACH and SPD	PERF DES (ACT/SEC)

ACT/SEC = active or secondary

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
MDA	Same as ALT	Ldg elevation to ldg elevation + 5000	ft (MSL)	PERF APPR (ACT/SEC)
MDH	± NNNNN	0 – 5000	ft (AGL)	PERF APPR (ACT/SEC)
NAVAID	XXXX	Any alphanumeric	N/A	PROG NEW NAVAID NAVAID F.PLN A-B (ACT/SEC) LAT REV DIR TO RADIO NAV SELECTED NAVAIDS
OFST	NNB or BNN NN offset distance B direction	B : L or R 1 < NN < 50	NM	LAT REV
PERF FACTOR	NN.N leading or trailing zeros may be omitted (± N.N)	– 10.0 to + 10.0 (or – 9.9 - + 9.9 ◁)	N/A	A/C STATUS
PLACE/BRG/DIST	PLACE can be any data base ARPT, NAVAID or WAYPOINT - BRG must be a 3 digit entry without decimal digit. An entry of BRG = 360 is displayed as 0.	PLACE - If not in data base, a message «NOT IN DATA BASE » is displayed BRG - 000-360	N/A degrees	LAT REV (ACT/SEC) NEW WAYOINT PROG DIR TO F-PLN A-B (ACT/SEC) STEP ALTS ◁
	DIST is NNN.N where leading zeros may be omitted ; all 3 parameters must be entered with "/" between	DIST - 0-999.9	NM	
PLACE-BRG/ PLACE-BRG	Same as above, A couple PLACE-BRG is entered with a dash in the middle. 2 couples have to be entered with "/" between	Same as above	Same as above	Same as above

ACT/SEC = active or secondary

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
IDLE FACTOR ◁	± N.N Leading and trailing zeros may be omitted	– 9.9. +9.9	%	A/C STATUS
INB CRS	NNN Leading zeros may be omitted. An entry of 360 is displayed as 0.	000-359	Degrees	HOLD
LAT	DDMM.MB or BDDMM.M DD – degrees, MM.M – minutes, B – direction. Leading zeros may be omitted but the direction (B) is necessary. Latitude is displayed as DDMM.MB	B : N or S 0 ≤ DD ≤ 90 0 ≤ MM.M ≤ 59.9	Degree minutes tenths of minutes	INIT A (ACT/SEC)
LAT/LONG	LAT/LONG Same as LAT and LONG except both must be entered with "/" in between	Same as LAT and LONG	Same as LAT and LONG	F-PLN A-B (ACT/SEC) PROG NEW WAYPOINT NEW NAVAID DIR TO LAT REV NEW RUNWAY
LENGTH	NNNN Leading zeros may be omitted	1000-8000 m 3282-9999 ft	Meters or feet	NEW RUNWAY
LONG	DDDMM.MB or BDDDMM.M DDD – degrees MM.M – minutes B – direction. Leading zeros may be omitted but the direction (B) is necessary	B : E or W 0 ≤ DDD ≤ 180 0 ≤MM.M ≤ 59	Degree minutes tenths of minutes	INIT A
MACH	.NN The decimal point is necessary. Trailing zeros are not necessary	MAX = .82 MIN = .15	Mach Number	F.PLN A (ACT/SEC) PERF CLB PERF CRZ PERF DES
MACH/SPD	MACH and SPD must be entered with "/" between (see MACH and SPD formats)	Same as MACH and SPD	Same as MACH and SPD	PERF DES (ACT/SEC)

ACT/SEC = active or secondary

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
MDA	Same as ALT	Ldg elevation to ldg elevation + 5000	ft (MSL)	PERF APPR (ACT/SEC)
MDH	± NNNNN	0 – 5000	ft (AGL)	PERF APPR (ACT/SEC)
MIN DEST FOB	NNN.N (leading zeros may be omitted)	0–80.0 tons	Thousands of kg or Lb (OPC option)	INIT B FUEL PRED (ACT/SEC)
NAVAID	XXXX	Any alphanumeric	N/A	PROG NEW NAVAID NAVAID F.PLN A-B (ACT/SEC) LAT REV DIR TO RADIO NAV SELECTED NAVAIDS
OFST	NNB or BNN NN offset distance B direction	B : L or R 1 < NN < 50	NM	LAT REV
PERF FACTOR	NN.N leading or trailing zeros may be omitted (± N.N)	– 10.0 to + 10.0 (or – 9.9 - + 9.9 ◁)	N/A	A/C STATUS
PLACE/BRG/DIST	PLACE can be any data base ARPT, NAVAID or WAYPOINT - BRG must be a 3 digit entry without decimal digit. An entry of BRG = 360 is displayed as 0.	PLACE - If not in data base, a message «NOT IN DATA BASE» is displayed BRG - 000-360	N/A degrees	LAT REV (ACT/SEC) NEW WAYPOINT PROG DIR TO F-PLN A-B (ACT/SEC) STEP ALTS ◁
	DIST is NNN.N where leading zeros may be omitted ; all 3 parameters must be entered with "/" between	DIST - 0-999.9	NM	

ACT/SEC = active or secondary

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
PLACE/DIST ◁	PLACE : same as for PLACE/BRG/DIST DIST : same as for PLACE/BRG/DIST	PLACE : same as for PLACE/BRG/DIST DIST : 0–999–9	N/A NM	F–PLN A and B SEC F–PLN A and B LAT REV NEW WAYPOINT DIR TO STEP ALTS
QNH	NNNN (leading zero may be omitted). NN.NN (leading and trailing zeros may be omitted).	950-1050 (or 745-1050 ◁) 28.06. - 31.01 (or 22.00 - 31.00 ◁)	Hecto-Pascals (hPa) In.Hg	PERF APPR (ACT/SEC)
RADIAL IN ◁	NNN(T) 3 digits entry	000–360	Degrees	DIR TO
RADIAL OUT ◁	NNN(T) 3 digits entry	000–360	Degrees	DIR TO FIX INFO 1 and 2
RTE RSV	may be entered as fuel or percentage of trip fuel	Fuel 0- (0.0) 0-21.7 % : 0-15	thousands of kg thousands of lb	INIT B (ACT/SEC) FUEL PRED
RWY	AAAANND Where AAAA is same as ARPT. NN is runway number (2 digits) must be entered D is L or R to be included only when there is more than one runway with the same number at ARPT.			RUNWAY NEW RUNWAY F.PLN A-B
SAT/ALT ◁	TEMP/ALT	See TEMP and ALT	N/A	CRUISE WIND
SET HDG ◁	NNN/N (leading and trailing zeros may be omitted) will always be displayed as NNN/N	000,0 – 360.0	Degrees	IRS MONITOR
SLOPE ◁	NN.N	00.0–90.0	Degrees	NEW NAVAID
SPD	NNN (must be 3 numerics)	MAX = 350 kt MIN = 100 kt	kt (CAS)	SEC F.PLN A PERF CLB PERF CRZ (ACT, SEC) PERF DES

ACT/SEC = active or secondary

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
SPD CSTR	Same as SPD	Same as SPD	kt (CAS)	F.PLN A (ACT/SEC) VERT REV (ACT/SEC)
SPD LIM	SSS/NNNNN SSS is a speed NNNNN is an ALT or FLIGHT LEVEL (see ALT and FLIGHT LEVEL)	SSS same as SPD	kt/ft (MSL)	VERT REV (ACT/SEC)
SPD/MACH	See MACH/SPD	Same as MACH and SPD	Same as MACH and SPD	PERF DES (ACT/SEC)
STATION DEC	NND Where NN is the declination and D is the direction. Leading zeros may be omitted. D is not required for an entry of zero declination.	NN : 01-99 D : E or W	Degrees	NEW NAVAID
STEP ALT ◁	SNNN or NNNS (where NNN is in Flight Level) or SNNNNN or NNNNNS (where NNNNN is in ALT) Leading zeros may be omitted	Same as Flight Level or ALT	Same as Flight Level or ALT	F–PLN A
TAXI	N.N Leading or trailing zeros may be omitted	0-9.9	Thousands of kg	INIT B (ACT/SEC)
TEMP	± NN If no sign, + assumed	± 99	Degrees celsius	INIT A (ACT/SEC) FUEL PRED PERF APPR
THR RED ALT	See ALT	400 ft AGL mini	ft (MSL)	PERF TAKE OFF
THS	AAN.N or N.NAA where AA is UP or DN	max UP 7.0 max DN 5.0 increment .1	degrees	PERF TAKEOFF
TRANS ALT	See ALT			PERF GO AROUND
TIME	N.N	0-9.9	Minutes	HOLD

(ACT/SEC) = active or secondary

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
PLACE-BRG/ PLACE-BRG	Same as above, A couple PLACE-BRG is entered with a dash in the middle. 2 couples have to be entered with "/" between	Same as above	Same as above	Same as above
PLACE/DIST ◁	PLACE : same as for PLACE/BRG/DIST DIST : same as for PLACE/BRG/DIST	PLACE : same as for PLACE/BRG/DIST DIST : 0-999-9	N/A NM	F–PLN A and B SEC F–PLN A and B LAT REV NEW WAYPOINT DIR TO STEP ALTS
QNH	NNNN (leading zero may be omitted).	745 - 1050 (or 745 - 1100 ◁)	Hecto-Pascals (hPa)	PERF APPR (ACT/SEC)
	NN.NN (leading and trailing zeros may be omitted).	22.00 - 31.00 (or 22.00 - 32.48 ◁)	In.Hg	
RADIAL ◁	NNN(T) 3 digits entry	000-360	Degrees	RADIAL FIX INFO 1 and 2
RADIAL IN ◁	NNN(T) 3 digits entry	000-360	Degrees	DIR TO
RADIAL OUT ◁	NNN(T) 3 digits entry	000-360	Degrees	DIR TO FIX INFO 1 and 2
REF FIX ◁	See waypoint			RADIAL FIX INFO 1 and 2
RTE RSV	may be entered as fuel or percentage of trip fuel	Fuel 0- (0.0) 0-21.7 % : 0-15	thousands of kg thousands of lb	INIT B (ACT/SEC) FUEL PRED
RWY	AAAANND			
	Where AAAA is same as ARPT.			RUNWAY NEW RUNWAY F.PLN A-B
	NN is runway number (2 digits) must be entered			
	D is L or R to be included only when there is more than one runway with the same number at ARPT.			
SAT/ALT	TEMP/ALT	See TEMP and ALT	N/A	CRUISE WIND

ACT/SEC = active or secondary

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
SET HDG ◁	NNN/N (leading and trailing zeros may be omitted) will always be displayed as NNN/N	000,0 – 360.0	Degrees	IRS MONITOR
SLOPE ◁	NN.N	00.0–90.0	Degrees	NEW NAVAID
SPD	NNN (must be 3 numerics)	MAX = 350 kt MIN = 100 kt	kt (CAS)	SEC F.PLN A PERF CLB PERF CRZ (ACT, SEC) PERF DES
SPD CSTR	Same as SPD	Same as SPD	kt (CAS)	F.PLN A (ACT/SEC) VERT REV (ACT/SEC)
SPD LIM	SSS/NNNNN SSS is a speed NNNNN is an ALT or FLIGHT LEVEL (see ALT and FLIGHT LEVEL)	SSS same as SPD	kt/ft (MSL)	VERT REV (ACT/SEC)
SPD/MACH	See MACH/SPD	Same as MACH and SPD	Same as MACH and SPD	PERF DES (ACT/SEC)
STATION DEC	NND Where NN is the declination and D is the direction. Leading zeros may be omitted. D is not required for an entry of zero declination.	NN : 01-99 D : E or W	Degrees	NEW NAVAID
STEP ALT	SNNN or NNNS (where NNN is in Flight Level) or SNNNNN or NNNNNS (where NNNNN is in ALT) Leading zeros may be omitted	Same as Flight Level or ALT	Same as Flight Level or ALT	F–PLN A
TAXI	N.N Leading or trailing zeros may be omitted	0-9.9	Thousands of kg	INIT B (ACT/SEC)

(ACT/SEC) = active or secondary

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
TIME MARK. ◁	HHMM	HH : 0–23 MM : 0–59	Hours Minutes	F–PLN A and B
T.O. SHIFT	NNNN	1-Length of origin runway	m or ft	PERF TAKEOFF
TRIP WIND	See EFF WIND		kts	INIT A SET INIT A
TROPO	Same as ALT	Same as ALT (or 60 000 ◁)	ft	INIT A FUEL PREDICTION SEC FUEL PREDICTION
UTC CSTR	HH MM Where HH are hours and MM are minutes. Leading zeros may be omitted 1 or 2 digit entry is interpretated as minutes	HH = 0.23 MM = 0.59	Hours and minutes	VERT REV
V1	Same as SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC)
V2	Same as SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC)
VR	Same as SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC)
WIND	Same as WIND DIR/VELOCITY	Same as WIND DIR/VELOCITY	Same as WIND DIR/VELOCITY	F.PLN B (ACT/SEC) FUEL PREDICTION
WAYPOINT	XXXXX - may be from . 1-5 (1-7 ◁) characters for waypoint. Acceptable as waypoint IDENT : ARPT NAVAID WAYPOINT LAT/LONG, PLACE BRG/ PLACE BRG and PLACE/BRG/ DIST PLACE /DIST ◁ may be entered to define a waypoint			WAYPOINT NEW WAYPOINT F.PLN A and B (ACT/SEC) LAT REV PROG DIR TO FIX INFO ◁ 1 AND 2 EQUI–TIME POINT ◁ STEP ALTS ◁ PREDICTIVE GPS ◁

(ACT/SEC) = active or secondary

R

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
WIND DIR/WIND MAG	NNN/NNN Both must be entered ; leading zeros may be omitted. An entry of WIND DIR = 360 is displayed as 0.	WIND DIRECTION 0-360 WIND MAG 0–200 (or 0–500 ◁)	Degrees Kt	INIT A PERF APPR (ACT/SEC) STEP PRED WIND F-PLN B VERT REV
WIND DIRECTION/ MAG/ALT	NNN/NNN/FL NNN or NNN/NNN/NN NNN	Direction and Velocity as above Minimum ALT 1000	FL in hundred of ft, ALT in ft	DES FORECAST WIND PAGES ◁
ZFW	NN.N OR NNN.N Leading and trailing zeros may be omittted	35.0-80.0 or 77.1 - 176.0	Thousands of kg or thousands of Lb	INIT B (ACT/SEC)

(ACT/SEC) = active or secondary

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
TEMP	± NN If no sign, + assumed	± 99	Degrees celsius	PERF TAKEOFF PERF APPR
THR RED ALT	See ALT	400 ft AGL mini	ft (MSL)	PERF TAKE OFF
THS	AAN.N or N.NAA where AA is UP or DN	max UP 7.0 max DN 5.0 increment .1	degrees	PERF TAKEOFF
TRANS ALT	See ALT			PERF TAKEOFF PERF GO AROUND
TRANS FL	See FLIGHT LEVEL			PERF APPR
TIME	N.N	0-9.9	Minutes	HOLD
TIME MARK.	HHMM	HH : 0–23 MM : 0–59	Hours Minutes	F–PLN A and B
T.O. SHIFT	NNNN	1-Length of origin runway	m or ft	PERF TAKEOFF
TRIP WIND	See EFF WIND		kts	INIT A SET INIT A
TROPO	Same as ALT	Same as ALT (or 60 000 ◁)	ft	INIT A FUEL PREDICTION SEC FUEL PREDICTION
UTC CSTR	HH MM Where HH are hours and MM are minutes. Leading zeros may be omitted 1 or 2 digit entry is interpretated as minutes	HH = 0.23 MM = 0.59	Hours and minutes	VERT REV
V1	Same as SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC)
V2	Same as SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC)
VR	Same as SPD		kt (CAS)	PERF TAKEOFF (ACT/SEC)
WIND	Same as WIND DIR/VELOCITY	Same as WIND DIR/VELOCITY	Same as WIND DIR/VELOCITY	F.PLN B (ACT/SEC) FUEL PREDICTION

(ACT/SEC) = active or secondary

DATA NAME	FORMAT	RANGE (X is input)	UNITS	DISPLAY PAGE
WAYPOINT	XXXXX - may be from . 1-5 (1-7 ◁) characters for waypoint. Acceptable as waypoint IDENT : ARPT NAVAID WAYPOINT LAT/LONG, PLACE BRG/ PLACE BRG and PLACE/BRG/ DIST PLACE /DIST ◁ may be entered to define a waypoint			WAYPOINT NEW WAYPOINT F.PLN A and B (ACT/SEC) LAT REV PROG DIR TO FIX INFO ◁ 1 AND 2 EQUI–TIME POINT ◁ STEP ALTS ◁ PREDICTIVE GPS ◁
WIND DIR/WIND MAG	NNN/NNN Both must be entered ; leading zeros may be omitted. An entry of WIND DIR = 360 is displayed as 0.	WIND DIRECTION 0-360 WIND MAG 0–250	Degrees Kt	INIT A PERF APPR (ACT/SEC) STEP PRED WIND F-PLN B VERT REV
WIND DIRECTION/ MAG/ALT	NNN/NNN/FL NNN or NNN/NNN/NN NNN	Direction and Velocity as above Minimum ALT 1000	FL in hundred of ft, ALT in ft	DES FORECAST WIND PAGES ◁
ZFW	NN.N OR NNN.N Leading and trailing zeros may be omittted	35.0-80.0 or 77.1 - 176.0	Thousands of kg or thousands of Lb	INIT B (ACT/SEC)

(ACT/SEC) = active or secondary

4.04.00 CONTENTS

4.04.10 LATERAL FUNCTIONS

GENERAL 1
TEMPORARY (TMPY) F-PLN 2
INSERTING AN AIRWAY WITH "VIA/GO TO" 3
INSERTING A WAYPOINT 4
INSERTING A NEW DESTINATION 7
HOLDING PATTERN 8
OFFSET 19
ALTERNATE FUNCTION 21
DIR KEY (DIRECT-TO FUNCTION) 26
OVERFLY (OVFY) KEY 29
UPDATE AT 30

4.04.20 VERTICAL FUNCTIONS

GENERAL 1
TIME CONSTRAINT 2
WIND 3

4.04.30 OTHER FUNCTIONS

EFFECT OF REFERENCE BAROMETER SETTING 1
CLEAR KEY (CLEARING FUNCTION) 5
HOW TO EXECUTE A DIVERSION 6
ENGINE OUT 10
SECONDARY FLIGHT PLAN 17
STORED ROUTE FUNCTION 19

4.04.40 AOC FUNCTIONS ◁

4.04.50 PRINT FUNCTION ◁

4.04.00 CONTENTS

4.04.15 LATERAL FUNCTIONS

GENERAL 1
TEMPORARY (TMPY) F-PLN 2
INSERTING AN AIRWAY WITH "VIA" 3
INSERTING A WAYPOINT 6
FIX INFO 11
INSERTING A NEW DESTINATION 14
HOLDING PATTERN 15
OFFSET 26
ALTERNATE FUNCTION 28
ENABLE ALTN 31
DIR KEY (DIRECT-TO FUNCTION) 33
OVERFLY (OVFY) KEY 41
UPDATE AT 42

4.04.25 VERTICAL FUNCTIONS

GENERAL 1
REQUIRED TIME OF ARRIVAL (RTA) 2
WIND – TEMPERATURE – QNH 4
CONSTANT MACH SEGMENT 12

4.04.30 OTHER FUNCTIONS

EFFECT OF REFERENCE BAROMETER SETTING 1
CLEAR KEY (CLEARING FUNCTION) 5
HOW TO EXECUTE A DIVERSION 6
ENGINE OUT 10
SECONDARY FLIGHT PLAN 17
STORED ROUTE FUNCTION 19
EQUITIME POINT 22
CLOSEST AIRPORTS 24
TIME MARKER 27
STEP ALTS 28
REQUIRED TIME OF ARRIVAL (RTA) 34
REPORT PAGE 37

4.04.40 AOC FUNCTIONS ◁

4.04.50 PRINT FUNCTION ◁

4.04.00 CONTENTS

4.04.18 LATERAL FUNCTIONS

GENERAL 1
TEMPORARY F-PLN (TMPY) 2
R INSERTING AN AIRWAY WITH "VIA" 3
INSERTING A WAYPOINT 4
INSERTING A NEW DESTINATION 8
HOLDING PATTERN 9
OFFSET 20
ALTERNATE FUNCTION 22
DIR KEY (DIRECT-TO FUNCTION) 27
OVFY (OVERFLY) KEY 35
UPDATE AT 36
CHANGING THE DEPARTURE/ARRIVAL 38
R RADIAL FIX INFO 42

4.04.28 VERTICAL FUNCTIONS

GENERAL 1
TIME CONSTRAINT/RTA 2
WIND-TEMPERATURE-QNH 3
R CONSTANT MACH 10

4.04.30 OTHER FUNCTIONS

EFFECT OF BARO REFERENCE SETTING 1
CLEAR KEY (CLEARING FUNCTION) 5
HOW TO EXECUTE A DIVERSION 6
ENGINE OUT 10
SECONDARY FLIGHT PLAN 17
STORED ROUTE FUNCTION 19
REPORT PAGE 22
CLOSEST AIRPORTS 24
TIME MARKER 27
STEP ALTS 28
REQUIRED TIME OF ARRIVAL (RTA) 34
EQUI-TIME POINT 37

4.04.40 AOC FUNCTIONS

4.04.50 PRINT FUNCTION

4.04.00 CONTENTS

4.04.15 LATERAL FUNCTIONS

GENERAL 1
TEMPORARY (TMPY) F-PLN 2
INSERTING AN AIRWAY WITH "VIA" 3
INSERTING A WAYPOINT 6
FIX INFO 11
INSERTING A NEW DESTINATION 14
HOLDING PATTERN 15
OFFSET 26
ALTERNATE FUNCTION 28
ENABLE ALTN 31
DIR KEY (DIRECT-TO FUNCTION) 33
OVERFLY (OVFY) KEY 41
UPDATE AT 42

4.04.25 VERTICAL FUNCTIONS

GENERAL 1
REQUIRED TIME OF ARRIVAL (RTA) 2
WIND – TEMPERATURE – QNH 4
CONSTANT MACH SEGMENT 12

4.04.30 OTHER FUNCTIONS

EFFECT OF REFERENCE BAROMETER SETTING 1
CLEAR KEY (CLEARING FUNCTION) 5
HOW TO EXECUTE A DIVERSION 6
ENGINE OUT 10
SECONDARY FLIGHT PLAN 17
STORED ROUTE FUNCTION 19
EQUITIME POINT 22
CLOSEST AIRPORTS 24
TIME MARKER 27
STEP ALTS 28
REQUIRED TIME OF ARRIVAL (RTA) 34
REPORT PAGE 37

R **4.04.32 POLAR NAVIGATION**

4.04.40 AOC FUNCTIONS ◁

4.04.50 PRINT FUNCTION ◁

GENERAL

The lateral revision function allows the pilot to create or modify the following parts of the flight plan :

- airway
- waypoint
- new destination
- holding pattern
- offset
- alternate

  Each time the pilot activates one the revisions listed above, he accesses to a temporary flight plan that allows to check the modification before inserting it in the active flight plan. The pilot selects these functions by pressing the left line select key on F-PLN A or B.
- Direct to and overfly functions are accessed through MCDU keys. No temporary flight plan is created with these functions.
- "Update at" capability is a specific function that manually update the FM position. It does not use a temporary flight plan, but the crew must confirm the insertion before it is activated.

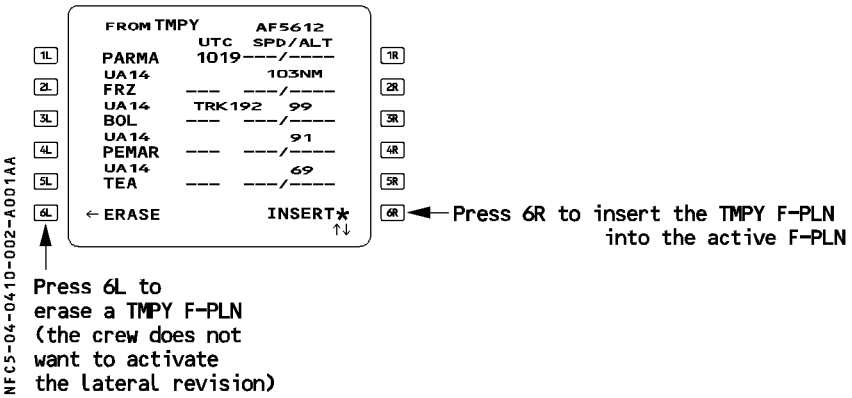
TEMPORARY F-PLN (TMPY)

When a pilot makes a lateral revision to the F-PLN, the FMGS creates a temporary flight plan. This is a copy of the active F-PLN, but is corrected by the lateral revision in progress. The aircraft continues to follow the active F-PLN until the temporary revision is inserted. The revision appears in yellow characters on both MCDUs and NDs.

- Lateral and vertical revisions cannot be made to a temporary F-PLN.
- Only one temporary F-PLN may be accessed at a time.
- The "DIRECT TO" function, when used, erases a temporary F-PLN.

R
- When a DIR TO is in process, a temporary revision cannot be displayed on the other MCDU.

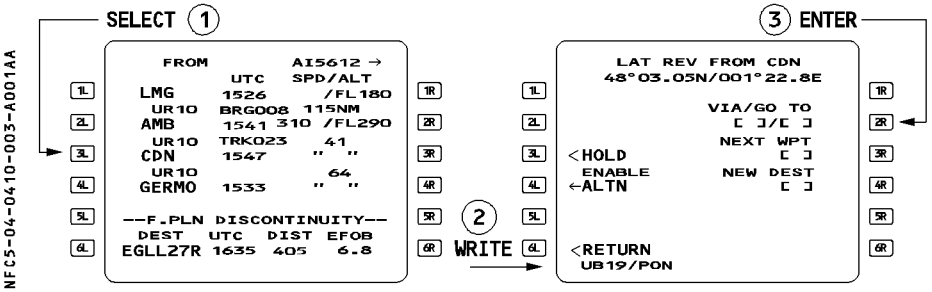
- A TMPY F-PLN changes the title of the flight plan pages. (TMPY appears in all titles).
- No predictions are computed for a temporary flight plan (Dashes are displayed).



Temporary data are displayed first in yellow (ND and MCDU). Once inserted they become active and are displayed in green.

INSERTING AN AIRWAY WITH "VIA/GO TO"

The pilot can insert into the active flight plan, an airway going from a revised waypoint to another waypoint. If the end waypoint belongs to the active flight plan, the computer does the stringing automatically. If the end waypoint does not belong to the flight plan, the computer leaves a discontinuity between this waypoint and those farther along the active flight plan.



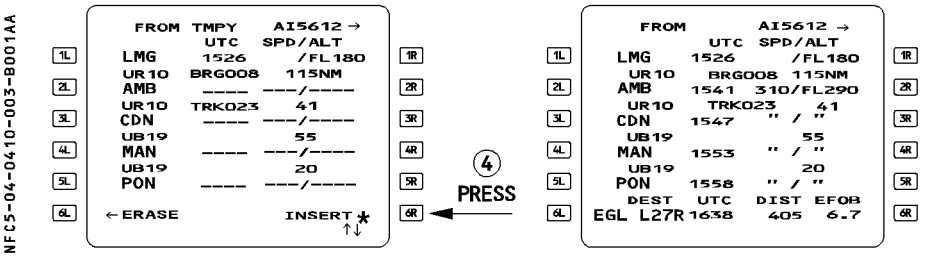
– SELECT the revised waypoint (here CDN).

– WRITE the airway and the ending waypoint in the scratchpad (here UB19/PON).

– PRESS [2R] to insert the airway and ending waypoint into the VIA/GO TO field.

The MCDU displays TMPY in yellow and lists the waypoints en route to the ending waypoint.

– PRESS [6R] to insert the temporary flight plan. Clear the flight plan discontinuity as necessary.



Note : 1. If the revised waypoint or the end waypoint does not belong to the airway, the MCDU displays the message "AWY/WPT MISMATCH".

R *2. If two waypoints with the same ident belong to the same airway, the DUPLICATE*
R *NAMES page will not be called and the system selects the first one in the*
R *database.*

INSERTING A WAYPOINT

The pilot can insert waypoints by two methods :
- directly into the flight plan. All modifications go directly into the active flight plan. No temporary flight plan is created.
- by means of a lateral-revision "NEXT WAYPOINT", a process that creates a temporary flight plan.

The second method allows to check the temporary flight plan before inserting it.

WAYPOINT IDENTIFICATION

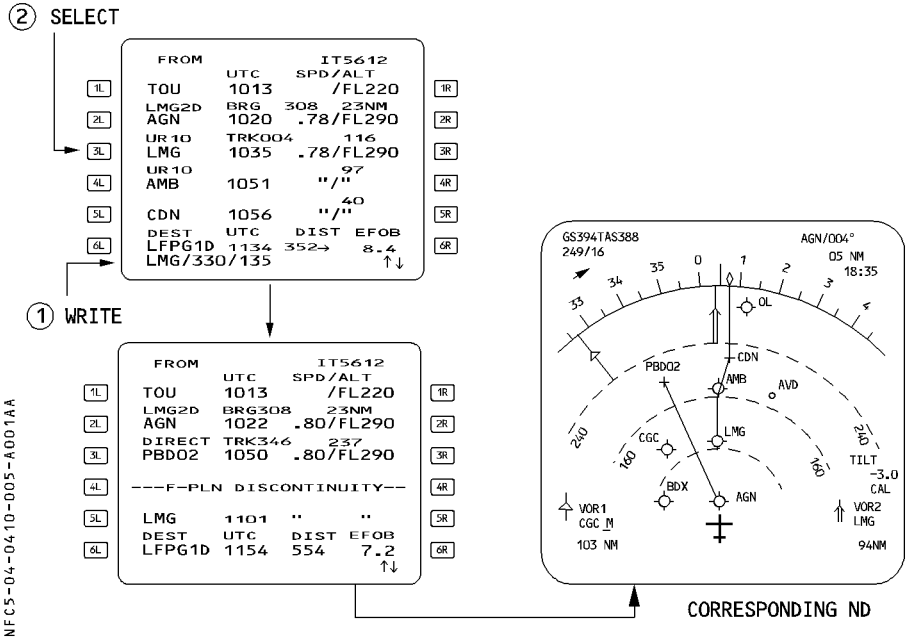
The pilot can identify a waypoint by :
- Its identifier (if it is in the navigation data base)
- A Latitude/Longitude (LL)
- A Place/Bearing/Distance (PBD)
- A Place-Bearing/Place-Bearing (PBX)

Note : If a slash or a dash is not entered properly, the Multifunction Control and Display Unit displays a "FORMAT ERROR" message.

When the Flight Management Guidance System receives a waypoint not in the data base, it identifies it as LLxx or PBD xx or PBX xx (xx is a two-digit number between 01 and 20) and stores it in the stored waypoints file of the data base.

Note : When NAV mode is engaged, the crew cannot modify the "TO" waypoint (active leg) using the waypoint insertion function. If the crew wants to modify it, it will use the DIR TO function.

WAYPOINT INSERTED DIRECTLY IN THE FLIGHT PLAN

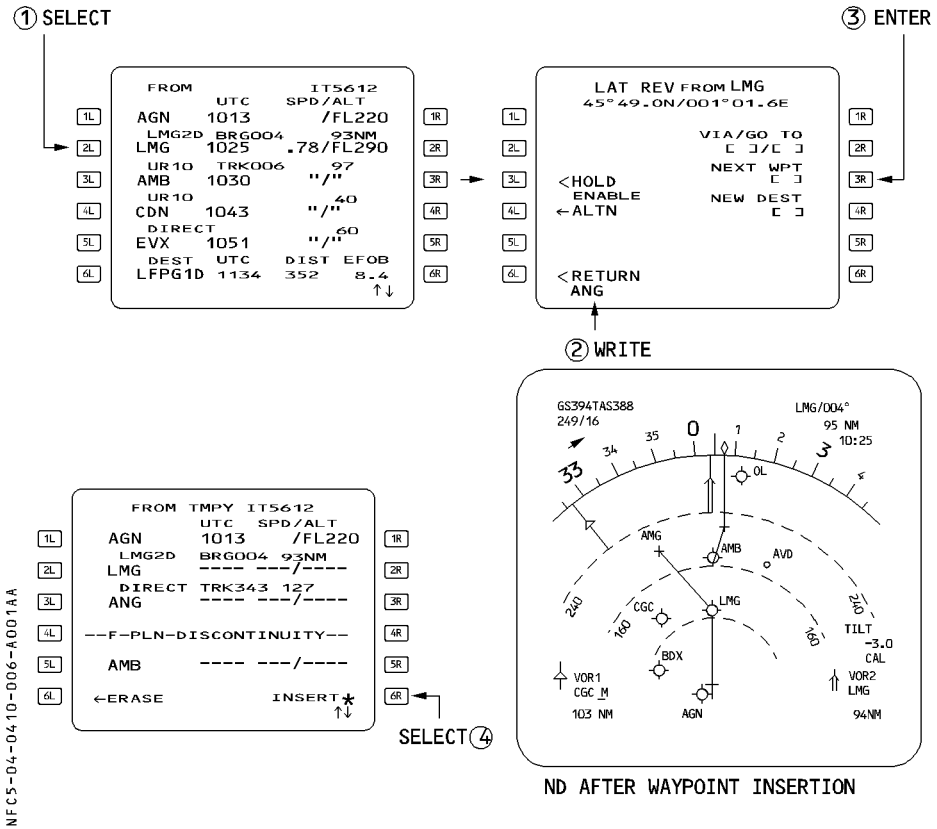


- **WRITE the waypoint identifier or LAT/LONG, Place/Bearing/Distance or Place-Bearing/Place-Bearing into the scratchpad. (Example : Place : LMG, Bearing: 330°, Distance : 135 NM)**

- **PRESS the appropriate key to enter the waypoint into the flight plan. The rule is that the new waypoint appears next to the pressed key, and the previous waypoint moves down the flight plan path.**

This operation creates a discontinuity between the new waypoint and the previous one. The new flight plan will have to be cleared of the discontinuity and some waypoints erased.

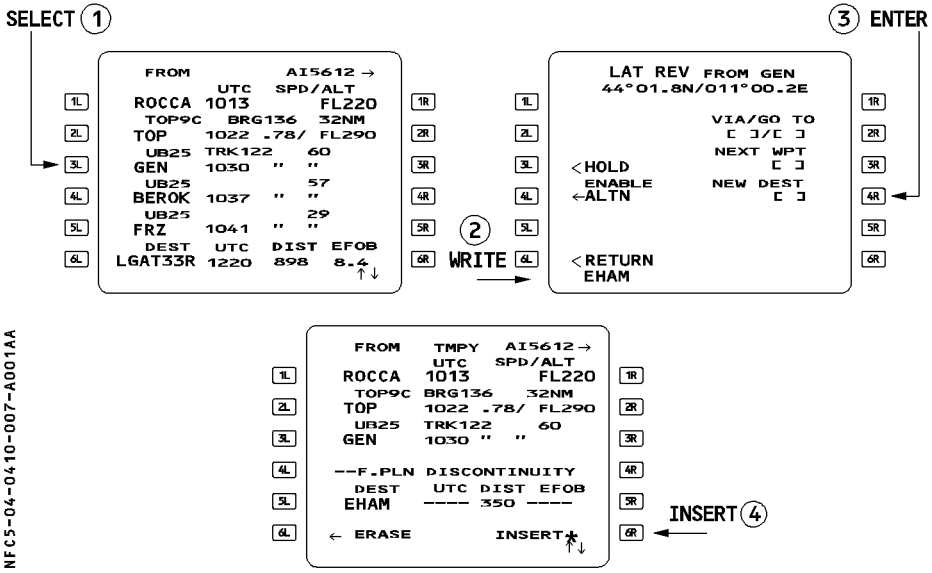
WAYPOINT INSERTED THROUGH THE USE OF "NEXT WAYPOINT"



- **SELECT the lateral revision (LAT REV) function at an appropriate waypoint.**
- **WRITE the waypoint identifier, or LAT/LONG, or Place/Bearing/Distance, or Place-Bearing / Place-Bearing into the scratchpad.**
- **ENTER it in the brackets under NEXT WPT (next waypoint).**
- **INSERT the temporary flight plan by depressing the [6R] key.**
- **CLEAR the F-PLN discontinuity as appropriate.**

INSERTING A NEW DESTINATION

The pilot may define a new destination and insert it through the lateral revision page. The pilot may then call up the new destination from any waypoint along the flight plan except the FROM waypoint, the destination, and the missed-approach waypoint. When the new destination has been inserted, a flight plan discontinuity appears between the revision waypoint and the new destination. All waypoints beyond the revision waypoint (including the previous destination and associated missed approach) are deleted.



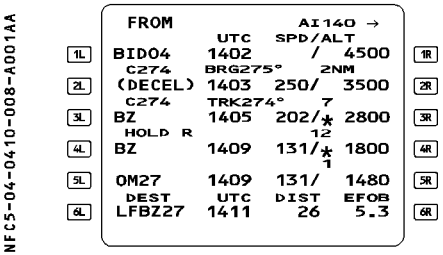
- **SELECT the lateral revision function at an appropriate waypoint.**
- **WRITE the new destination in the scratchpad.**
- **ENTER it in the brackets under NEW DEST**
- **INSERT the temporary flight plan [6R] key, and complete the flight plan to the new destination.**

HOLDING PATTERN

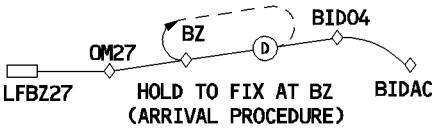
Holding pattern description, associated guidance and flight crew procedures are put together in this chapter.
The flight management and guidance computer (FMGC) has three types of holding pattern that the pilot can use in a flight plan.

HOLD TO FIX (HF)

The holding pattern is always part of an arrival or departure procedure. The aircraft flies it once and then exits the holding pattern automatically at the fix. The predicted speed in the holding pattern is the lowest of ICAO speed limit, max endurance speed, or any speed constraint.
Guidance to the fix in the holding pattern is similar to that on any leg of a flight plan. The HF patterns are part of the navigation database and cannot be created by the crew.

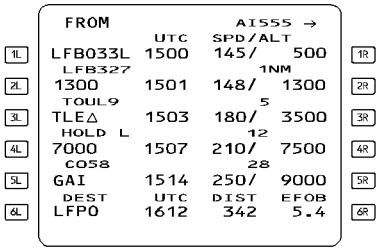


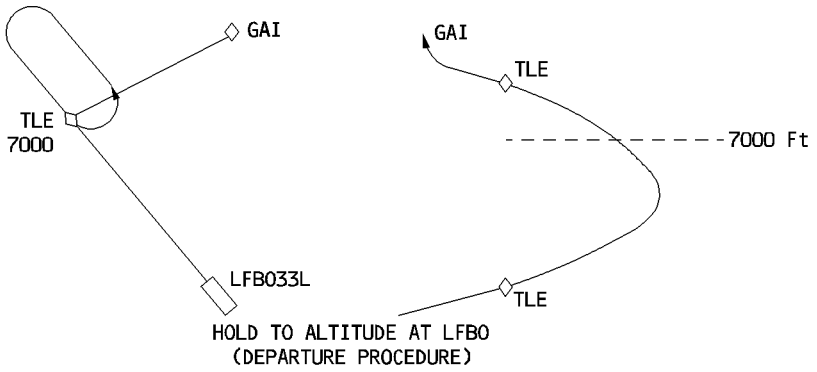
NFC5-04-0410-008-A001AA



HOLD TO ALTITUDE (HA)

The HAs are in the navigation database as part of arrival or departure procedures and cannot be created by the crew.
The aircraft flies the hold until it reaches the specified altitude. Then it exits the hold automatically at the fix.
The predicted speed for the holding pattern is the lowest of the ICAO speed limits, the max endurance speed or any speed constraint.
The size of the holding pattern is a function of the predicted speed.
Guidance in a hold to altitude (HA) is similar to that for any leg of a flight plan.





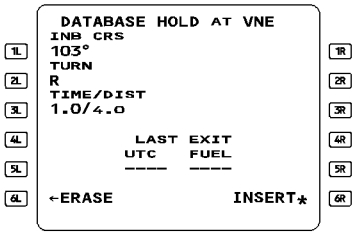
NFCS-04-0410-009-A001AA

HOLD WITH MANUAL TERMINATION (HM)

This type of holding pattern may be part of an arrival procedure, or the flight crew may enter it at present position or at any flight plan waypoint.
The pilot will use this type of holding pattern to comply with a defined procedure or a clearance limit or to meet an operational need (such as losing altitude, holding for weather improvement, or absorbing an ATC delay).
This type of holding pattern is exited under pilot decision and not automatically.
There are 3 types of HM, all are modifiable.

DATABASE HOLD

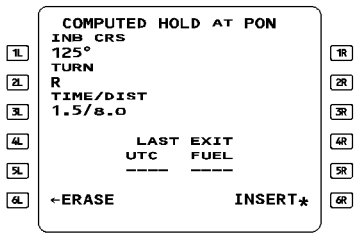
NFC5-04-0410-010-A001AA



If the holding pattern is part of the database, it is named DATABASE HOLD and all its associated data (inbound course, turn direction, time/distance) are defined in the data base. Flight crew can modify this data.

COMPUTED HOLD AT ...

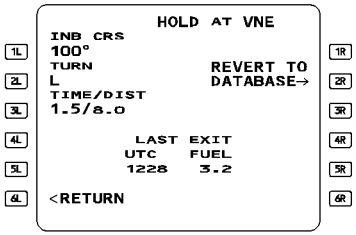
NFC5-04-0410-010-B001AA



If the holding pattern is not in the database, the FMGC designs a holding pattern and proposes it to the pilot. The associated data consists of default values that the pilot can modify.

HOLD AT ...

NFCS-04-0410-011-A001AA



If the pilot inserts into the active flight plan a holding pattern that is manually corrected from a hold defined by the FMGS, the screen displays a "HOLD AT ..." page. The field 2R displays REVERT TO DATABASE or REVERT TO COMPUTED to restore the database data if necessary.

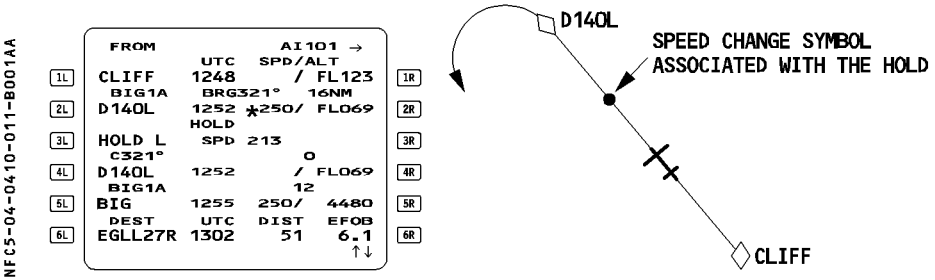
PREDICTIONS AND GUIDANCE ASSOCIATED WITH AN HM HOLDING PATTERN (HOLD WITH MANUAL TERMINATION)

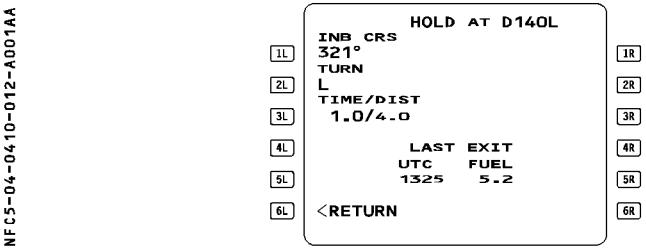
Before deceleration

Although the hold is inserted into the flight plan, the FMGS does not take it into account for predictions until the aircraft enters the hold.

However, if the hold is not deleted by the crew, the FMGS schedules a deceleration point and displays it on the ND.

NFCS-04-0410-011-B001AA





The FMGS predicts the estimated time and amount of fuel remaining at which the aircraft must exit holding so as to comply with fuel policy specified on the fuel prediction page. When the aircraft enters the holding pattern, the FMGS revises all predictions and assumes the aircraft to fly one turn of the holding pattern.
All predictions are revised for one more holding circuit at holding fix overfly.

Upon reaching the speed change pseudo waypoint

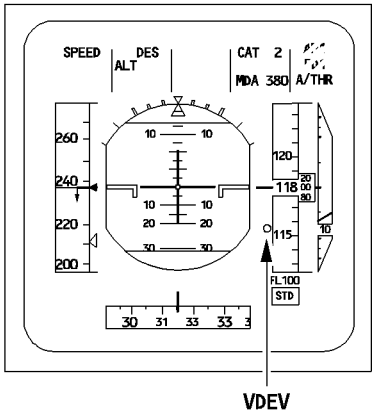
The FMGS either causes the aircraft to decelerate to the hold speed (if managed speed is active and NAV mode engaged), or displays "SET HOLD SPD" (set hold speed) on the MCDU and primary flight display if the flight crew had selected a speed target.

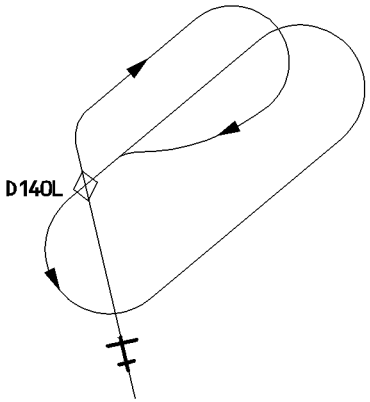
R The default hold speed is the lowest of :
- Maximum endurance speed
- ICAO limit holding speed
- Speed constraint (if any).

R When no specific speed limit applies, the default hold speed is approximately equal to :
R - Green Dot speed on the A318, A319, A320 (CFM) and A321
R - Green Dot + 20 kts on the A320 (IAE).

The flight plan predictions for time and fuel do not yet consider that the hold will be flown, however, the navigation display shows the hold entry and holding pattern trajectory.

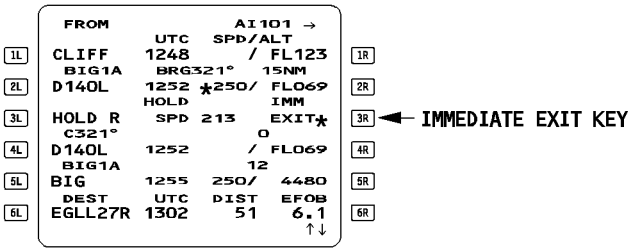
NFC5-04-0410-013-A001AA





Deceleration receives priority, so that when the aircraft is in descent with the descent mode engaged, it will deviate above the descent path to decelerate. (VDEV becomes positive on the progress page).
The flight plan page displays an immediate exit prompt.
If the pilot presses the key next to "IMM EXIT" before arriving at the holding fix, the aircraft will not enter the holding pattern, but will resume its phase-related managed-speed profile.

NFC5-04-0410-013-B001AA



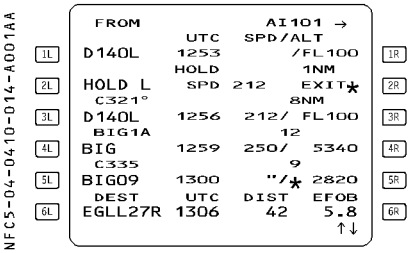
After reaching the hold entry fix

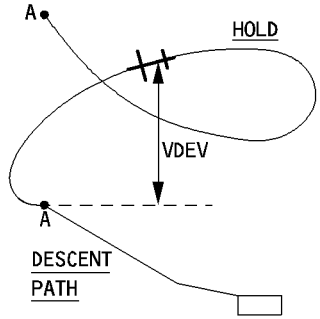
The aircraft enters the hold. The system assumes that the aircraft will fly one turn of the holding pattern and revises the predictions accordingly.
When the holding pattern was defined by a leg time (and not a leg distance), the system revises the size of the hold as a function of the target speed.

- If managed speed is active, the system uses the predicted holding speed to calculate the size of the holding pattern.
- If the selected speed is active, the system uses the target speed the pilot selects at the entry fix sequencing to calculate the size of the holding pattern.

– The VDEV displayed on the primary flight display and the PROG page while the aircraft is flying in the HM (hold pattern with manual termination) is the difference between its current altitude and the altitude at which it should be when it reaches the hold exit fix in order to be positioned properly on the descent path.

R



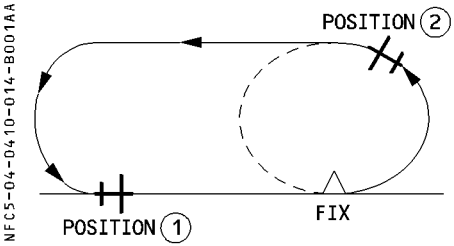


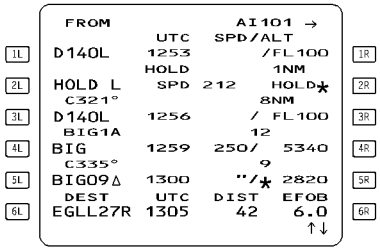
With IMM EXIT pressed (aircraft in the holding pattern)

The predictions and guidance assume that the aircraft is returning immediately to the hold fix.

Sequencing the hold fix, the aircraft exits the holding pattern and resumes its navigation.

R The flight plan page displays "RESUME HOLD*" instead of "IMM EXIT*".





HOLD EXIT PROCEDURE

R **– Position 1 : If "IMM EXIT" pressed, aircraft will exit at next fix overfly.**

R **– Position 2 : If "IMM EXIT" pressed, aircraft will make an immediate turn to the fix**
R **where hold will be exited.**

If managed speed is active, the computer sets the target speed to the applicable speed of the current phase (for example, speed constraint, ECON speed, or speed limit).

The computer then bases its predictions on the assumption that the flight will continue on the descent path if the aircraft is in a descent.

If DES mode is engaged, the following rules apply :

- The holding pattern is never included in the descent path computation.
- The pilot cannot enter altitude and speed constraints at the hold exit fix. (This is only allowed at the hold entry fix).
- The vertical guidance in the HM during the descent phase calls for a constant – 1000 feet per minute, but the computer considers altitude constraints that will take effect farther down the flight path as it calculates vertical guidance and predictions. The
R system will not allow the aircraft to descent below the next altitude constraint, neither
R the FCU selected altitude. If the aircraft reaches the next altitude constraint, it will level off and the altitude constraint mode will engage.

With RESUME HOLD pressed

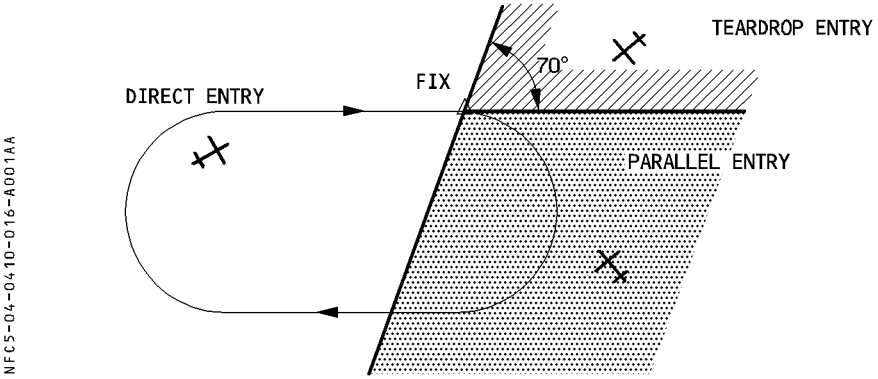
If the pilot presses the key next to "RESUME HOLD", the aircraft remains in the holding pattern, and the display again shows "IMM EXIT".

After that, each time the aircraft flies over the holding fix, the system updates the predictions for one more holding circuit.

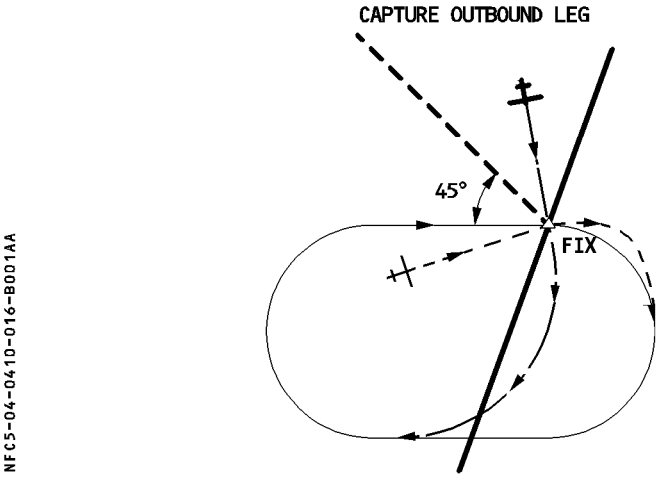
HOLDING PATTERN ENTRIES

The FMGS offers three types of entry into holding patterns :

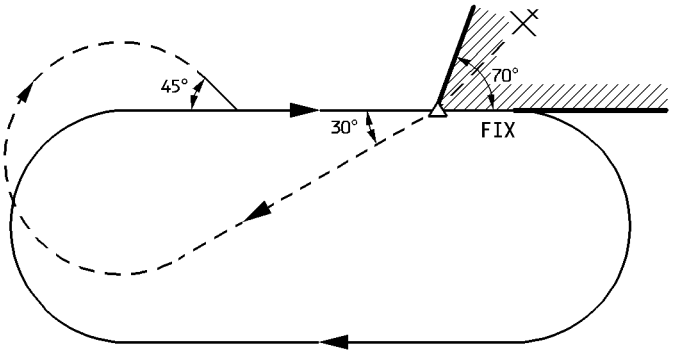
1. Direct entry
2. Teardrop entry
3. Parallel entry



1. The direct entry

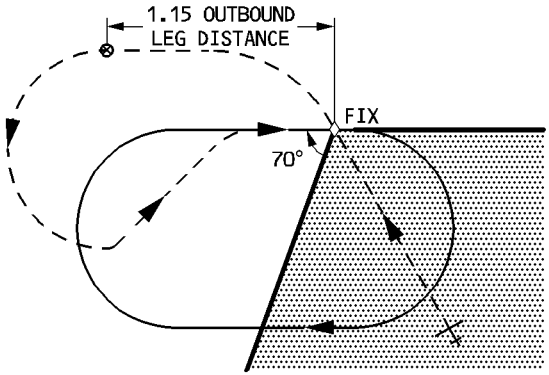


2. The teardrop entry



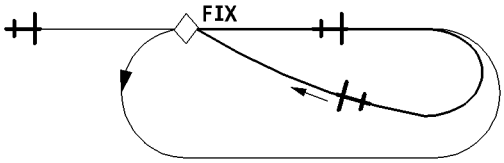
NFCS-04-0410-017-A001AA

3. The parallel entry



NFCS-04-0410-017-B001AA

Note : If the leg the aircraft is flying toward the holding fix is on a "limit" between a teardrop entry and a parallel entry, the FMGC may compute and display either of the two entries. The pilot should keep this in mind and not assume that the FMGC is malfunctioning.
If the flight plan leg toward the hold entry fix is on a course that is the reciprocal of the inbound course of the holding pattern, the aircraft will fly a parallel entry.

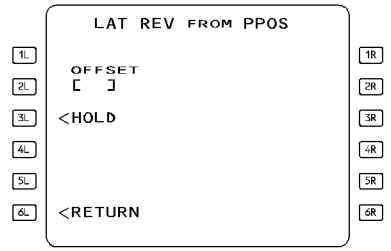


NFCS-04-0410-017-C001AA

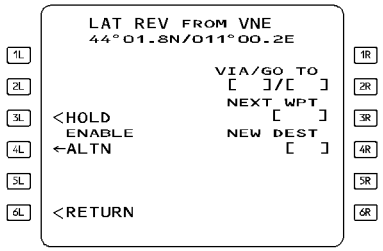
PROCEDURE TO INSERT A HOLD (HOLD WITH MANUAL TERMINATION)

The HOLD prompt allows the pilot to enter a holding patten with manual termination (HM) at the revised waypoint or at present position.
The pilot accesses the HOLD page from a lateral revision at the present position (PPOS) or at a waypoint. The MCDU displays HOLD-associated data : inbound course (INB CRS), TURN direction, TIME/DISTANCE and LAST EXIT time, and fuel to reach the alternate with the required fuel reserve.

NFC5-04-0410-018-A001AA



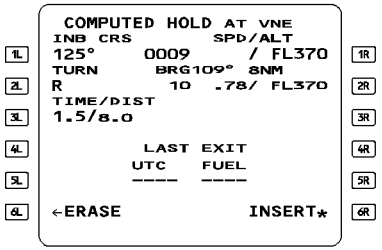
LAT REV AT PRESENT POSITION



LAT REV AT A WPT

- **SELECT lateral revision at present position (PPOS) or at applicable waypoint.**
- **PRESS HOLD prompt, [3L] key.**
- **CHECK and (if necessary) MODIFY the HOLD data.**
- **CHECK the temporary flight plan and INSERT it, if appropriate.**

NFC5-04-0410-018-B001AA



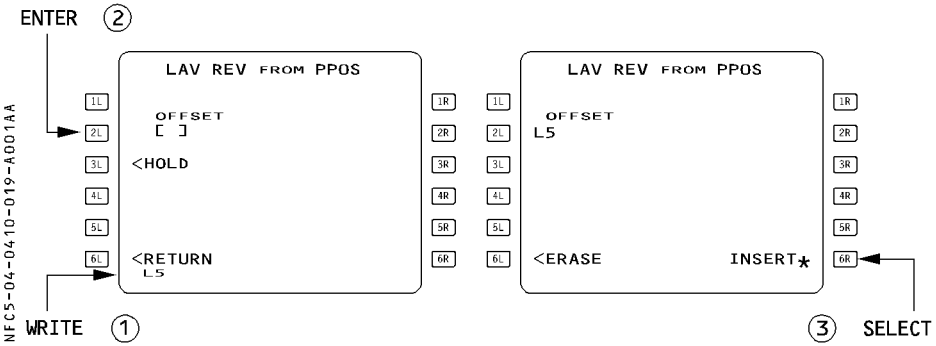
PROCEDURE TO DELETE A HOLD (HOLD WITH MANUAL TERMINATION)

- **CLEAR the HOLD directly in the flight plan as it can be done for a normal waypoint.**

OFFSET

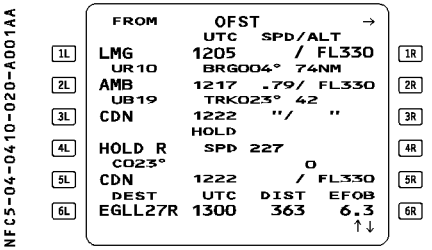
Offset allows the pilot to define a lateral offset to the left or right of the active flight plan. Once inserted, the offset applies from present position (PPOS) all along the flight plan to the first waypoint (WPT) at which a holding pattern is defined, or to the last waypoint before the runway.
In most cases, the pilot will use it en route because of an ATC clearance or to avoid bad weather expected along the flight-plan route.
Accessed from lateral revision (LAT REV) at the present position page, an offset may be defined between 1 and 50 nautical miles in one-nautical-mile steps.
After inserting the offset in the flight plan, the flight plan page shows OFST in its title, and the navigation display shows the offset flight plan in a solid green line and the original flight plan in a dashed green line.
The offset is cleared :
Automatically (holding pattern, approach)
Manually with the clear (CLR) key.

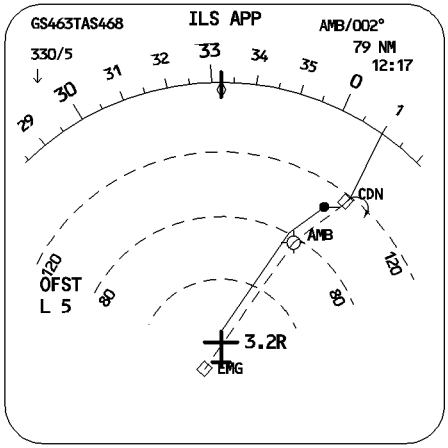
Note : If the pilot enters an OFFSET when the aircraft is too close to the TO waypoint, the FMGS may refuse to accept it, in which case the MCDU displays the message "ENTRY OUT OF RANGE".



INSERTING AN OFFSET

- **SELECT LAT REV at FROM waypoint.**
- **WRITE the required offset value and direction (for example, L5 or 5L).**
- **PRESS [2L] to enter the offset into the OFFSET field.**
- **PRESS [6R] to activate the OFFSET.**

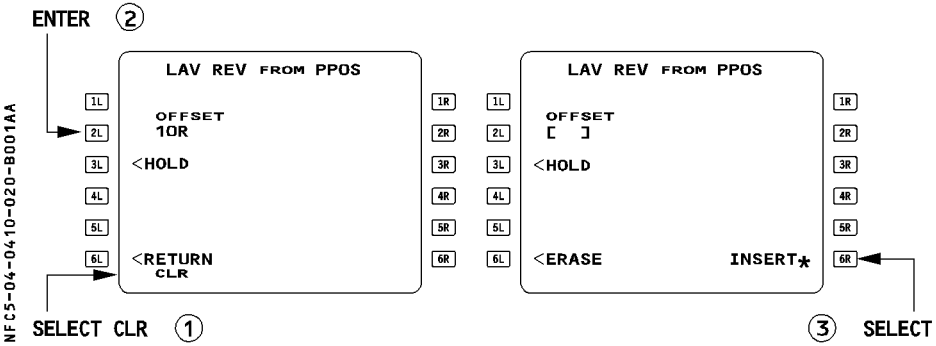




MANUAL CANCELLATION OF OFFSET

There are two normal methods for cancelling an offset :

- **1. SELECT DIR TO a waypoint (the next waypoint, for example)**
- **2. SELECT a Lateral Revision (LAT REV) at FROM WPT**
  - **– CLEAR THE OFFSET field.**
  - **– PRESS [6R] to activate the temporary flight plan (cancelling OFFSET).**



ALTERNATE FUNCTION

The ALTERNATE FUNCTION performs two actions :
- It reviews and defines alternate airports and inserts them into the flight plan.
- It allows a diversion to be activated through the ENABLE ALTN command.

REVIEW AND SELECTION OF ALTERNATE AIRPORT

Several alternate airfields may be stored in the data base and assigned to a destination. When the pilot selects a company route (CO RTE) (or a city pair), the computer strings the preferred alternate into the active flight plan.
The pilot may review the alternate airports on the ALTN page, and if the one selected is not suitable because of weather or fuel considerations, another alternate may be strung into the active flight plan.

R The pilot may define an additional alternate airport into the list, if necessary.
The ALTERNATE page shows the track and distance (airway or direct) between the destination and the alternate, as well as fuel management data (EXTRA fuel, assuming the associated airfield is the alternate airport). This data will help the pilot change the preferred alternate, if necessary.

R Access the ALTERNATE page through the ALTN prompt on LAT REV at destination.

R Alternate airfields are attached to the destination.

ENTERING NEW ALTERNATE INTO THE F-PLN

If the preferred alternate is not suitable, proceed as follows :

– SELECT the F-PLN key on MCDU

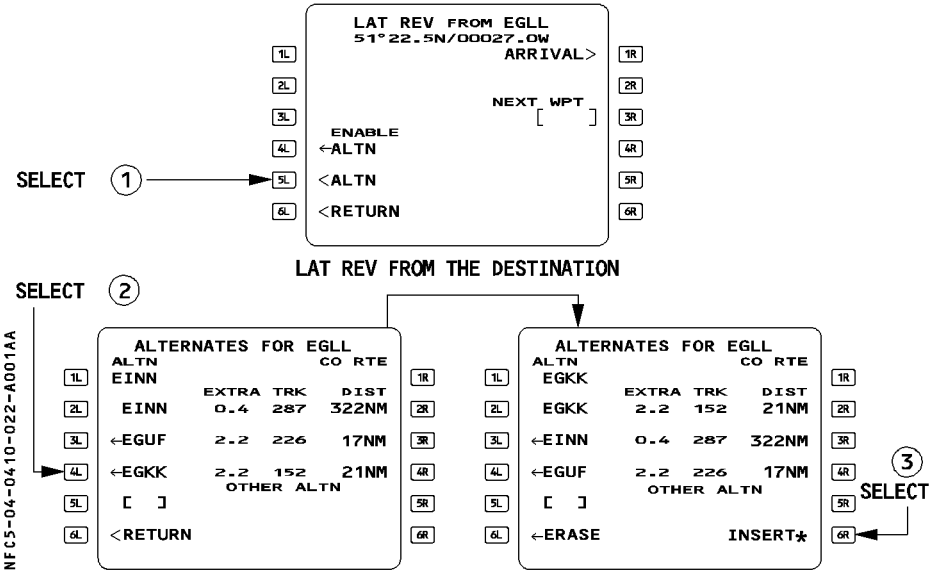
R **– SELECT LAT REV at destination.**

– SELECT ALTN [5L] key.

– SELECT an AIRFIELD IDENTIFIER

– INSERT the temporary flight plan

Note : If weather and destination airfield conditions allow it, you may select "NO ALTN", fuel predictions will be computed without alternate fuel.



SELECTION OF OTHER ALTERNATE

Fuel management information to another alternate airfield may be obtained by selecting the OTHER ALTN field.

R **— SELECT LAT REV at destination.**

— SELECT ALTN [5L] key.

— ENTER the airfield ident into the brackets.
- If the airfield is not in the data base, the NEW RUNWAY page appears automatically.
- If the airfield is in the data base and there is a company route (CO RTE) to it, the ROUTE SELECTION page appears automatically.

— SELECT the route as appropriate or RETURN to the ALTN page.

— ENTER the distance into the brackets (if required). XTRA fuel and track (TRK) will appear.

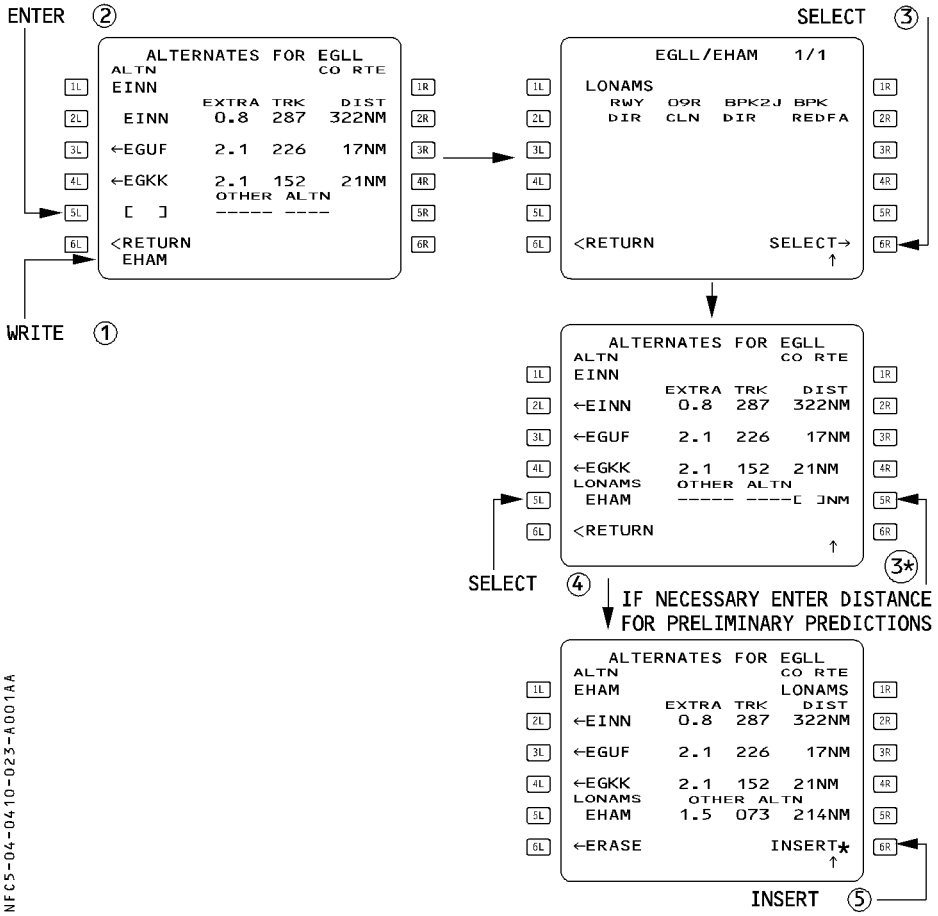
— SELECT the other alternate (OTHER ALTN) as a primary alternate if it is convenient. (EXTRA fuel and DIST revert to AIRWAY distance).

— INSERT it if you want to have it as a primary alternate.

Note : – *The pilot can always overwrite the "OTHER ALTN". The new "OTHER ALTN" then replaces the previous one, which is lost.*

– *The pilot can select OTHER ALTN as a primary alternate (active flight plan) to replace any alternate on the initial list.*

– *If the pilot selects the other alternate as a primary alternate and overwrite the OTHER ALTN field by entering a new airport, the first one will remain a primary alternate and the system will memorize a second OTHER ALTN.*



NFC5-04-0410-023-A001AA

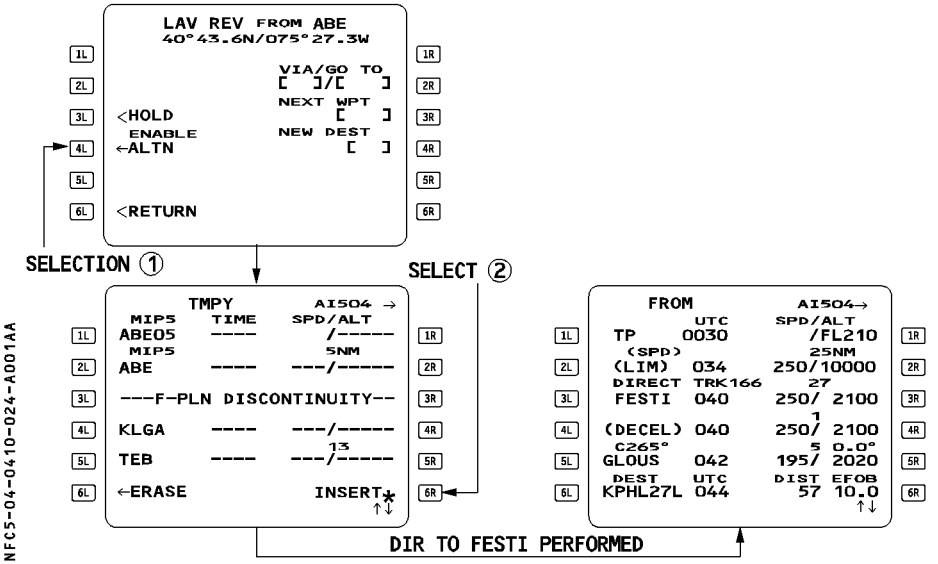
PREDICTED DATA FOR ALTERNATE

Data predictions are based on :

* Aircraft weight being equal to landing weight at primary destination
* Flight at flight level 220 if the airway distance is less than 200 NM, otherwise at flight level 310
* Cost index 0
* Constant wind
* Constant delta ISA (equal to delta ISA at primary destination)
* Airway distance for a company route, otherwise direct distance. (Manually entered distance for OTHER ALTN, used for preliminary predictions)

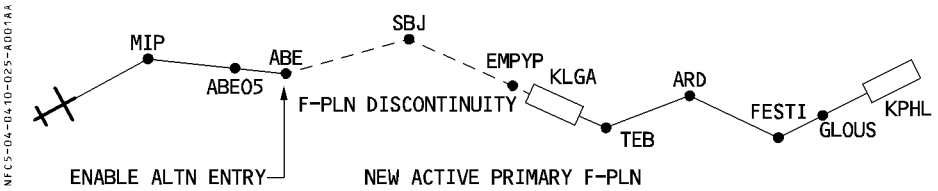
ENABLE ALTN

This allows the pilot to initiate a diversion by entering the alternate flight plan just after the revision waypoint (with a discontinuity).
The pilot may have to adjust the resulting flight plan (use "direct to", or add or suppress waypoints), depending upon the circumstances.



TO ACTIVATE THE PRIMARY ALTN :

- **SELECT a LAT REV at the "TO" waypoint (or at another suitable waypoint)**
- **PRESS the ENABLE ALTN key**
- **INSERT the temporary flight plan**
- **ENTER an appropriate waypoint in DIRECT TO and adjust the flight plan.**
- **ADJUST the cost index on the PERF page and the defaulted cruise flight level (CRZ FL) on the PROG page, as required.**



When ENABLE ALT is pressed at ABE, a flight plan discontinuity is created from ABE down to destination and the alternate route is linked to the active flight plan.

DIR KEY (DIRECT-TO FUNCTION)

The pilot uses the "Direct To" function to define a direct leg from the present position to any waypoint on the active flight plan or to any waypoint.

R The designated waypoint may be entered by its identifier (if it is stored in the database) or by a latitude/longitude, place/bearing/distance, or a place-bearing/place-bearing. When the pilot uses DIR TO, the present position (PPOS) becomes the "FROM" waypoint and the

R active flight plan shows it as T-P (turn point). The pilot must not use DIR TO on the ground.

Note : If the autopilot or flight director is in the heading/track or localizer mode, the "DIR TO" function engages NAV mode.

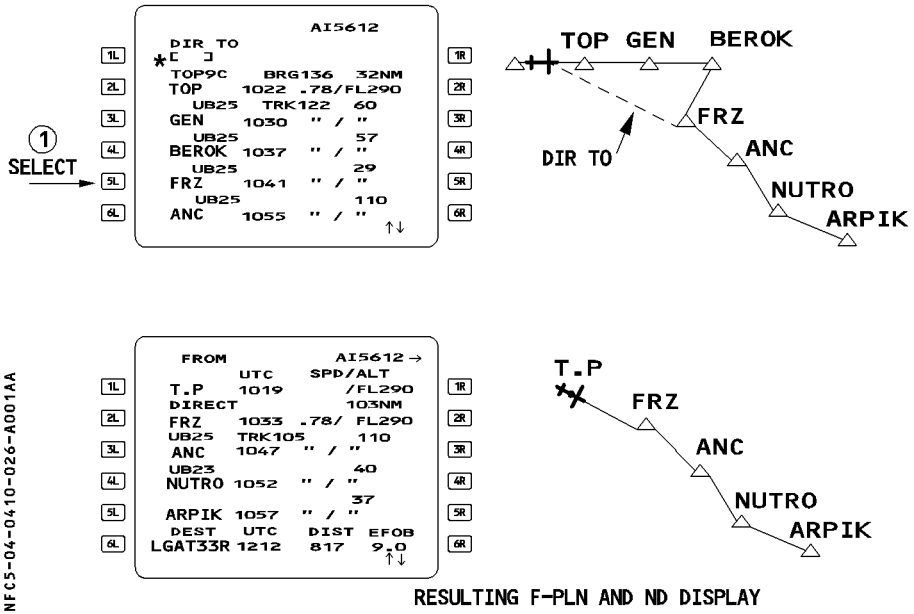
PROCEDURE

Case 1. The "TO" waypoint is in the flight plan

Example : DIR TO FRZ

– PRESS the DIR key on the MCDU.

– PRESS the line select key next to "FRZ"



RESULTING F-PLN AND ND DISPLAY

Note : The system does not create a temporary flight plan when a DIR TO is used, the flight plan modification being immediately inserted.

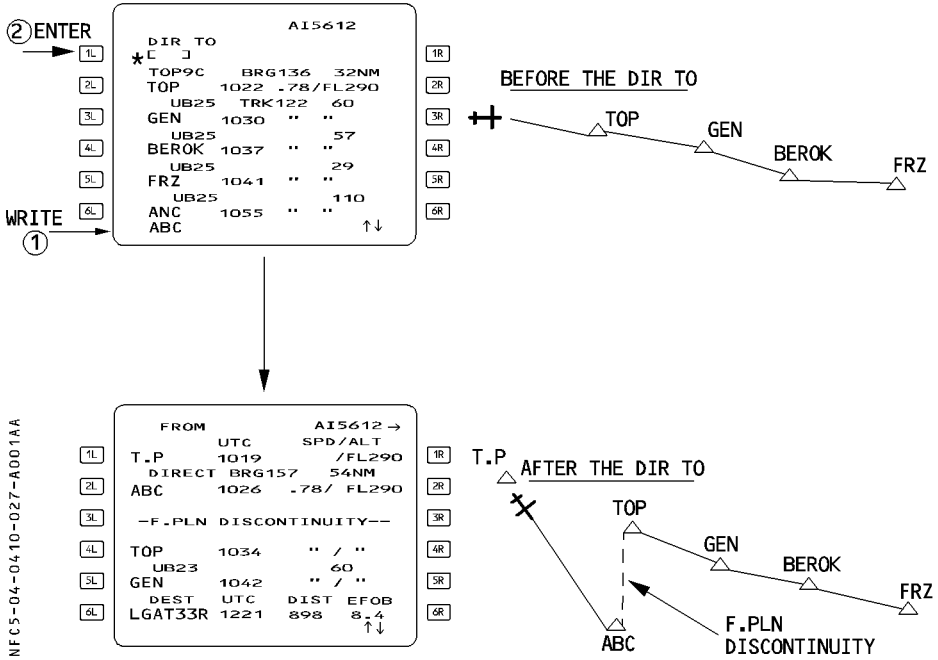
Case 2. The "TO" waypoint does not belong to the flight plan

Example: Direct to ABC (ABC being an ident, LL or PBD or PB/PB)

– PRESS the DIR key.

– WRITE "ABC" into the scratchpad.

– PRESS [1L] to enter "ABC" in the "DIR TO" field.

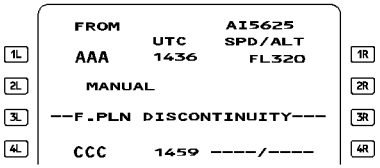


Clear the discontinuity and the waypoints that are not included in the new flight plan.

PARTICULAR CASES FOR USE OF DIR TO

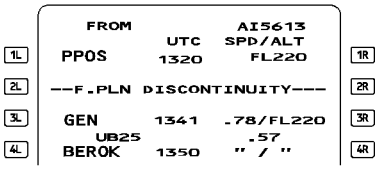
– If the pilot is flying a manual leg (part of a SID or STAR), the flight plan page dislays "F-PLN DISCONTINUITY", preceded by "MANUAL" (see below).
These legs are specific heading or track legs flown with no defined end waypoint.

NFCS-04-0410-028-A001AA



– When the pilot encounters a flight plan discontinuity or if a major reset occurs, the flight plan page displays "PPOS – F-PLAN DISCONTINUITY", and the pilot looses managed guidance in both the lateral and the vertical plans.
The autopilot or flight director reverts to the basic HDG V/S (or TRK FPA) modes. Predictions remain available and are based on the assumption that the aircraft will fly a direct leg from its present position to the next waypoint.

NFCS-04-0410-028-B001AA



– **In both of these cases, the only way to get back to a standard flight plan is to perform a "DIR TO" to a designated waypoint.**
– Following a DIR TO, the message "MAP PARTLY DISPLAYED" may appear on NDs if the new flight plan includes a very long leg. Please refer to 1.31.45. for description. When this message comes up, enter an intermediate waypoint to shorten the leg.

R *Note : During cruise, the DIR TO function is not available as long as uplink wind data,*
R *received through ACARS (◁), is not inserted or cancelled on the CRUISE WIND*
R *page.*

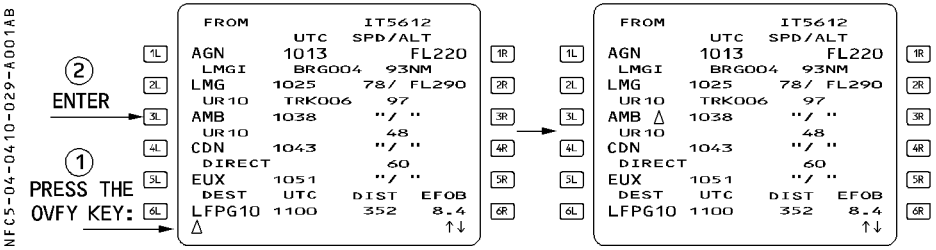
OVFY (OVERFLY) KEY

The overfly key programs the Flight Management Guidance Computer to fly over a specific waypoint or navaid. To use it :

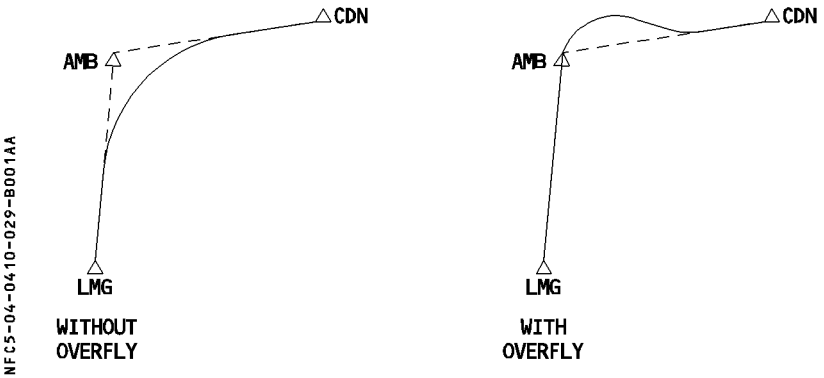
- **PRESS the "OVFY" key.**
  A "△" appears in the scratchpad.

- **INSERT it by pressing the key adjacent to the waypoint to be overflown. [3L] in this example.**

R



The pilot cannot cancel the overfly program. If you do not want to fly over the point you have entered, use DIR TO (direct to) the next waypoint or the heading mode, whichever is more suitable.



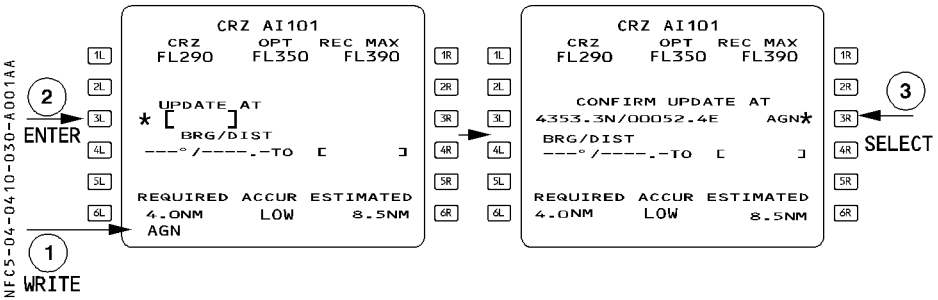
The overfly function allows you to fly over a specific waypoint, and then returns the aircraft to the great circle track.

"UPDATE AT"

The pilot uses "UPDATE AT" on the progress page to manually change the position the FMGC has computed (FM position and bias).

Use this function with extreme caution : it is apt to be inaccurate because it relies on the pilot's estimating when a designated position has been reached.

R



- **WRITE the ident for the navaid (or waypoint, or airport) or the coordinates or the PBD or PBX at which update is intended.**

- **PRESS [3L] to enter the ident in the "UPDATE AT" field. The coordinates of the point, along with its identifier (or "ENTRY" if the identifier is not in the data base), appear in that field.**

- **PRESS [3R] to activate the update when you estimate that you are at the position.**

  Note : The system reinitializes the Estimated Position Error computation when a position update is performed. This may lead to the appearance of a "NAV ACCUR DOWNGRAD" or "NAV ACCUR UPGRAD" message.

CAUTION

If the "UPDATE AT" does not take effect properly, it corrupts the FM position.

- In an area with good radio navaid coverage :
  - If the update error is small, subsequent radio position updating will correct the FM position.
  - If the update error is large, the system will reject any radio updating because its internal "reasonableness test" will reject the various navaids. Thus the FM position will only be the MIX IRS position corrected by the position bias determined at the time of the update, and the error will be maintained.
- In an area without proper navaid coverage, radio position updating is not available and the FM position, if incorrect, will remain incorrect until a new manual update is performed.
- Therefore, the pilot should use "UPDATE AT" only in case of a major position problem such as :
  - on the ground, no flight plan appears on the navigation display and ARC/ROSE NAV mode is selected .
  - A "CHECK A/C POSITION" message appears and the position monitor page indicates an obvious position mismatch.

◁ When the GPS PRIMARY is operative, the FM position will always converge towards the GPS position at a rate depending on the aircraft altitude. Therefore when GPS PRIMARY is operative, an "update at" that is innacurate will have a temporary effect on the FM position.

GENERAL

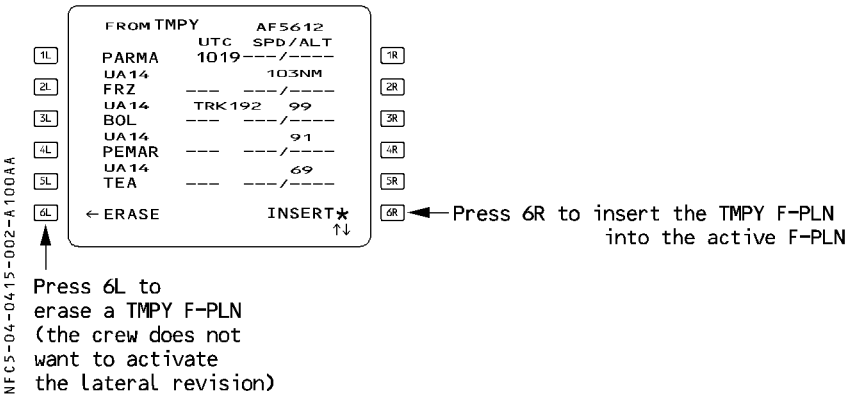
The lateral revision function allows the pilot to create or modify the following parts of the flight plan :

- Airway
- Waypoint
- New destination
- Holding pattern
- Offset
- Alternate
- Fix information
  Each time the pilot activates one of the above-listed revisions, he accesses a temporary flight plan that enables the modification to be checked before inserting it in the active flight plan. The crew selects these functions by pressing the left keys on F-PLN A or B.
- Direct to and overfly functions are accessed via the MCDU keys. No temporary flight plan is created with these functions.
- "Update at" capability is a specific function that manually updates the FM position. It does not use a temporary flight plan, but the pilot must confirm its insertion before it is activated.

TEMPORARY F-PLN (TMPY)

When a pilot makes a lateral revision to the F-PLN, the FMGS creates a temporary flight plan. This is a copy of the active F-PLN, but is corrected by the lateral revision in progress. The aircraft continues to follow the active F-PLN, until the temporary revision is inserted. The revision appears in yellow font on both MCDUs and NDs.

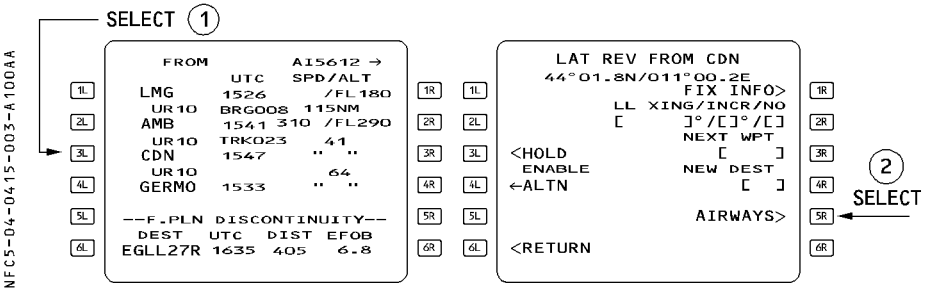
- Lateral and vertical revisions cannot be made to a temporary F-PLN.
- Only one temporary F-PLN may be accessed at a time.
- The "DIRECT TO" function, when used, erases a temporary F-PLN.
- When a DIR TO is in process, a temporary revision cannot be displayed on the other MCDU.
- A TMPY F-PLN changes the title of the flight plan pages. (TMPY appears in all titles).
- No predictions are computed for a temporary flight plan (dashes are displayed).



Temporary data is displayed in yellow (ND and MCDU). Once inserted, it becomes active and is displayed in green.

INSERTING AN AIRWAY WITH "VIA"

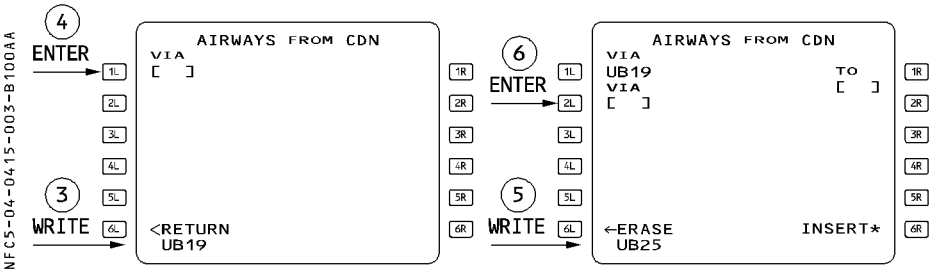
In the active flight plan, the pilot can insert up to 5 successive airway segments, going from a revised waypoint or ending at a given waypoint of the flight plan.



- **SELECT the revised waypoint (here CDN).**
- **PRESS [5R] to select the airways function.**

THE PILOT WISHES TO INSERT SUCCESSIVE AIRWAY SEGMENTS FROM A WAYPOINT

e.g. from CDN - Airways UB19 – Airways UB25 – Ending point AAA.

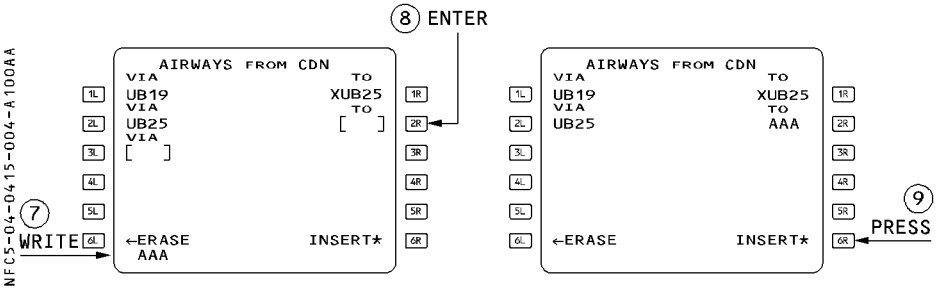


- **WRITE the first airway in the scratchpad (here UB19).**
- **PRESS [1L] to insert it into the VIA field.**
- **WRITE the second airway in the scratchpad (here UB25).**
- **PRESS [2L] to insert it into the VIA field.**

The system automatically determines the first downpath intersection point between the 2 airways.

- If the airways have a common waypoint, the system selects it as the ending point of the first VIA.
- If they have no common waypoint, but have a single intersection, the system creates this intersection as an FM-computed point and displays X followed by the airway ident (here XUB25).
- If they have no common waypoint or intersection, the system displays NO INTERSECTION FOUND in the scratchpad.

Once the pilot has entered the required airways (up to 5), he must enter the ending point of the last selected airways :

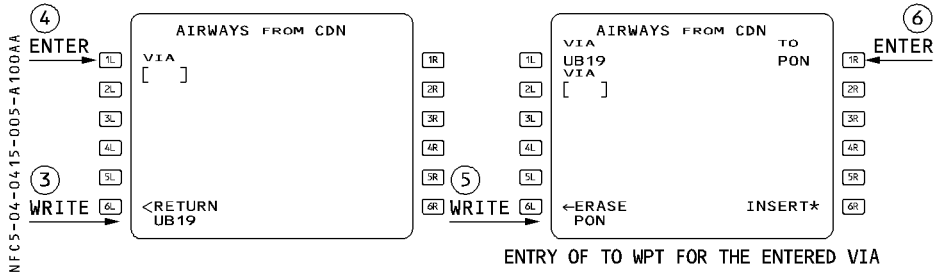


– WRITE the ending waypoint in the scratchpad (here AAA).

– PRESS [2R] to insert the ending waypoint into the TO field.

Note : If two waypoints with the same ident belong to the same airway, the DUPLICATE NAMES page will not be called up, and the system selects the first one in the database.

THE PILOT WISHES TO INSERT ONE AIRWAY SEGMENT TO AN ENDING WAYPOINT



ENTRY OF TO WPT FOR THE ENTERED VIA

– WRITE the airway ident in the scratchpad (here UB19).

– PRESS [1L] to insert it into the VIA field.

– WRITE the ending waypoint in the scratchpad (here PON).

– PRESS [1R] to insert it into the TO field.

Note : – If the revise waypoint, or the ending waypoint, does not belong to the entered airway, the system displays AWY/WPT MISMATCH in the scratchpad.
– If two waypoints with the same ident belong to the same airway, the DUPLICATE NAMES page will not be called up and the system selects the first one in the database.

FLIGHT PLAN INSERTION

The flight crew either inserts the flight plan directly from the AIRWAYS page, or from the TMPY F-PLN page. In both cases :

– PRESS [6R] to insert the temporary flight plan. Clear flight plan discontinuity, as needed.

INSERTING A WAYPOINT

Waypoints can be inserted in two ways :
- Directly into the flight plan. All modifications go directly into the active flight plan. No temporary flight plan is created.
- By means of a lateral revision at the "NEXT WAYPOINT", a process that creates a temporary flight plan.

The second method enables the temporary flight plan to be checked before it is inserted.

WAYPOINT IDENTIFICATION

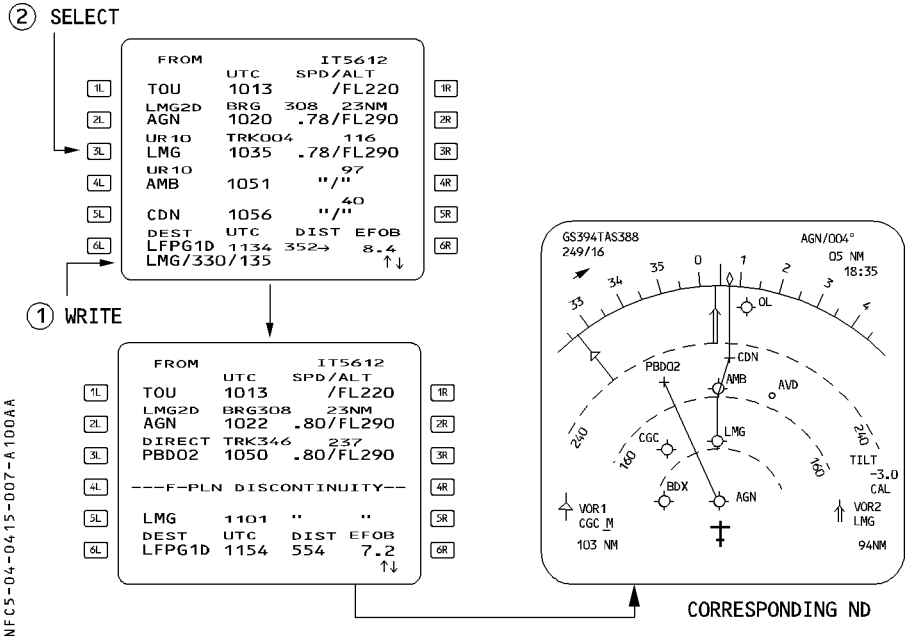
The pilot can identify a waypoint by :
- Its identifier (if it is in the navigation database).
- A Latitude/Longitude (LL).
- A Place/Bearing/Distance (PBD). The waypoint is defined by its bearing and distance from a place.
- A Place-Bearing/Place-Bearing (PBX). The waypoint is defined by the interception of 2 radials from 2 places.
- A Place/Distance (PD). The waypoint is defined by a distance from a place, along the F-PLN.

Note : If a slash or a dash is not entered properly, the MCDU displays a "FORMAT ERROR" message.

When the Flight Management Guidance System receives a waypoint that is not in the database, it identifies it as LLxx or PBD xx or PBX xx or PD xx (xx is a two-digit number between 01 and 20) and stores it in the stored waypoints file of the database.

Note : When NAV mode is engaged, the crew cannot modify the "TO" waypoint (active leg) using the waypoint insertion function. If the crew wants to modify it, the DIR TO function will be used.

WAYPOINT INSERTED DIRECTLY IN THE FLIGHT PLAN



NFC5-04-0415-007-A100AA

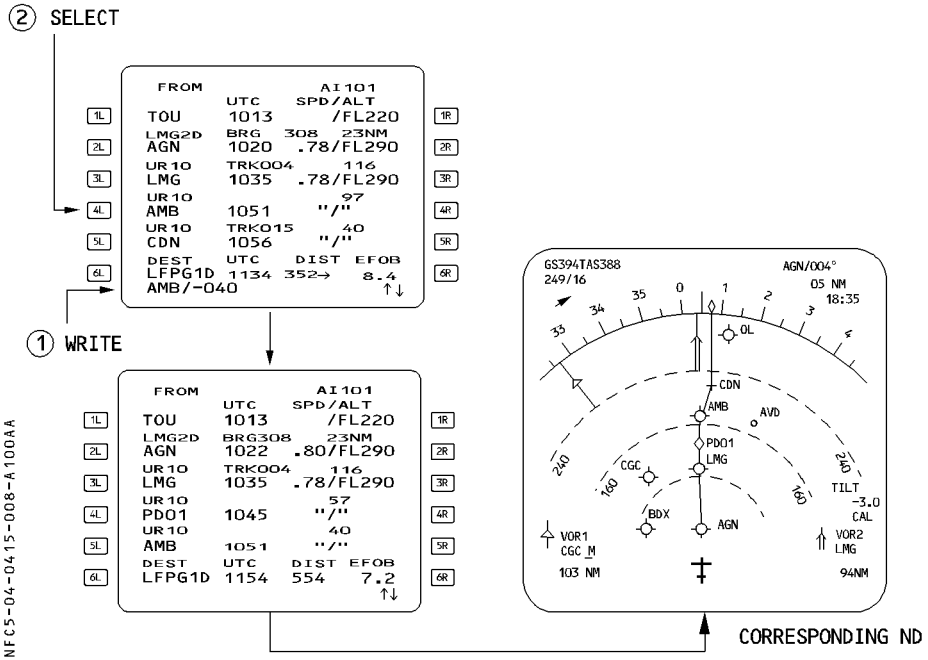
– **WRITE the waypoint identifier or LAT/LONG, Place/Bearing/Distance or Place-Bearing/Place-Bearing into the scratchpad. (Example : Place : LMG, Bearing: 330°, Distance : 135 NM).**

– **PRESS the appropriate key to enter the waypoint into the flight plan. The rule is that the new waypoint appears next to the pressed key, and the previous waypoint moves down the flight plan path.**

This operation creates a discontinuity between the new waypoint and the previous one. The new flight plan will have to be cleared of the discontinuity and some waypoints erased.

ALONG TRACK WAYPOINT INSERTION

On the F-PLN or STEP ALTS page, the pilot can enter an along track waypoint, defined as a place/distance waypoint.



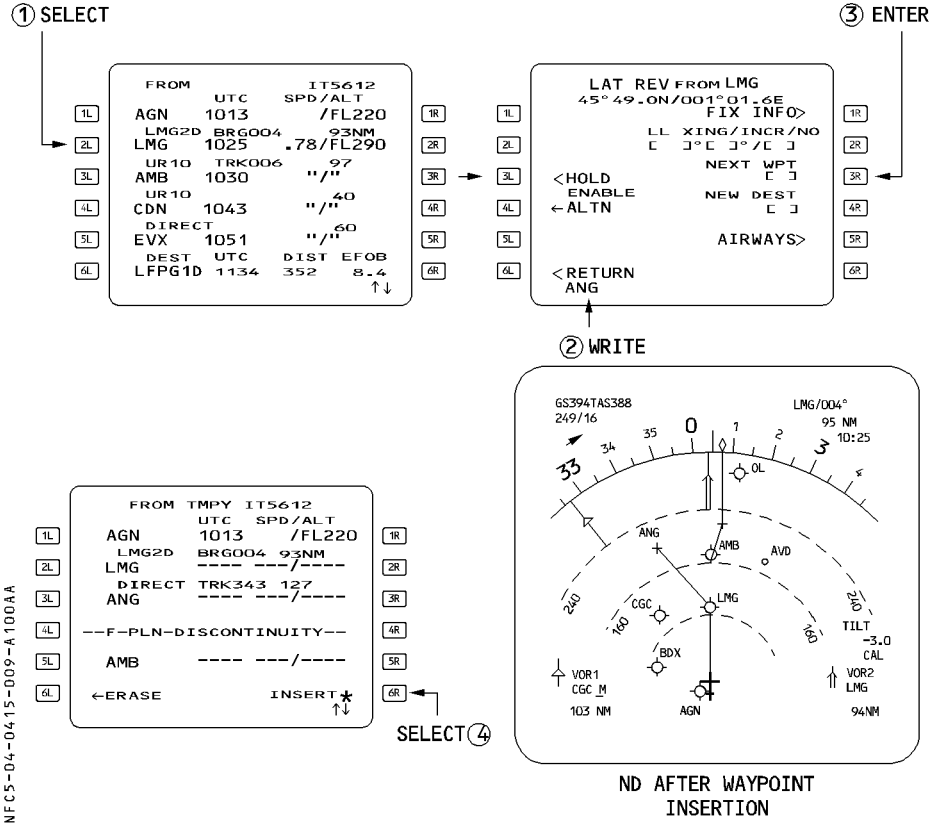
– **WRITE the waypoint identifier and distance from this place.**
According to the sign of the distance, the crew may define an along track waypoint before or after the revised place. (Example : AMB/-040).

– **PRESS the appropriate key adjacent to the place identifier. The system automatically positions the waypoint in the flight plan.**

This operation does not create any discontinuity.

The system does not accept an along track waypoint entered at the FROM waypoint.

WAYPOINT INSERTED THROUGH THE USE OF "NEXT WAYPOINT"

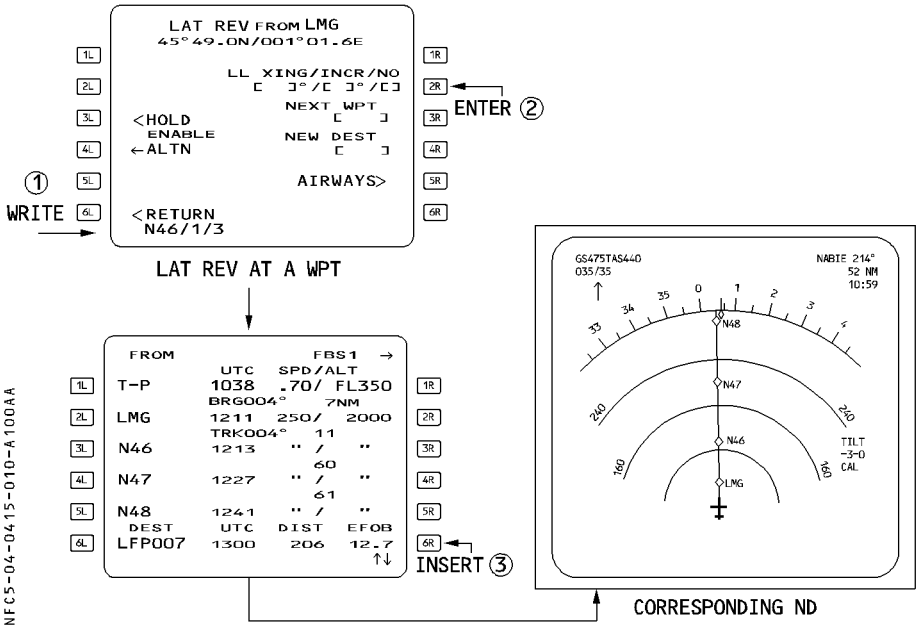


NFC5-04-0415-009-A100AA

- **SELECT the lateral revision (LAT REV) function at an appropriate waypoint.**
- **WRITE the waypoint identifier, or LAT/LONG, or Place/Bearing/Distance, or Place-Bearing / Place-Bearing into the scratchpad.**
- **ENTER it in the brackets under NEXT WPT (next waypoint).**
- **INSERT the temporary flight plan by pressing the [6R] key.**
- **CLEAR the F-PLN discontinuity, as appropriate.**

LATITUDE/LONGITUDE CROSSING WAYPOINT INSERTION

This function allows the insertion of one or several points along the flight-plan beyond the revised waypoint, at fixed latitude or longitude intervals (INCR) from a specified latitude or longitude.
These waypoints are not considered as part of the pilot-defined elements. The system deletes them when sequenced.



– **WRITE the latitude (NXX, XXN, SXX or XXS), the required increment in degrees between the successive waypoints, and the number of required waypoints.**
(Example : The pilot wants to obtain 3 points, every degree from latitude N46 : He enters N46/1/3).

– **PRESS [2R] to insert it into the LL XING/INCR/NO field.**

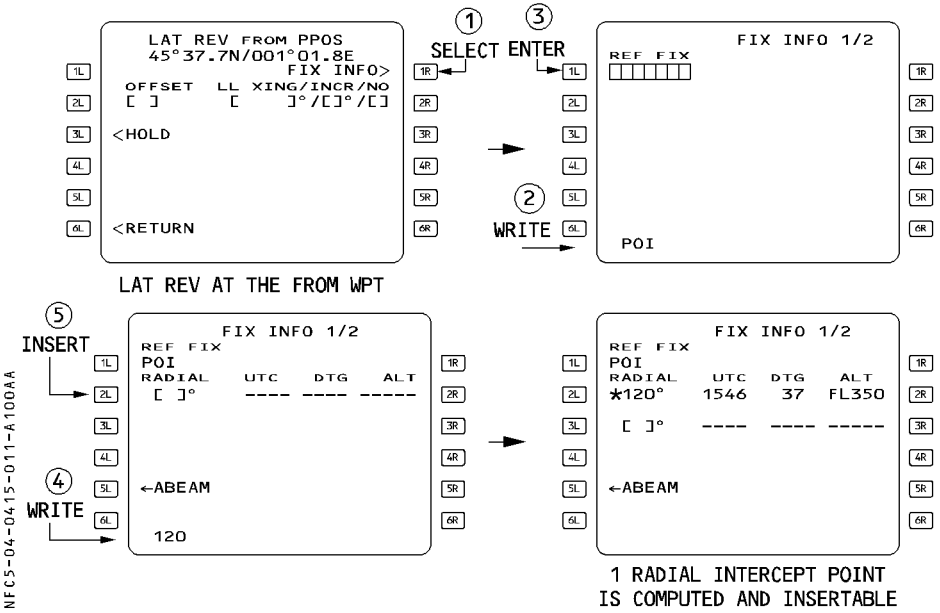
– **PRESS [6R] to insert the new waypoints in the flight plan without discontinuity.**
The system does not store these waypoints in the database.

FIX INFO

When using the FIX INFO function, the pilot defines waypoint intersections of the flight plan with radials associated to a fix.
When the pilot inserts the intersection point, the system automatically identifies this point, but does not store it in the navigation database.
FIX INFO function offers 2 possible waypoint insertions : Radial intercept waypoint and abeam intercept waypoint.

INSERTING A RADIAL INTERCEPT WAYPOINT

The pilot accesses the radial intercept function from the lateral revision page at the origin or "from" waypoint.



NFC5-04-0415-011-A100AA

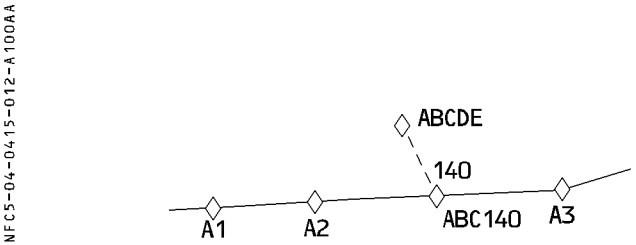
– **WRITE the reference fix identifier into the scratchpad. It may be any database or pilot-defined fix (here POI).**

– **PRESS [1L].**

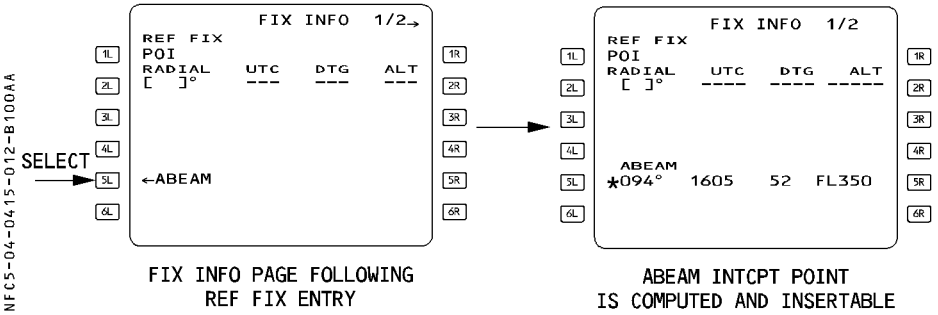
– **WRITE the radial into the scratchpad (here 120°).**

– **PRESS [2L] for the first radial.**
If the radial line intersects the active flight plan, the system computes the time, distance to go, and the altitude at the intersection point.
Up to 3 radials may be entered.

– **SELECT the required radial to insert the associated waypoint into the flight plan :**
The system automatically assigns its ident as the 3 first characters of the reference fix ident, followed by the radial. (Example : ABC 140).



INSERTING AN ABEAM INTERCEPT WAYPOINT



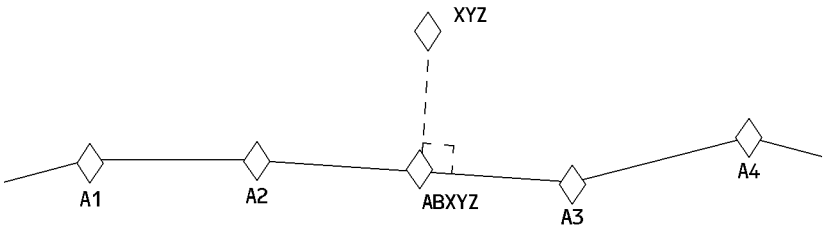
– **WRITE the reference fix identifier into the scratchpad (here POI).**

– **PRESS [1L].**

– **SELECT the ABEAM prompt : The system computes the radial, time, distance to go, altitude and predictions related to the waypoint abeam the reference fix.**

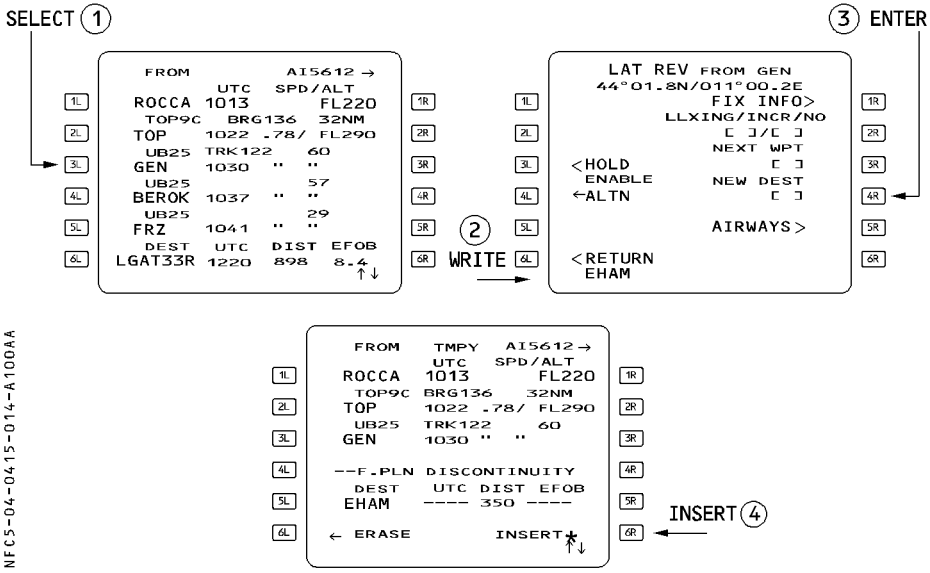
– SELECT [5L] to insert the abeam intercept waypoint into the flight plan : The system automatically assigns its identifier as AB, followed by the first five characters of the reference fix identifier (Example ABXYZ).

NFCS-04-0415-013-A100AA



INSERTING A NEW DESTINATION

The pilot may define a new destination and insert it via the lateral revision page. The pilot may then call up the new destination from any waypoint along the flight plan, except the FROM waypoint, the destination, and the missed-approach waypoint. When the new destination has been inserted, a flight plan discontinuity appears between the revision waypoint and the new destination. All waypoints beyond the revision waypoint (including the previous destination and associated missed approach) are deleted.



- **SELECT the lateral revision function at an appropriate waypoint.**
- **WRITE the new destination in the scratchpad.**
- **Enter it in the brackets under "NEW DEST".**
- **INSERT the temporary flight plan ([6R] key), and complete the flight plan to the new destination.**

HOLDING PATTERN

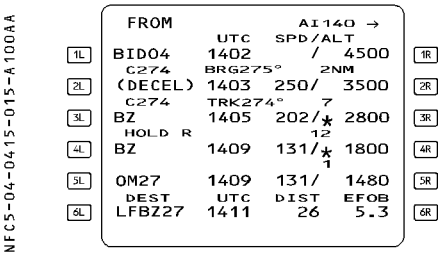
This section describes holding patterns, associated guidance and flight crew procedures. The Flight Management and Guidance Computer (FMGC) has three types of holding patterns that the pilot can use in a flight plan.

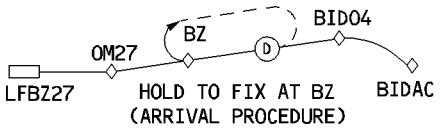
HOLD TO FIX (HF)

The holding pattern is always part of an arrival or departure procedure. The aircraft flies it once and then automatically exits the holding pattern at the fix. The predicted speed in the holding pattern is the lowest of the ICAO speed limit, max endurance speed, or any speed constraint.

Guidance to the fix in the holding pattern is similar to that on any leg of a flight plan. The HF patterns are part of the navigation database and cannot be created by the crew.

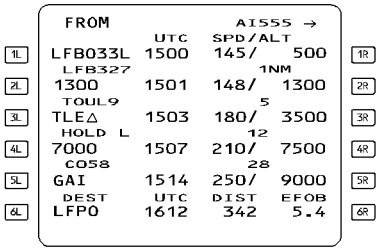
NFCS-04-0415-015-A100AA

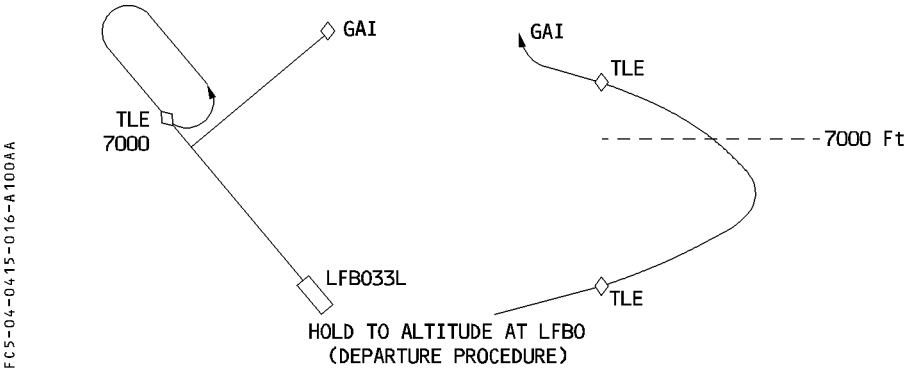




HOLD TO ALTITUDE (HA)

The aircraft flies the hold until it reaches the specified altitude. Then, it automatically exits the hold at the fix.
The predicted speed for the holding pattern is the lowest of the ICAO speed limits, the max endurance speed, or any speed constraint.
The size of the holding pattern is a function of the predicted speed.
Guidance in a hold to altitude (HA) is similar to that for any leg of a flight plan.
The HAs are in the navigation database, as part of the arrival or departure procedures, and cannot be created by the crew.



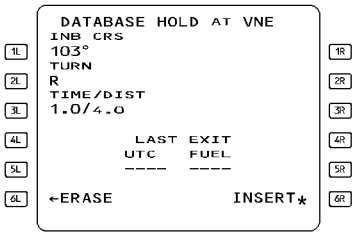


HOLD WITH MANUAL TERMINATION (HM)

This type of holding pattern may be part of an arrival procedure, or the pilot may enter it at the present position or at any flight plan waypoint.
The pilot will use this type of holding pattern to comply with a defined procedure or a clearance limit, or to meet an operational need (such as losing altitude, holding for weather improvement, or absorbing an ATC delay).
This type of holding pattern is exited according to the pilot's decision, not automatically.
There are 3 types of HM.
All are modifiable.

DATABASE HOLD

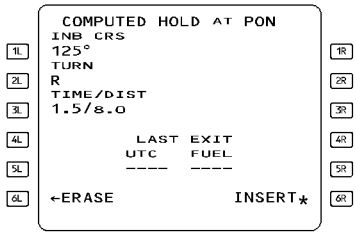
NFC5-04-0415-017-A100AA



If the holding pattern is part of the database, it is named DATABASE HOLD and all its associated data (inbound course, turn direction, time/distance) are defined in the database.
The flight crew can modify this data.

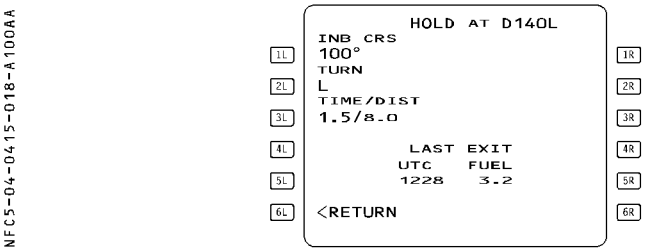
COMPUTED HOLD AT ...

NFC5-04-0415-017-B100AA



If the holding pattern is not in the database, the FMGC designs a holding pattern and proposes it to the pilot. The associated data consists of default values that the pilot can modify.

HOLD AT ...



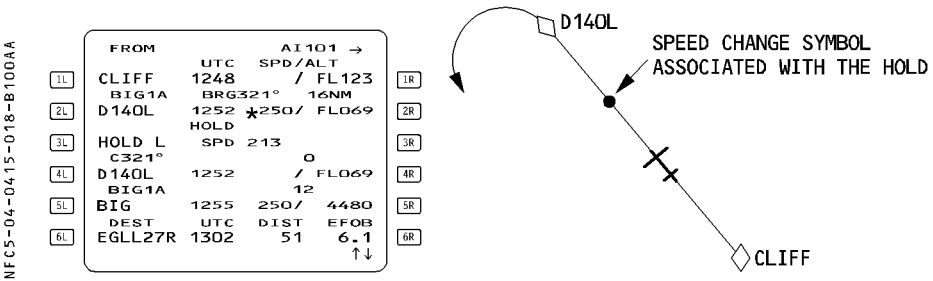
If the pilot inserts into the active flight plan a holding pattern that is manually-corrected from a hold defined by the FMGS, the screen displays a "HOLD AT ..." page. The 2R field displays REVERT TO DATABASE or REVERT TO COMPUTED to restore the database data, if necessary.

PREDICTIONS AND GUIDANCE ASSOCIATED WITH A HM HOLDING PATTERN (HOLD WITH MANUAL TERMINATION)

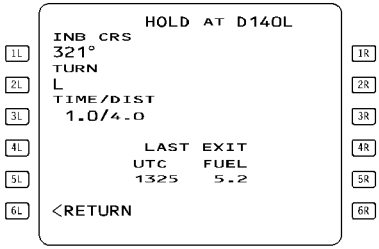
Before deceleration

Although the hold is inserted into the flight plan, the FMGS does not take it into account for predictions until the aircraft enters the hold.

However, if the hold is not deleted by the crew, the FMGS schedules a deceleration point and displays it on the ND.



NFCS-04-0415-019-A100AA



The FMGS predicts the estimated time and amount of fuel remaining at which the aircraft must exit holding, so as to comply with the fuel policy specified on the fuel prediction page.
When the aircraft enters the holding pattern, the FMGS revises all predictions and assumes the aircraft will fly one turn of the holding pattern.
All predictions are revised for one more holding circuit at holding fix overfly.

Upon reaching the speed change pseudo waypoint

The FMGS either causes the aircraft to decelerate to the hold speed (if managed speed is active and NAV mode engaged), or displays "SET HOLD SPD" (set hold speed) on the MCDU and primary flight display, if the flight crew had selected a speed target.
The default hold speed is the lowest of the :

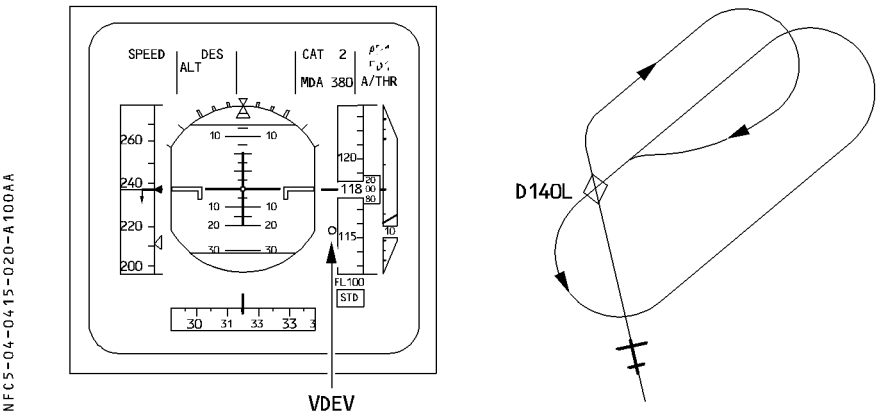
- Maximum endurance speed
- ICAO limit holding speed
- Speed constraint (if any).

R When no specific speed limit applies, the default hold speed is approximately equal to :

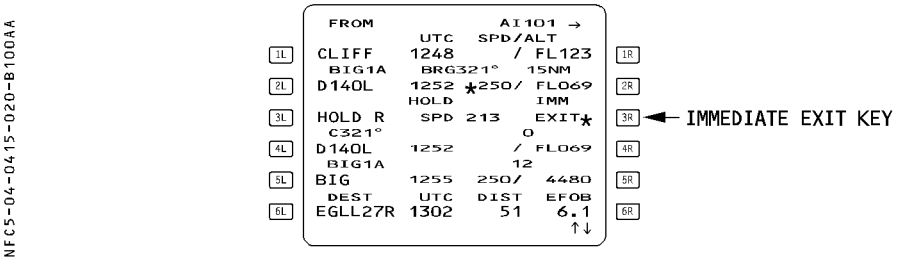
R - Green Dot speed on the A318, A319, A320 (CFM) and A321

R - Green Dot + 20 kts on the A320 (IAE).

The flight plan predictions for time and fuel do not yet consider that the hold will be flown, however, the navigation display shows the hold entry and holding pattern trajectory.



Deceleration receives priority, so that when the aircraft is in descent with the descent mode engaged, it will deviate above the descent path to decelerate. (VDEV becomes positive on the progress page).
The flight plan page displays an immediate exit prompt.
If the flight crew presses the key next to "IMM EXIT" before arriving at the holding fix, the aircraft will not enter the holding pattern, but will resume its phase-related managed-speed profile.



R **After reaching the hold entry fix**

R The aircraft enters the hold. The MCDU HOLD page displays the associated holding data :

R – The inbound course (INB CRS)

R – The TURN direction (L or R)

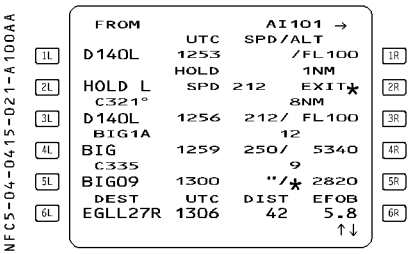
R – The TIME/DIST

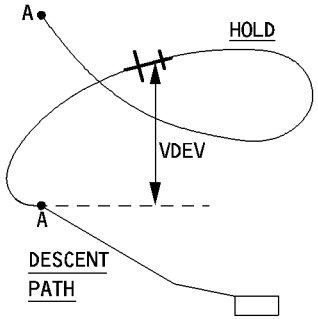
R – The LAST EXIT time and the associated fuel to reach the alternate airport with no extra fuel.

The FMS assumes that the aircraft will fly one turn of the holding pattern, and revises the predictions accordingly.

When the holding pattern is defined by a leg time (and not a leg distance), the system revises the size of the hold as a function of the target speed.

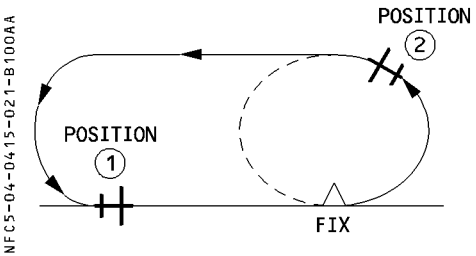
- If managed speed is active, the system uses the predicted holding speed to calculate the size of the holding pattern.
- If the selected speed is active, the system uses the target speed selected by the flight crew at the entry fix sequencing to calculate the size of the holding pattern.
- The VDEV displayed on the primary flight display and the PROG page when the aircraft is flying in the HM (hold pattern with manual termination) is the difference between the aircraft's current altitude and the altitude at which it should be when it reaches the hold exit fix in order to be correctly positioned on the descent path.

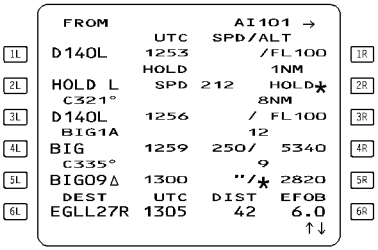




With IMM EXIT pressed (aircraft in the holding pattern)

The predictions and guidance assume that the aircraft is immediately returning to the hold fix. Sequencing the hold fix, the aircraft exits the holding pattern and resumes its navigation. The flight plan page displays "RESUME HOLD*" instead of "IMM EXIT*".





HOLD EXIT PROCEDURE

– Position (1) If "IMM EXIT" pressed, the aircraft will exit at the next fix overfly.

– Position (2) If "IMM EXIT" pressed, the aircraft will make an immediate turn to the fix where the hold will be exited.

If managed speed is active, the computer sets the target speed to the applicable speed of the current phase (for example, speed constraint, ECON speed, or speed limit).
The computer then bases its predictions on the assumption that the flight will continue on the descent path, if the aircraft is in descent.
If DES mode is engaged, the following applies :

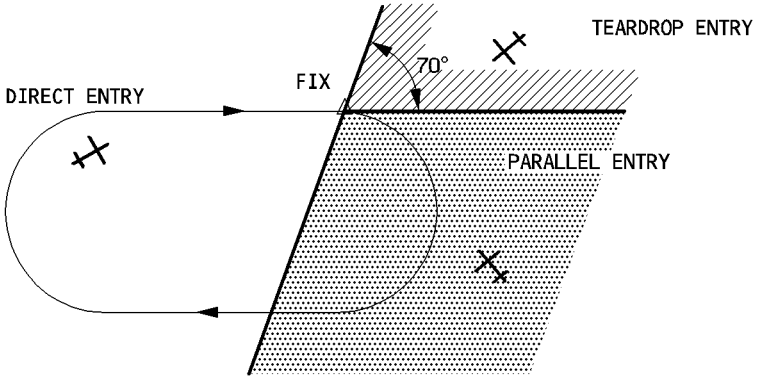
– The holding pattern is never included in the descent path computation.
– The flight crew cannot enter altitude and speed constraints at the hold exit fix. (This is only allowed at the hold entry fix).
– The vertical guidance in the HM, during the descent phase, calls for a constant – 1 000 feet per minute. But the computer considers altitude constraints that will take effect farther down the flight path as it calculates vertical guidance and predictions. The system will not allow the aircraft to descend below the next altitude constraint, neither the FCU selected altitude. If the aircraft reaches the next altitude constraint, it will level off and the altitude constraint mode will engage.

With RESUME HOLD pressed

If the flight crew presses the key next to "RESUME HOLD", the aircraft remains in the holding pattern, and "IMM EXIT" is displayed again.
After that, each time the aircraft flies over the holding fix, the system updates the predictions for one more holding circuit.

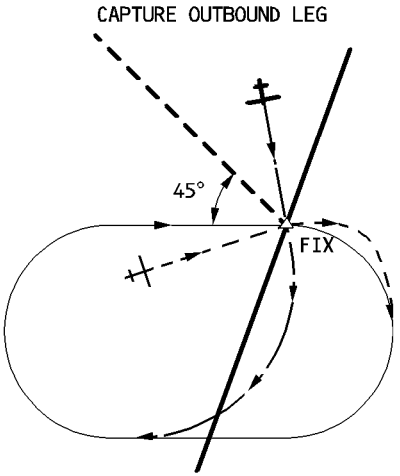
HOLDING PATTERN ENTRIES

The FMGS offers three types of entry into holding patterns :
1. Direct entry
2. Teardrop entry
3. Parallel entry



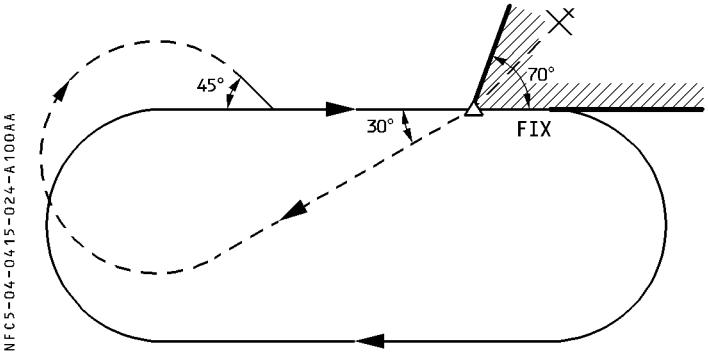
NFC5-04-0415-023-A100AA

1. The direct entry

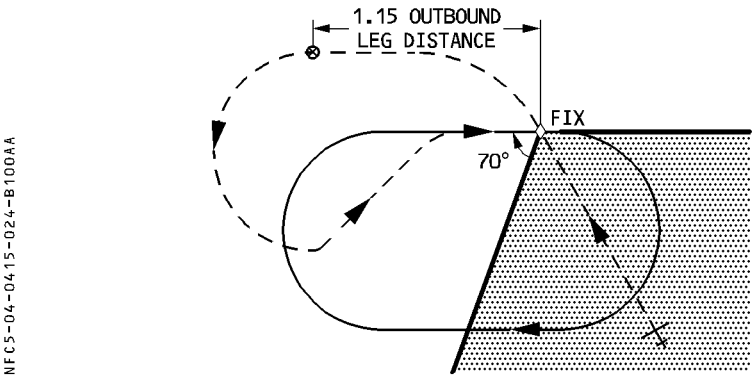


NFC5-04-0415-023-B100AA

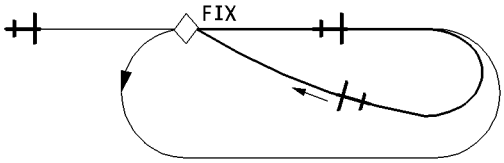
2. The teardrop entry



3. The parallel entry



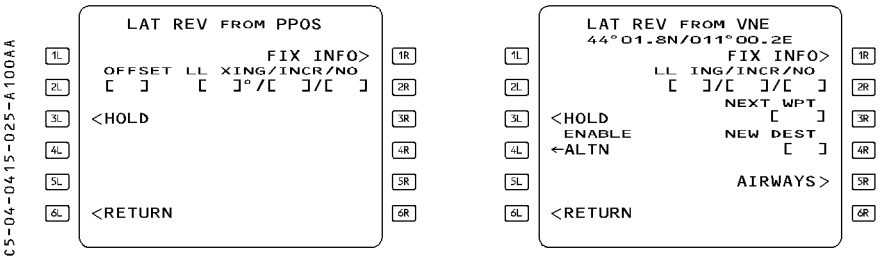
Note : If the leg the aircraft is flying toward the holding fix is on a "limit" between a teardrop entry and a parallel entry, the FMGC may compute and display either of the two entries. The pilot should keep this in mind and should not assume that the FMGC is malfunctioning.
If the flight plan leg toward the hold entry fix is on a course that is the reciprocal of the inbound course of the holding pattern, the aircraft will fly a parallel entry.



PROCEDURE TO INSERT A HOLD (HOLD WITH MANUAL TERMINATION)

The HOLD prompt allows the flight crew to enter a hold with manual termination (HM), at the revised waypoint or at the present position.

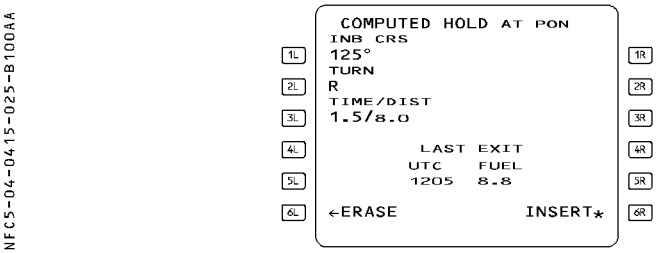
R The flight crew accesses the HOLD page from a lateral revision at the present position
R (PPOS) or at a waypoint.



LAT REV AT PRESENT POSITION — LAT REV AT A WPT

- **SELECT lateral revision at present position (PPOS), or an applicable waypoint.**
- **PRESS the HOLD prompt [3L].**
- **CHECK and (if necessary) MODIFY the HOLD data.**
- **CHECK the temporary flight plan and INSERT it, if appropriate.**

R



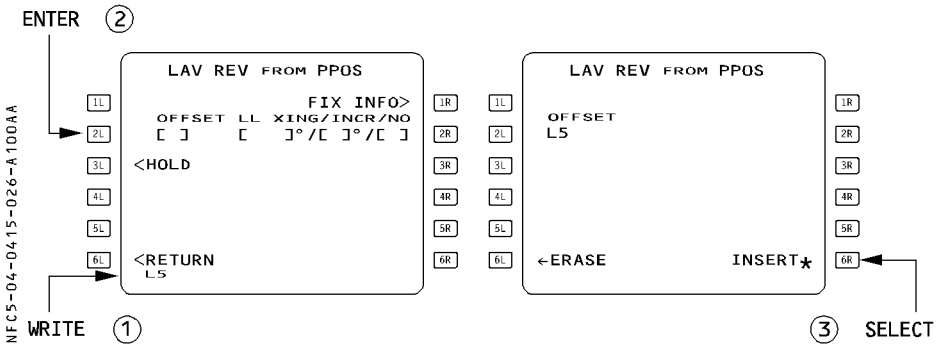
PROCEDURE TO DELETE A HOLD (HOLD WITH MANUAL TERMINATION)

- **CLEAR the HOLD directly in the flight plan, as can be done for a normal waypoint.**

OFFSET

Offset allows the pilot to define a lateral offset to the left or right of the active flight plan. Once inserted, the offset applies from the present position (PPOS) all along the flight plan to the first waypoint (WPT) at which a holding pattern is defined, or to the last waypoint before the runway.
In most cases, the pilot will use it enroute because of an ATC clearance, or to avoid bad weather expected along the flight plan route.
Accessed from lateral revision (LAT REV) at the present position page, an offset may be defined between 1 and 50 nautical miles in one-nautical-mile steps.
After inserting the offset in the flight plan, the flight plan page shows OFST in its title, and the navigation display shows the offset flight plan with a solid green line and the original flight plan with a dashed green line.
The offset is cleared :
– Automatically (holding pattern, approach), or
– Manually with the clear (CLR) key.

Note : If the pilot enters an OFFSET when the aircraft is too close to the TO waypoint, the FMGS may refuse to accept it, in which case the MCDU displays the "ENTRY OUT OF RANGE" message.



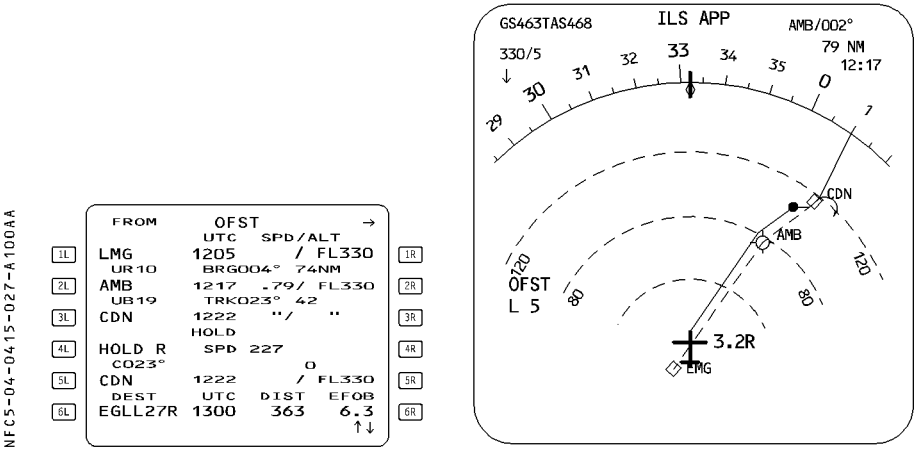
INSERTING AN OFFSET

– SELECT LAT REV at present position (PPOS)

– WRITE the required offset value and direction (for example, L5 or 5L).

– PRESS [2L] to enter the offset into the OFFSET field.

– PRESS [6R] to activate the OFFSET.



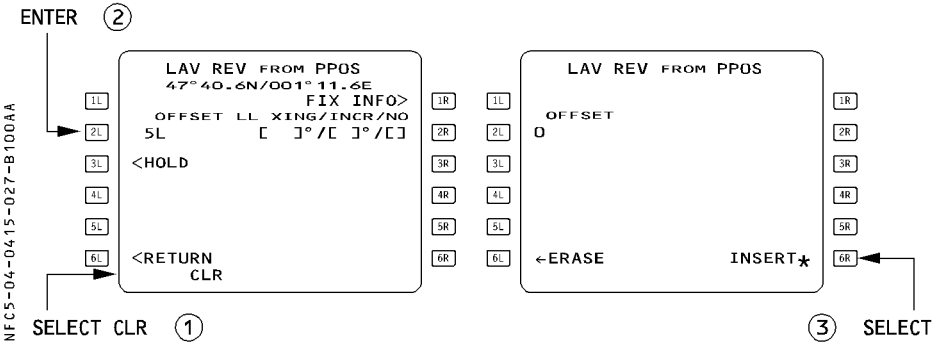
MANUAL CANCELLATION OF AN OFFSET

There are two standard methods for cancelling an offset :

- **1. SELECT DIR TO a waypoint (the next waypoint, for example).**
- **2. SELECT a Lateral Revision (LAT REV) at FROM WPT.**

  – CLEAR the OFFSET field.

  – PRESS [6R] to activate the temporary flight plan (cancelling OFFSET).



ALTERNATE FUNCTION

The ALTERNATE FUNCTION performs two actions :
– It reviews and defines alternate airports and inserts them into the flight plan.
– It allows a diversion to be activated through the ENABLE ALTN command.

REVIEW AND SELECTION OF ALTERNATE AIRPORT

Several alternate airfields may be stored in the database and assigned to a destination. When the pilot selects a company route (CO RTE) (or a city pair), the computer strings the preferred alternate into the active flight plan.
The pilot may review the alternate airports on the ALTN page and, if the one selected is not suitable because of weather or fuel considerations, another alternate may be strung into the active flight plan.
The pilot may define an additional alternate airport into the list, if necessary.
The ALTERNATE page shows the track and distance (airway or direct) between destination and alternate, as well as fuel management data (EXTRA fuel, assuming the associated airfield is the alternate airport). This data will help the pilot change the preferred alternate, if necessary.
Access the ALTERNATE page through the ALTN prompt on the LAT REV page at destination.
Alternate airfields are attached to the destination.

ENTERING NEW ALTERNATE INTO THE F-PLN

If the preferred alternate is unsuitable, proceed as follows :

– **SELECT F-PLN key on MCDU.**

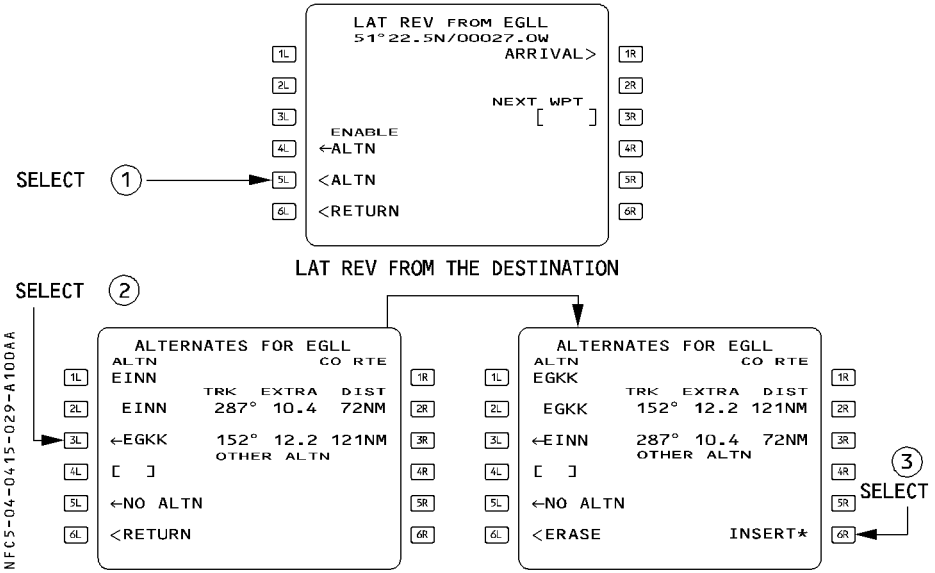
– **SELECT LAT REV at destination.**

– **SELECT ALTN [5L].**

– **SELECT an AIRFIELD IDENTIFIER.**

– **INSERT the temporary flight plan.**

Note : If weather and destination airfield conditions permit, you may select "NO ALTN". Fuel predictions will be computed without alternate fuel.



SELECTION OF ANOTHER ALTERNATE

Fuel management information for flight to another alternate airfield may be obtained by selecting the OTHER ALTN field.

– SELECT LAT REV at DESTINATION

– SELECT ALTN [5L].

– ENTER the airfield identifier in the brackets.
- If the airfield is not in the database, the NEW RUNWAY page automatically appears.
- If the airfield is in the database and there is a company route (CO RTE) to it, the ROUTE SELECTION page automatically appears.

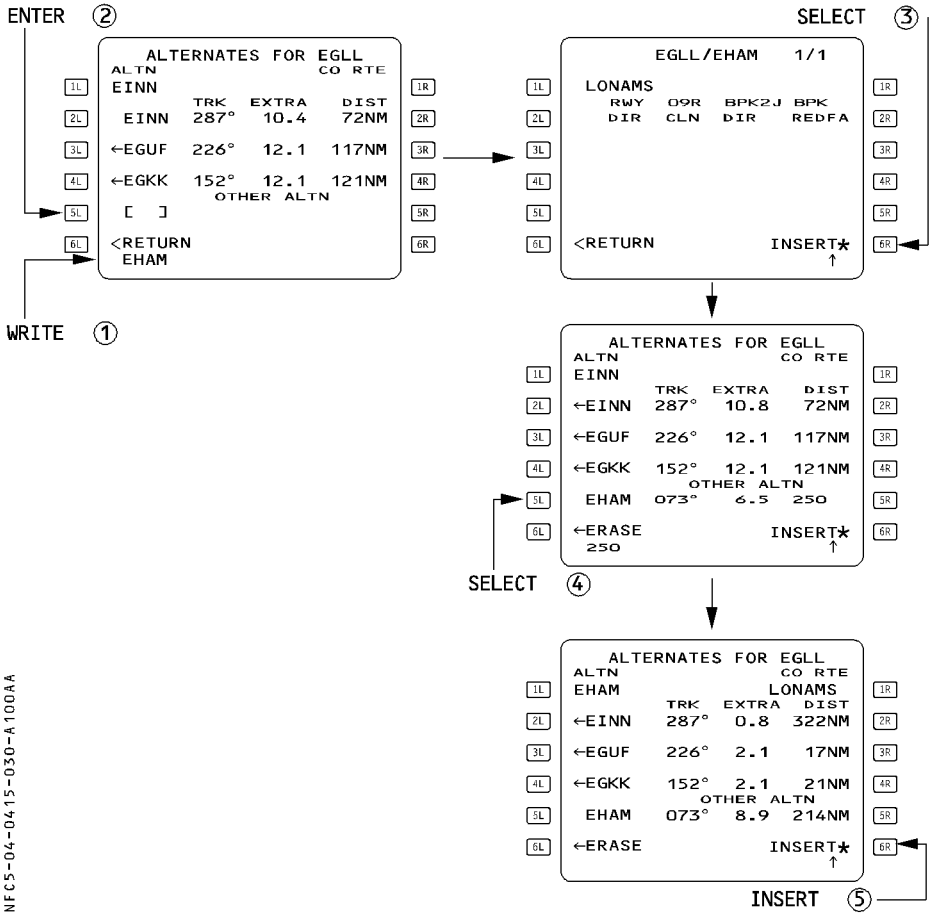
– SELECT the route, as appropriate, or RETURN to the ALTN page.

– ENTER the distance in the brackets (if required). XTRA fuel and track (TRK) will appear.

– SELECT the other alternate (OTHER ALTN) as a primary alternate if convenient. (EXTRA fuel and DIST revert to AIRWAY distance).

– INSERT it, if you want to have it as a primary alternate.

Note : — *The pilot can always overwrite the "OTHER ALTN". The new "OTHER ALTN" then replaces the previous one, which is lost.*
— *The pilot can select OTHER ALTN as a primary alternate (active flight plan), to replace any alternate on the initial list.*
— *If the pilot selects the other alternate as a primary alternate, and overwrites the OTHER ALTN field by entering a new airport, the first one will remain a primary alternate and the system will memorize a second OTHER ALTN.*



The pilot may enter a distance in the OTHER ALTN field. The system will compute the extra fuel and the track for this distance.

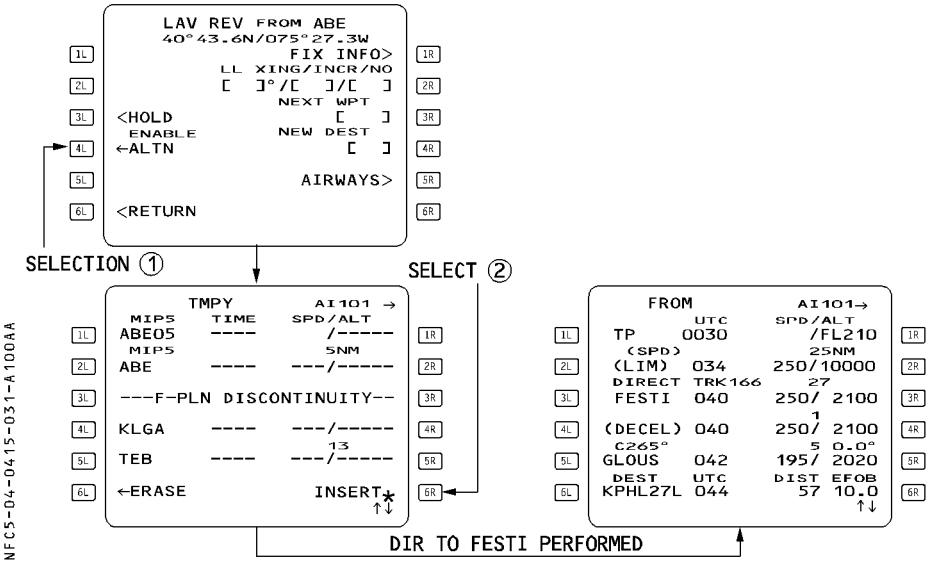
PREDICTED DATA FOR ALTERNATE

Data predictions are based on :

* Aircraft weight being equal to landing weight at primary destination.
* Flight at flight level 220 if the airway distance is less than 200 NM ; otherwise, at flight level 310.
* Cost index 0.
* Constant wind (as entered in the alternate field of the DES WIND page).
* Constant delta ISA (equal to delta ISA at primary destination).
* Airway distance for a company route ; otherwise, direct distance manually-entered by the pilot in the OTHER ALTN field (used only for preliminary predictions).

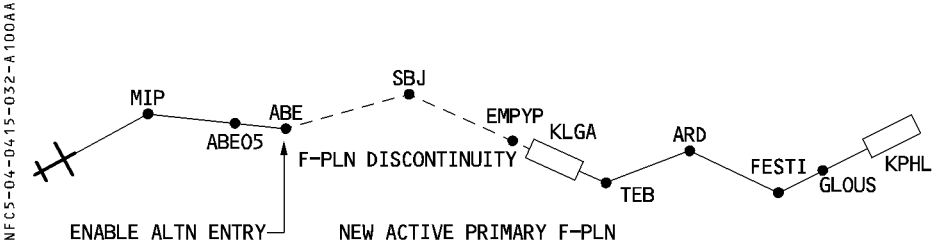
ENABLE ALTN

This enables the pilot to initiate a diversion by entering the alternate flight plan just after the revision waypoint (with a discontinuity).
The pilot may have to adjust the resulting flight plan (use "direct to", or add or suppress waypoints), depending on the circumstances.



TO ACTIVATE THE PRIMARY ALTN :

- **SELECT a LAT REV at the "TO" waypoint (or at another suitable waypoint).**
- **PRESS the ENABLE ALTN key.**
- **INSERT the temporary flight plan.**
- **ENTER an appropriate waypoint in DIRECT TO and adjust the flight plan.**
- **ADJUST the cost index on the PERF page and the defaulted cruise flight level (CRZ FL) on the PROG page, as required.**



When ENABLE ALT is pressed at ABE, a flight plan discontinuity is created from ABE down to destination and the alternate route is linked to the active flight plan.

DIR KEY (DIRECT-TO-FUNCTION)

The pilot uses the "Direct To" function to define a direct leg from the present position to any waypoint on the active flight plan or to any waypoint.
The designated waypoint may be entered by its identifier (if it is stored in the database) or by a latitude/longitude, place/bearing/distance, or a place-bearing/place-bearing.

Note : If the autopilot or flight director is in the heading/track or localizer mode, the "DIR TO" function engages the NAV mode.

Three functions are available through the DIR TO key :

- The DIR TO defines a direct leg from the present position to a specified waypoint.
  NAV mode engages simultaneously to the DIR TO selection.
  When the pilot uses DIR TO, the present position (PPOS) becomes the "FROM" waypoint and the active flight plan shows it as the T-P (turn point).
- The DIR TO/ABEAM function, defines the abeam waypoints along the direct leg. These waypoints are the projection on the direct leg of the initial F-PLN waypoints located between the aircraft position and the specified waypoint.
  NAV mode engages simultaneously to the DIR TO/ABEAM selection.
- The DIR TO/INTCPT function allows the definition of a specified RADIAL INBOUND or OUTBOUND at an inserted waypoint. The current aircraft track is used to compute the INTCPT point with the specified radial.
  NAV mode is armed simultaneously to the DIR TO/INTCPT selection.

The ND displays the DIR TO leg as a temporary flight plan leg between current aircraft position and specified waypoint. In case of a DIR TO/INTCPT, the leg is not displayed when the angle between the current aircraft track and the intercept radial exceeds 160°.

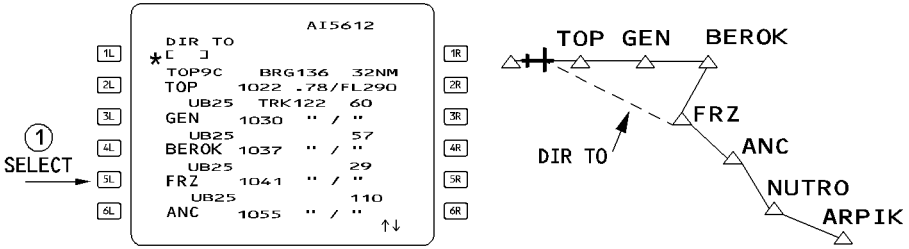
PROCEDURE FOR DIR TO WAYPOINT

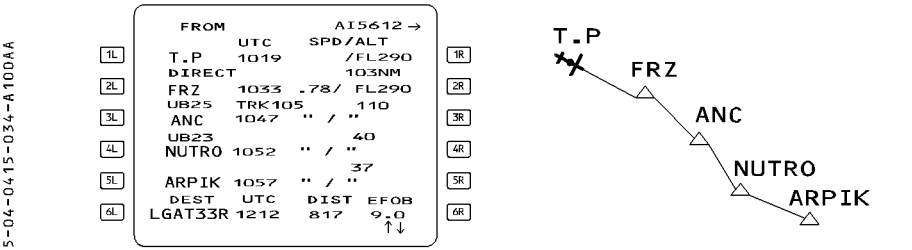
Case 1. The "TO" waypoint is in the flight plan

Example : DIR TO FRZ

– PRESS the DIR key on the MCDU.

– PRESS the line select key next to "FRZ".





NFCS-04-0415-034-A100AA

RESULTING F-PLN AND ND DISPLAY

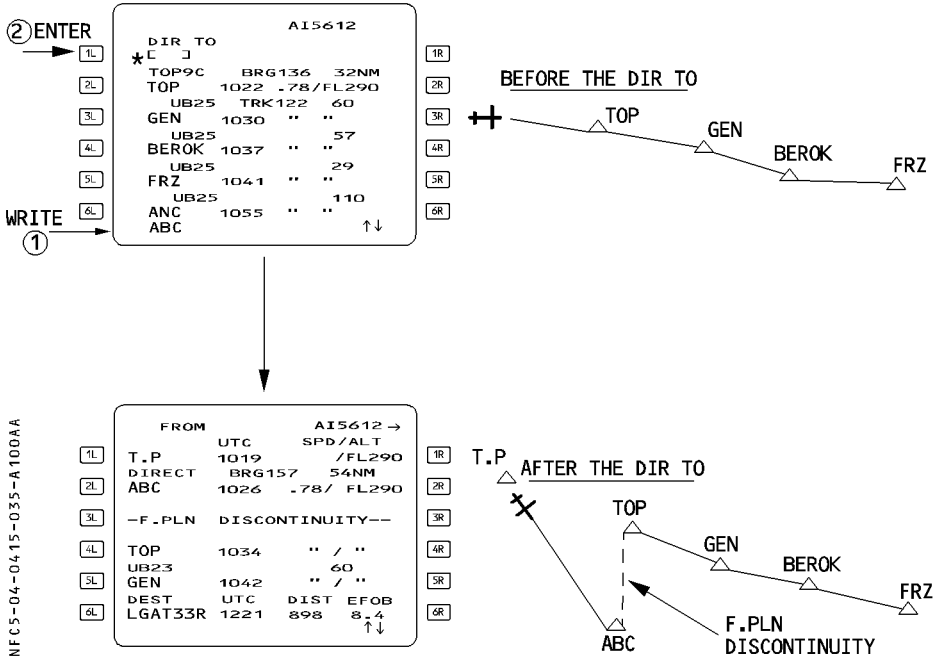
Case 2. The "TO" waypoint does not belong to the flight plan

Example : Direct to ABC (ABC being an ident, LL or PBD or PB/PB)

– PRESS the DIR key.

– WRITE the waypoint identifier (e.g. ABC) into the scratchpad.

– PRESS [1 L] to enter "ABC" in the "DIR TO" field.

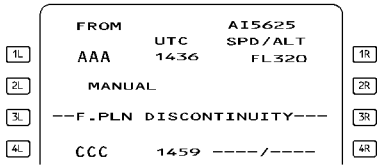


Clear the discontinuity and the waypoints that are not included in the new flight plan.

PARTICULAR CASES FOR USE OF DIR TO

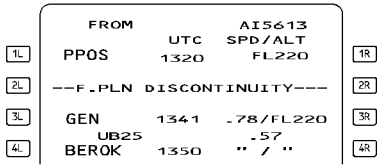
– If the pilot is flying a manual leg (part of a SID or STAR), the flight plan page dislays "F-PLN DISCONTINUITY", preceded by "MANUAL" (see below).
These legs are specific heading or track legs flown with no defined end waypoint.

NFC5-04-0415-036-A100AA



– When the pilot encounters a flight plan discontinuity, or if a major reset occurs, the flight plan page displays "PPOS – F-PLAN DISCONTINUITY", and the pilot looses managed guidance in both the lateral and vertical plans.
The autopilot or flight director reverts to the basic HDG V/S (or TRK FPA) modes. Predictions remain available and are based on the assumption that the aircraft will fly a direct leg from its present position to the next waypoint.

NFC5-04-0415-036-B100AA



– In both of these cases, the only way to get back to a standard flight plan is to perform a "DIR TO" to a designated waypoint.

– Following a DIR TO, the message "MAP PARTLY DISPLAYED" may appear on the NDs, if the new flight plan includes a very long leg. (Refer to the description in 1.31.45). When this message comes up, enter an intermediate waypoint to shorten the leg.

R *Note : During cruise, the DIR TO function is not available as long as uplink wind data,*
R *received through ACARS (◁), is not inserted or cancelled on the CRUISE WIND*
R *page.*

PROCEDURE FOR DIR TO/ABEAM

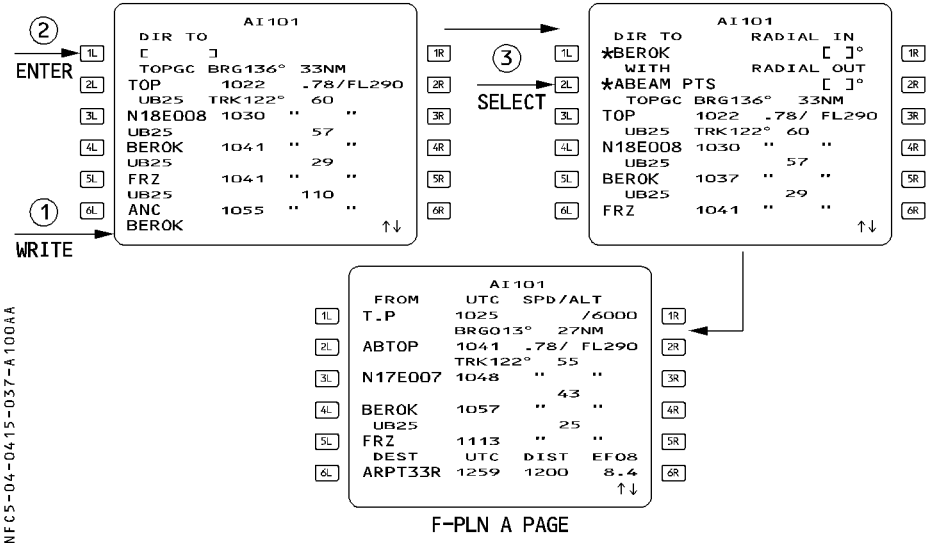
Example : DIR TO/ABEAM BEROK

– PRESS the DIR key on the MCDU.

– WRITE the waypoint identifier into the scratchpad (Example : BEROK).

– PRESS [1 L] to enter the waypoint in the DIR TO field.

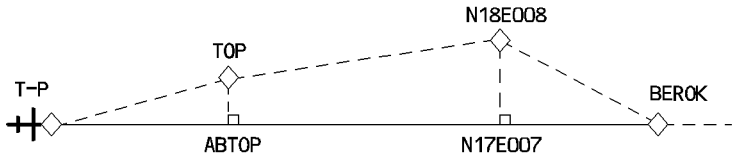
– SELECT the ABEAM PTS function.
The display reverts to F-PLN A page.



NFC5-04-0415-037-A100AA

Note : 1. If, between two waypoints projected on the direct leg, there was a discontinuity in the original flight plan, this discontinuity disappears between the corresponding abeam points on the direct leg.

2. If the pilot enters a latitude/longitude type reference waypoint, the system renames the abeam point with its recomputed coordinates (only in degrees).



NFC5-04-0415-037-B100AA

PROCEDURE FOR DIR TO/INTERCEPT

– **PRESS the DIR key.**

– **WRITE the waypoint identifier into the scratchpad.**

– **PRESS [1L] to enter the waypoint in the DIR TO field.**
In the [1R] and [2R] fields, the MCDU displays the functions radial inbound and radial outbound from the waypoint.
If the waypoint belongs to the flight plan, the system displays the flight plan track as the default inbound radial. The crew can modify it.

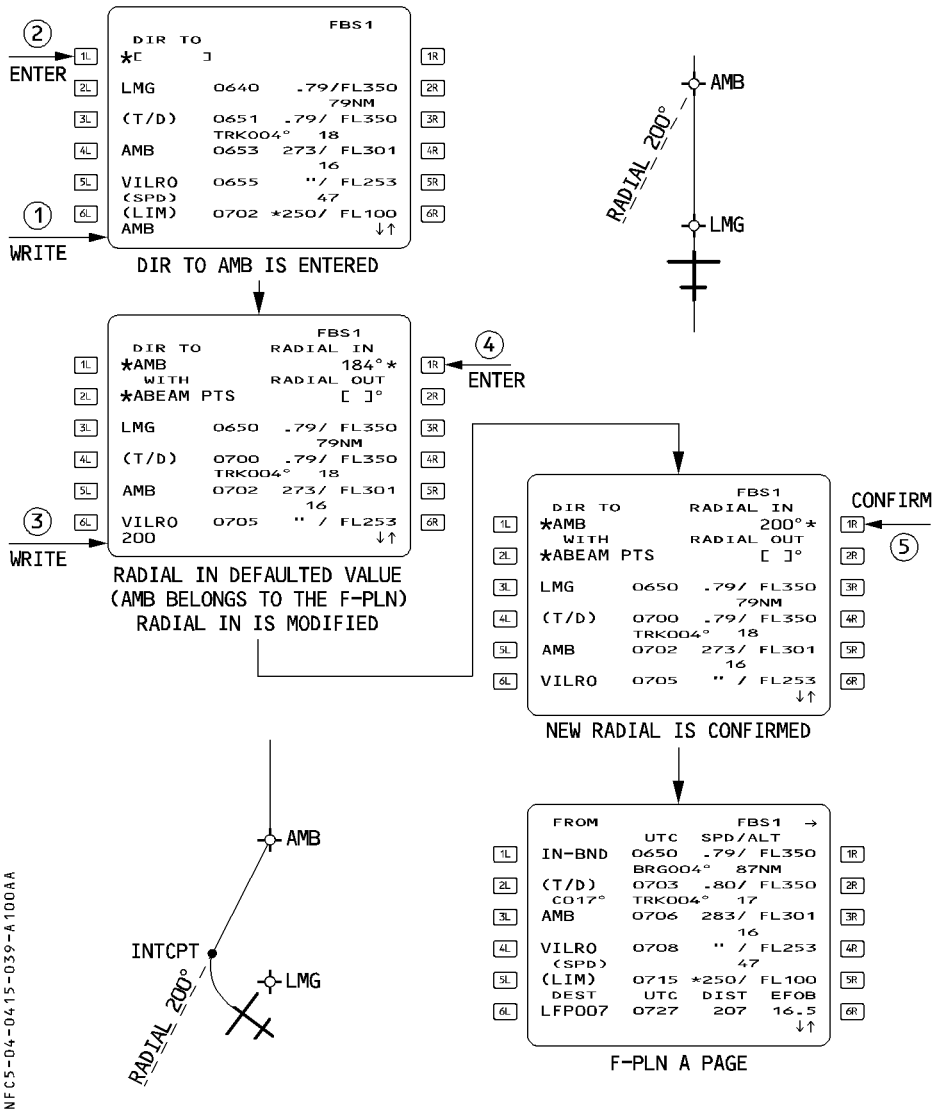
– **WRITE the required in or out radial into the scratchpad.**

– **PRESS [1R] or [2R] to enter the radial in the required field.**
The ND displays the entered radial as an amber dotted line : The pilot can still modify it.

– **PRESS [1R] or [2R] to confirm the DIR TO/INTERCEPT selection.**
The display reverts to the F-PLN A page, the system arms the NAV mode, and engages the HDG mode. The FROM waypoint is the aircraft position at the time of the DIR TO/INTERCEPT selection. The MCDU indicates it as INBND or OUTBND.

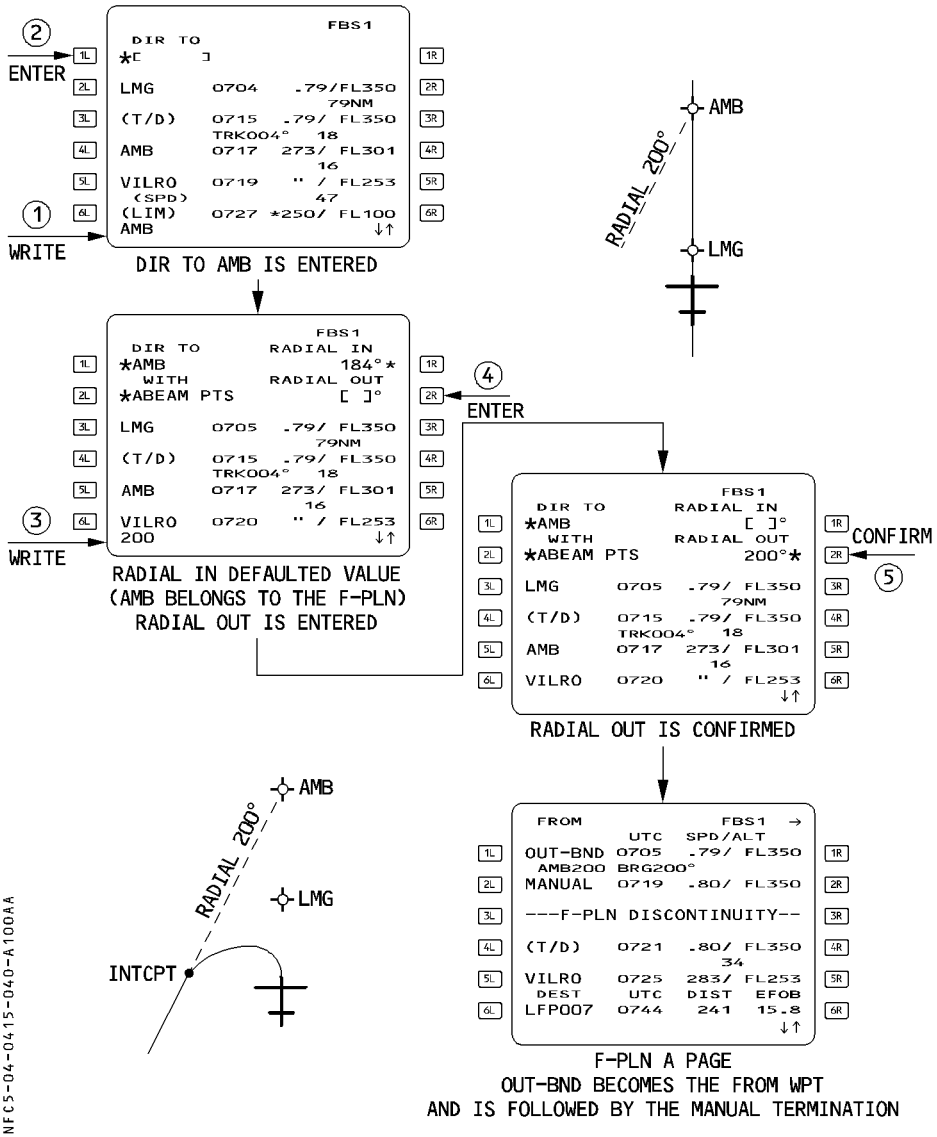
Note : 1. If the waypoint does not belong to the flight plan, the system strings the DIR TO/INTERCEPT leg to this waypoint, and inserts a discontinuity following the waypoint.
2. A DIR TO/INTERCEPT cancels any active offset.
3. If the current AP/FD lateral mode is HDG or TRK, NAV becomes armed.
If the NAV mode was engaged, NAV becomes armed. FCU HDG or TRK must be used to guide the aircraft.
The ND displays an intercept point, if the intercept angle is less than 120°. The system constantly updates it to reflect the current aircraft track and position with respect to the intercept radial. The NAV mode engages when reaching the intercept point.

Example : RADIAL INBND
DIR TO AMB - RADIAL 200° INBOUND



NFC5-04-0415-039-A100AA

Example : RADIAL OUTBND
DIR TO AMB - RADIAL 200° OUTBOUND

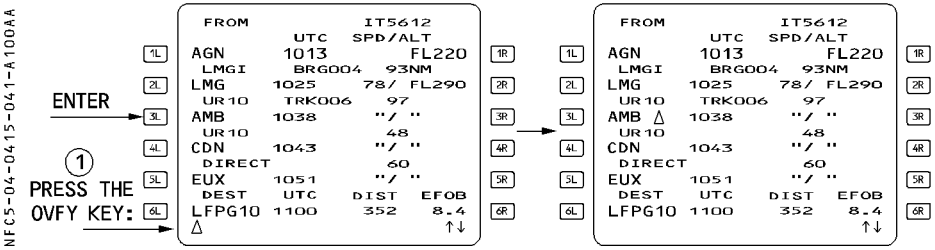


OVFY (OVERFLY) KEY

The overfly key programs the Flight Management Guidance Computer to fly over a specific waypoint or navaid. To use it :

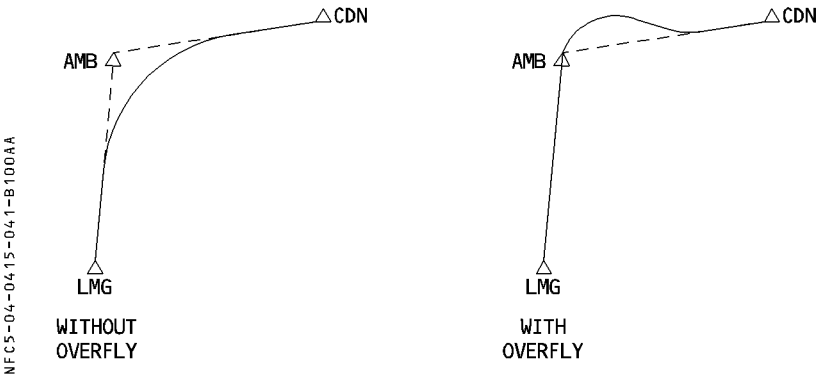
– **PRESS the "OVFY" key.**
A "△" appears in the scratchpad.

– **INSERT it by pressing the key adjacent to the waypoint to be overflown. [3L] in this example.**



NFCS-04-0415-041-A100AA

The pilot cannot cancel the overfly program. If you do not want to fly over the point you have entered, use DIR TO (direct to) the next waypoint or engage the heading mode, whichever is more suitable.

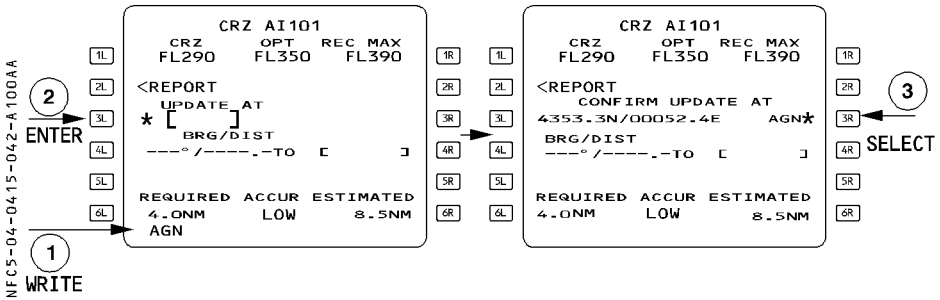


NFCS-04-0415-041-B100AA

The overfly function allows you to fly over a specific waypoint, and return the aircraft to the great circle track.

"UPDATE AT"

To manually change the position computed by the FMGC (FM position and bias), the pilot uses "UPDATE AT" on the progress page.
Use this facility with extreme caution : It is apt to be inaccurate, because it relies on the pilot's estimation of when a designated position has been reached.



R — **WRITE the ident for the navaid (or waypoint or airport), or the coordinates, or the PBD or PB/PB at which the update is intended.**

— **PRESS [3L] to enter the ident in the "UPDATE AT" field. The coordinates of the point, along with its identifier (or "ENTRY", if the identifier is not in the database), appear in that field.**

— **PRESS [3R] to activate the update, when you estimate that you are at the position.**

Note : The system reinitializes the Estimated Position Error computation when a position update is performed. This may lead to the appearance of a "NAV ACCUR DOWNGRAD" or "NAV ACCUR UPGRAD" message.

If the "UPDATE AT" does not properly take effect, it corrupts the FM position.

- In an area with good radio navaid coverage :
  - If the update error is small, subsequent radio position updating will correct the FM position.
  - If the update error is large, the system will reject any radio updating because its internal "reasonableness test" will reject the various navaids. Thus, the FM position will only be the MIX IRS position corrected by the position bias, determined at the time of the update, and the error will be maintained.
- In an area without proper navaid coverage, radio position updating will not be available and the FM position, if incorrect, will remain incorrect until a new manual update is performed.
- Therefore, the pilot should only use "UPDATE AT" in case of a major position problem, such as :
  - On the ground, no flight plan appears on the navigation display and ARC/ROSE NAV mode is selected .
  - A "CHECK IRS/FM POSITION" message appears on the MCDU.
  - A "FM/IR POSITION DISAGREE" message appears on the ECAM.

When GPS PRIMARY is operative, the FM position will always converge towards the GPS position at a rate depending on the aircraft altitude. Therefore, when GPS PRIMARY is operative, an inaccurate "update at" will have a temporary effect on the FM position.

GENERAL

The lateral revision function enables the pilot to create or modify the following parts of the flight plan :

- Airway
- Waypoint
- New destination
- Holding pattern
- Offset
- Alternate
- Fix information
  Each time the pilot activates one of the above-listed revisions, he accesses a temporary flight plan that enables the modification to be checked before inserting it in the active flight plan. The crew selects these functions by pressing the left keys on F-PLN A or B.
- Direct to and overfly functions are accessed via the MCDU keys. No temporary flight plan is created with these functions.
- "Update at" capability is a specific function that manually updates the FM position. It does not use a temporary flight plan, but the pilot must confirm its insertion before it is activated.

TEMPORARY F-PLN (TMPY)

A temporary F-PLN is created whenever a revision is performed on either of the following pages :

- The F-PLN A or B pages, or
- The DIR TO page, or
- The LAT REV page, or
- The VERT REV page.

It is also created upon an Engine-Out detection.

The temporary F-PLN enables the performance of multiple revisions, and use of the UNDO function. This is a copy of the active F-PLN, but is corrected by the lateral or vertical revisions in progress.

The UNDO function is available when there is more than one pending revision in the temporary F-PLN. It can only be used once by the crew to cancel the last revision in the temporary F-PLN.

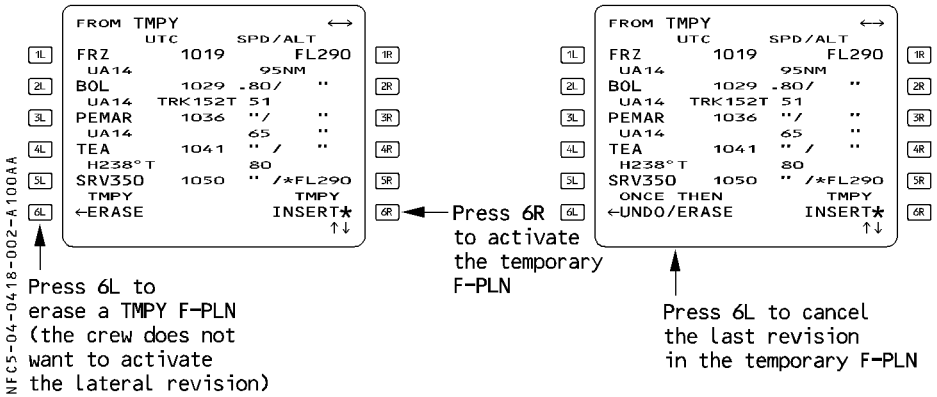
The temporary F-PLN created subsequently to a DIR TO function can only be modified once.

The aircraft continues to follow the active F-PLN, until the temporary revision is inserted.

The temporary F-PLN is continually sequenced as the active F-PLN, until it diverges from the active F-PLN.

The revision data appears in yellow on both MCDUs and NDs.

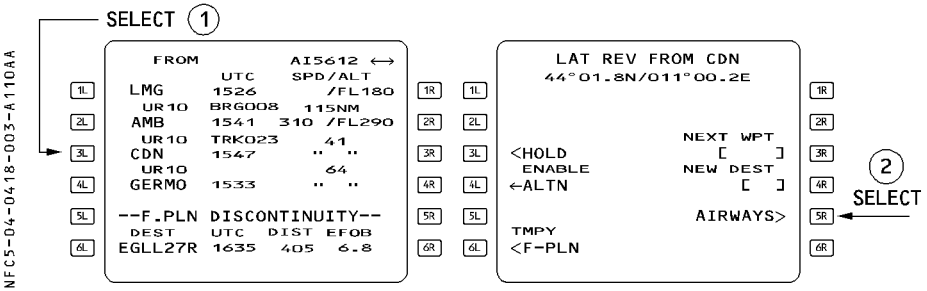
- Lateral and vertical revisions can be made on a temporary F-PLN.
- Only one temporary F-PLN may be accessed at a time.
- A revision is rejected whenever a DIR TO revision is already is process. (The "DIR TO IN PROCESS" message appears on the MCD.
- A TMPY F-PLN changes the title of the flight plan pages. (TMPY appears in all titles).
- The predictions are continually updated for a temporary flight plan.



Temporary data is displayed in yellow (ND and MCDU). Once inserted, it becomes active and is displayed in green.

INSERTING AN AIRWAY WITH "VIA"

In the active F-PLN, the crew can insert up to 5 successive airway segments, going from a revised waypoint or ending at a given waypoint of the flight plan.

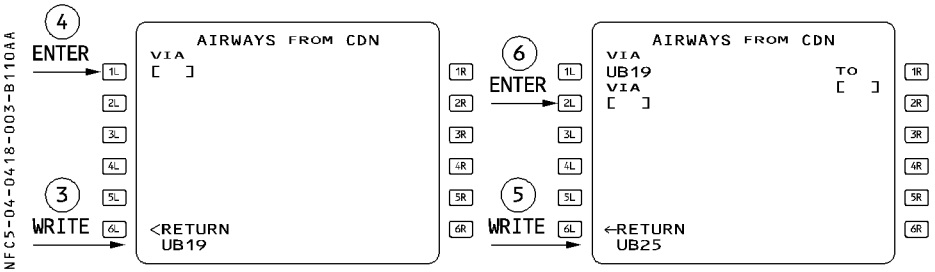


– SELECT the revised waypoint (Here : CDN).

– PRESS [5R] to select the AIRWAYS prompt.

TO INSERT SUCCESSIVE AIRWAY SEGMENTS FROM A WAYPOINT

For example, from CDN - Airway UB19 – Airway UB25 – Ending point AAA.



– WRITE the first airway ident in the scratchpad (here "UB19").

– PRESS [1L] to insert it into the VIA field.

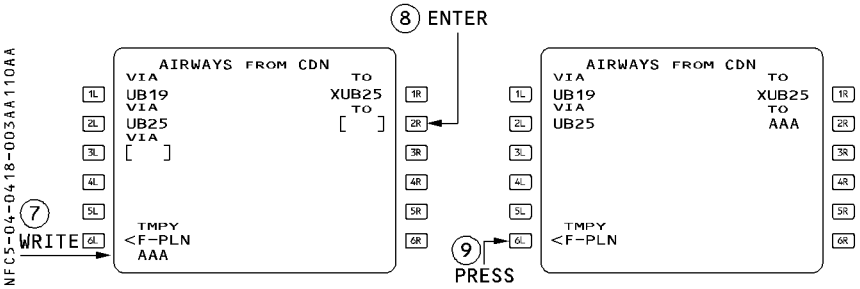
– WRITE the second airway ident in the scratchpad (here "UB25").

– PRESS [2L] to insert it into the VIA field.

The system automatically determines the first downpath intersection point between the two airways.

- If the airways have a common waypoint, the system selects it as the ending point of the first airway.
- If they have no common waypoint, but have a single intersection, the system creates this intersection as an FM-computed point and displays "X", followed by the second airway's ident (here XUB25).
- If they have no common waypoint or intersection, the system displays NO INTERSECTION FOUND in the scratchpad.

When the required airways (up to 5) have been entered, the crew enters the ending point of the last selected airway :



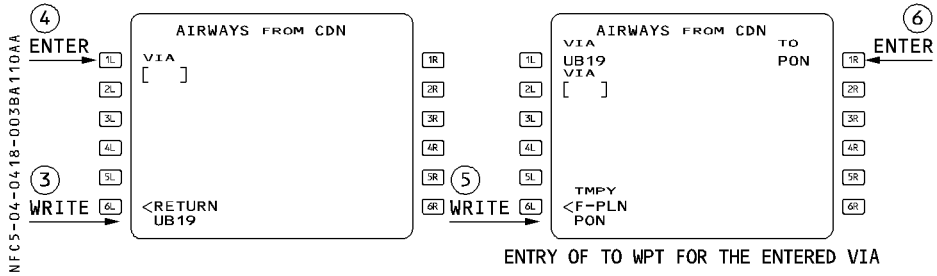
– WRITE the ending waypoint in the scratchpad (here "AAA").

– PRESS [2R] to insert the ending waypoint into the TO field.

Note : If two waypoints with the same ident belong to the same airway, the DUPLICATE NAMES page will not be called up, and the system selects the first one in the database.

– ACCESS the TMPY flight plan [6R], review it (and revise it if necessary) and insert it.

TO INSERT ONE AIRWAY SEGMENT TO AN ENDING WAYPOINT



– WRITE the airway ident in the scratchpad (here UB19).

– PRESS [1L] to insert it into the VIA field.

– WRITE the ending waypoint in the scratchpad (here PON).

– PRESS [1R] to insert it into the TO field.

Note : – If the revise waypoint, or the ending waypoint, does not belong to the entered airway, the system displays AWY/WPT MISMATCH in the scratchpad.
– If two waypoints with the same ident belong to the same airway, the DUPLICATE NAMES page will not be called up and the system selects the first one in the database.

FLIGHT PLAN INSERTION

The flight crew uses the "< TMPY F-PLN" prompt to access and review the TMPY F-PLN. When the TMPY F-PLN has been checked, and if necessary modified, the crew inserts it.

– PRESS [6L] to access the temporary F-PLN, and revise it as necessary.

– PRESS the [6R] key to insert the temporary in the active F-PLN.

INSERTING A WAYPOINT

Waypoints can be inserted by means of a lateral revision at the "NEXT WAYPOINT". This process creates a temporary flight plan. This method enables the temporary flight plan to be checked before it is inserted.

WAYPOINT IDENTIFICATION

The pilot can identify a waypoint by :
- Its identifier (if it is in the navigation database).
- A Latitude/Longitude (LL).
- A Place/Bearing/Distance (PBD). The waypoint is defined by its bearing and distance from a place.
- A Place-Bearing/Place-Bearing (PBX). The waypoint is defined by the interception of 2 radials from 2 places.
- A Place/Distance (PD). The waypoint is defined by a distance from a place, along the F-PLN.

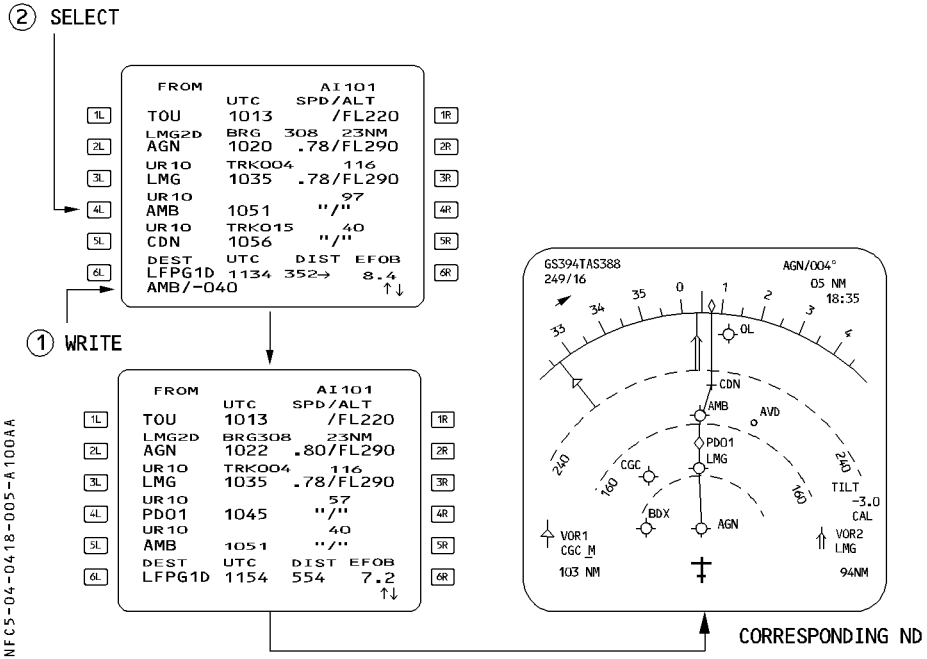
Note : If a slash or a dash is not entered properly, the MCDU displays a "FORMAT ERROR" message.

When the Flight Management Guidance System receives a pilot defined waypoint that is not in the database, it identifies it as LLxx, or PBD xx, or PBX xx, or PD xx (xx is a two-digit number between 01 and 20) and stores it in the stored waypoints file of the database.

Note : When NAV mode is engaged, the crew cannot modify the "TO" waypoint (active leg) using the waypoint insertion function. If the crew wants to modify it, the DIR TO function will be used.

ALONG TRACK OFFSET WAYPOINT INSERTION

On the F-PLN or STEP ALTS page, the pilot can enter an along track offset waypoint, defined as a place/distance waypoint. This results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN until the temporary F-PLN is inserted.



– **WRITE the waypoint identifier and the distance from this place.**
According to the sign of the distance, the crew may define an along track waypoint before or after the revised place (Example : AMB/-040).

– **PRESS the appropriate key adjacent to the place identifier. The system automatically positions the waypoint in the flight plan.**

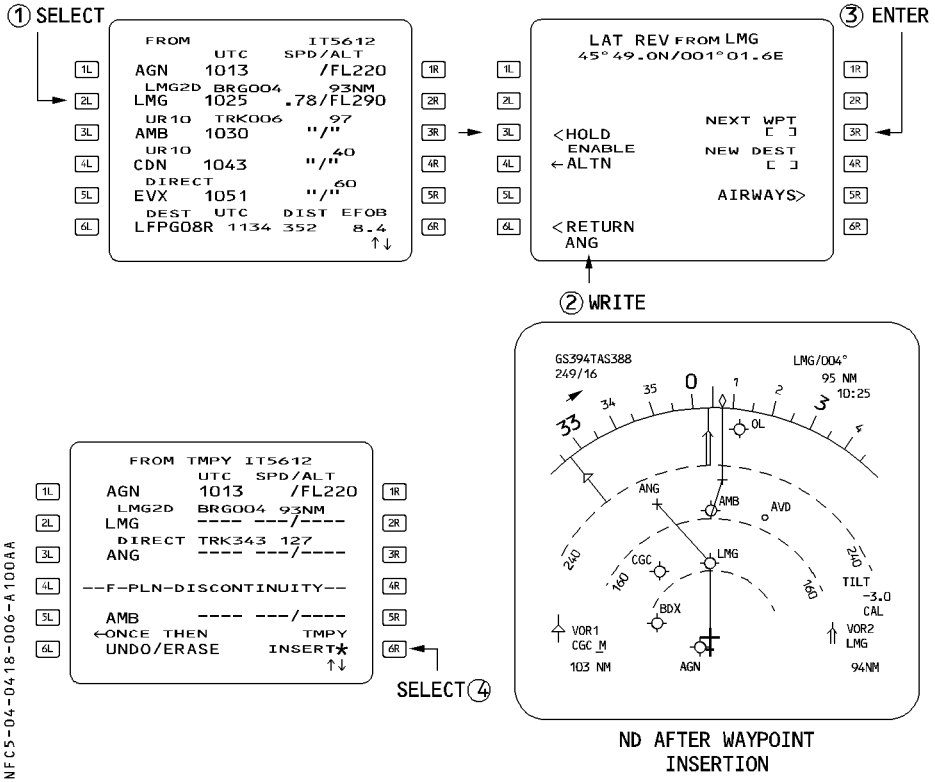
This operation does not create any discontinuity.
The system does not accept an along track waypoint entered at the FROM waypoint.

– **PRESS the [6L] key to access the temporary F-PLN. Revise as necessary.**

– **PRESS the [6R] key to insert the temporary into the active F-PLN.**

WAYPOINT INSERTED BY USING THE "NEXT WAYPOINT"

Use of the "NEXT WAYPOINT" function results in the creation of a temporary F-PLN. It has no effect on the active F-PLN, until the temporary F-PLN is inserted.



ND AFTER WAYPOINT INSERTION

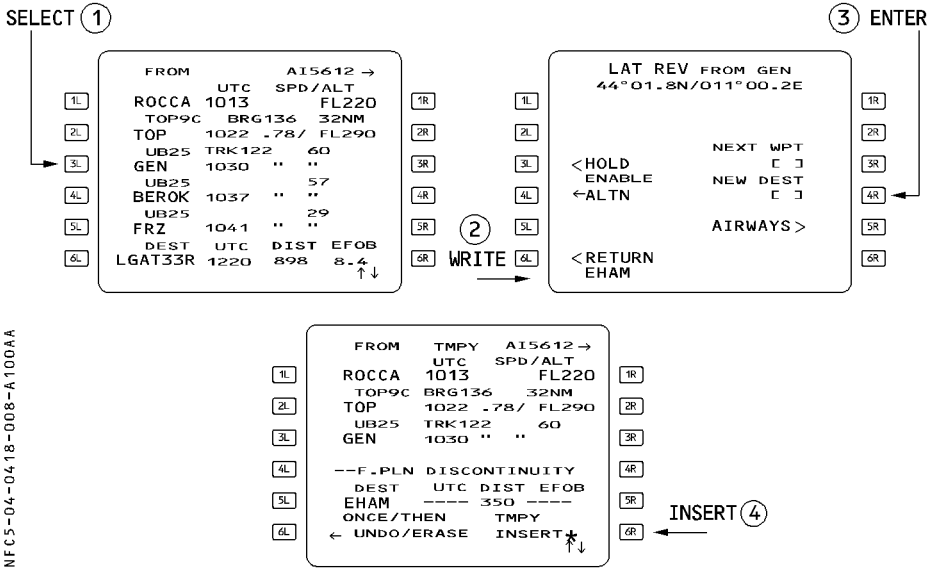
- **SELECT the lateral revision (LAT REV) function at an appropriate waypoint.**
- **WRITE the waypoint identifier, or LAT/LONG, or Place/Bearing/Distance, or Place-Bearing / Place-Bearing in the scratchpad.**
- **ENTER it in the brackets under the NEXT WPT (next waypoint). A temporary F-PLN is automatically displayed.**
- **CLEAR the F-PLN discontinuity, as appropriate, in the temporary F-PLN. Revise as necessary.**
- **PRESS the [6R] key to insert the temporary into the active F-PLN.**

INTENTIONALLY LEFT BLANK

INSERTING A NEW DESTINATION

The pilot may define a new destination, and insert it via the lateral revision page. This results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN, until the temporary F-PLN is inserted. The pilot may then call up the new destination from any waypoint along the flight plan, except the FROM waypoint, the destination, and the missed-approach waypoint. When the new destination has been inserted, a flight plan discontinuity appears between the revision waypoint and the new destination. All waypoints beyond the revision waypoint (including the previous destination and associated missed approach) are deleted.

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- **SELECT the lateral revision function at an appropriate waypoint.**
- **WRITE the new destination in the scratchpad.**
- **Enter it in the brackets under "NEW DEST". A temporary F-PLN is automatically displayed.**
- **CLEAR the F-PLN discontinuity in the temporary F-PLN. Revise as necessary.**
- **PRESS the [6R] key to insert the temporary into the active F-PLN.**

HOLDING PATTERN

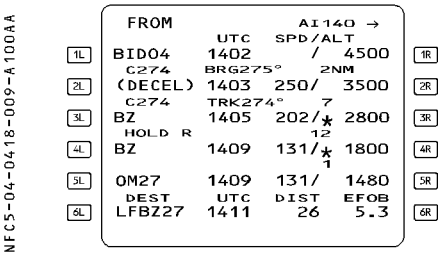
This section describes holding patterns, associated guidance and flight crew procedures. The Flight Management and Guidance Computer (FMGC) has three types of holding patterns that the pilot can use in a flight plan.

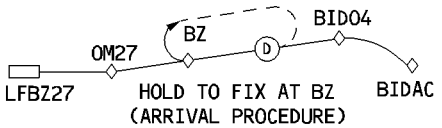
HOLD TO FIX (HF)

The holding pattern is always part of an arrival or departure procedure. The aircraft flies it once, and then automatically exits the holding pattern at the fix. The predicted speed in the holding pattern is the lowest of the ICAO speed limit, max endurance speed, or any speed constraint.

Guidance to the fix in the holding pattern is similar to that on any leg of a flight plan. The HF patterns are part of the navigation database and cannot be created by the crew.

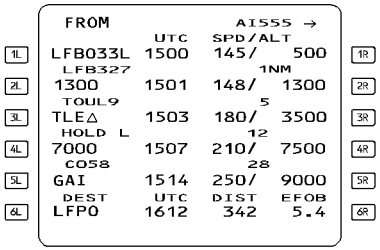
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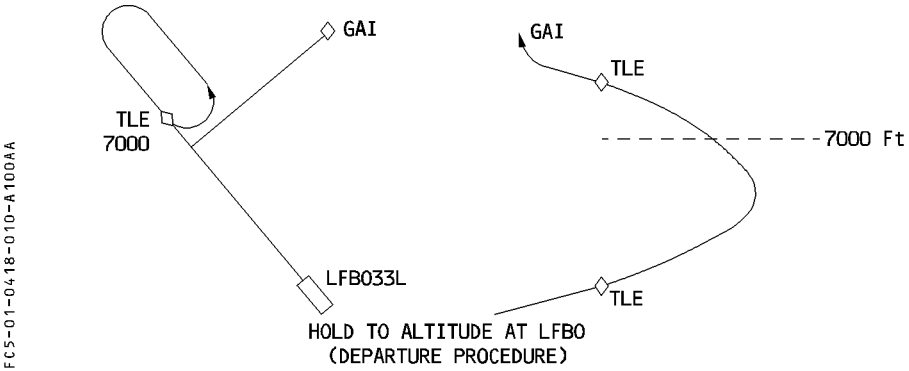




HOLD TO ALTITUDE (HA)

The aircraft flies the hold until it reaches the specified altitude. Then, it automatically exits the hold at the fix.
The predicted speed for the holding pattern is the lowest of the ICAO speed limits, the max endurance speed, or any speed constraint.
The size of the holding pattern is a function of the predicted speed.
Guidance in a hold to altitude (HA) is similar to that for any leg of a flight plan.
The HAs are in the navigation database, as part of the arrival or departure procedures, and cannot be created by the crew.





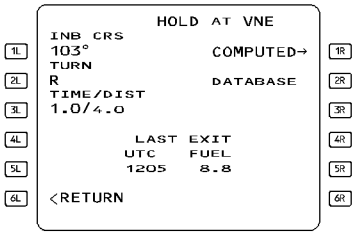
HOLD WITH MANUAL TERMINATION (HM)

This type of holding pattern may be part of an arrival procedure, or the pilot may enter it at the present position or at any flight plan waypoint.
The pilot will use this type of holding pattern to comply with a defined procedure or a clearance limit, or to meet an operational need (such as losing altitude, holding for weather improvement, or absorbing an ATC delay).
This type of holding pattern is exited according to the pilot's decision, not automatically.
There are 3 types of HMs, and all are modifiable.

DATABASE HOLD

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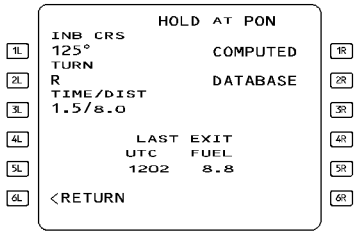


If the holding pattern is part of the database, all its associated data (inbound course, turn direction, time/distance) are defined in the database. The flight crew can modify this data, leading to the creation of a temporary F-PLN.

COMPUTED HOLD

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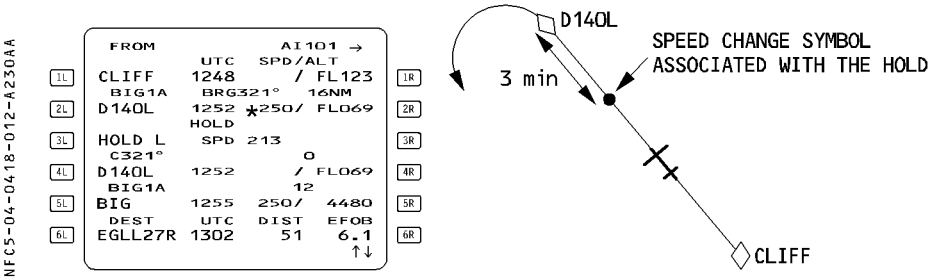
If the holding pattern is not in the database, the FMGC may design a holding pattern and proposes it to the pilot. The associated data consists of default values that the pilot can modify. This results in creating a temporary F-PLN.

PREDICTIONS AND GUIDANCE ASSOCIATED WITH A HM HOLDING PATTERN (HOLD WITH MANUAL TERMINATION)

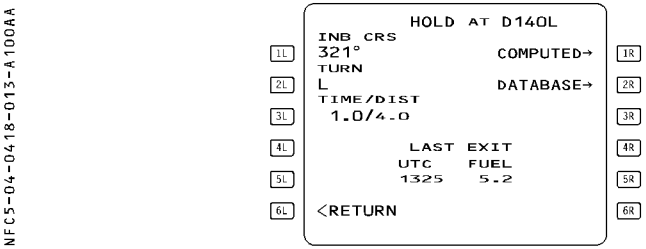
Before deceleration

Although the hold is inserted in the flight plan, the FMGS does not take it into account for predictions until the aircraft enters the hold.

However, if the hold is not deleted by the crew, the FMGS schedules a deceleration point and displays it on the ND.



Note : The deceleration point is located along the F-PLN, 3 minutes before the HM entry fix.



The FMGS predicts the estimated time and amount of fuel remaining at which the aircraft must exit holding, so as to comply with the fuel policy specified on the fuel prediction page.
When the aircraft enters the holding pattern, the FMGS revises all predictions and assumes the aircraft will fly one turn of the holding pattern.
All predictions are revised for one more the holding circuit at the holding fix overfly.

Upon reaching the speed change pseudo waypoint

The FMGS either causes the aircraft to decelerate to the hold speed (if managed speed is active and NAV mode engaged), or displays "SET HOLD SPD" (set hold speed) on the MCDU and primary flight display, if the flight crew had selected a speed target.
The default hold speed is the lowest of the :

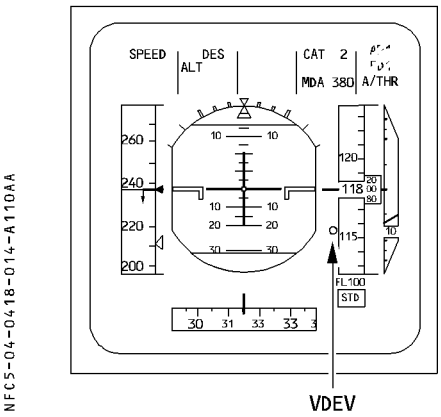
- Maximum endurance speed
- ICAO limit holding speed
- Speed constraint (if any).

R When no specific speed limit applies, the default hold speed is approximately equal to :

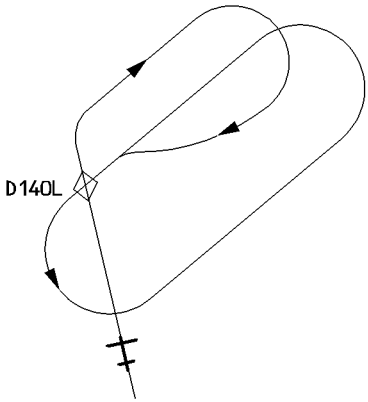
R - Green Dot speed on the A318, A319, A320 (CFM) and A321

R - Green Dot + 20 kts on the A320 (IAE).

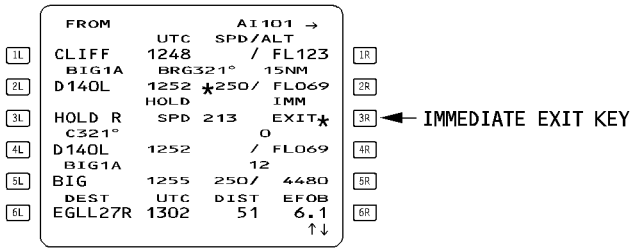
The flight plan predictions for time and fuel do not yet consider that the hold will be flown, however, the navigation display shows the hold entry and holding pattern trajectory.



NFCS-04-0418-014-A110AA



Deceleration receives priority, so that when the aircraft is in descent with the descent mode engaged, it will deviate above the descent path to decelerate. (VDEV becomes positive on the progress page).
The flight plan page displays an immediate exit prompt.
If the pilot presses the key next to "IMM EXIT", before arriving at the holding fix, the aircraft will not enter the holding pattern, but will resume its phase-related managed-speed profile.



NFCS-04-0418-014-B110AA

After reaching the hold entry fix

The aircraft enters the hold. The MCDU HOLD page displays the associated holding data :
- The inbound course (INB CRS),
- The TURN direction (L or R),
- The TIME/DIST,
- The LAST EXIT time and the associated fuel to reach the alternate airport with no extra fuel.

Note : The LAST EXIT time information is computed independently from the MIN DEST FOB value, and may give different results.

R The FMS assumes that the aircraft will fly one turn of the holding pattern, and revises the predictions accordingly.

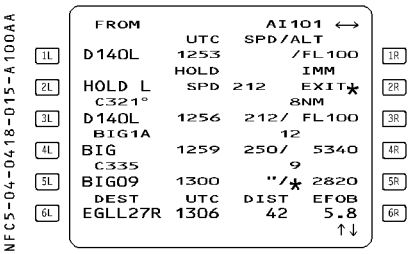
When the holding pattern is defined by a leg time (and not a leg distance), the system revises the size of the hold as a function of the target speed :

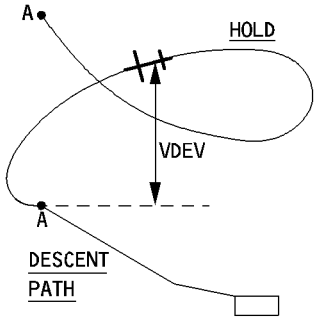
– If managed speed is active, the system uses the predicted holding speed to calculate the size of the holding pattern.

R – If the selected speed is active, the system uses the target speed selected by the flight crew at the entry fix sequencing to calculate the size of the holding pattern.

– The VDEV displayed on the primary flight display and the PROG page, when the aircraft is flying in the HM (hold pattern with manual termination), is the difference between the aircraft's current altitude, and the altitude at which it should be, when it reaches the hold exit fix in order to be correctly positioned on the descent path.

R



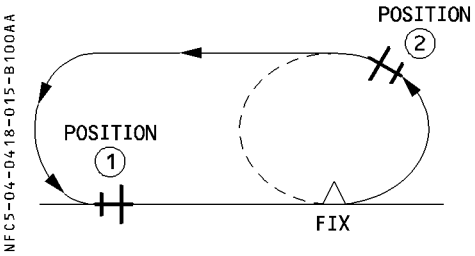


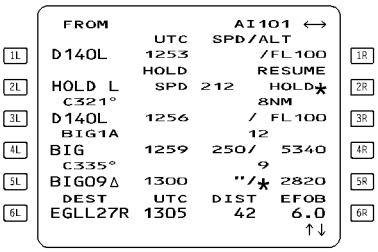
With IMM EXIT pressed (aircraft in the holding pattern)

The predictions and guidance assume that the aircraft is immediately returning to the hold fix.

Sequencing the hold fix, the aircraft exits the holding pattern and resumes its navigation. The flight plan page displays "RESUME HOLD*", instead of "IMM EXIT*".

R





HOLD EXIT PROCEDURE

– Position (1) If "IMM EXIT" pressed, the aircraft will exit at the next fix overfly.

– Position (2) If "IMM EXIT" pressed, the aircraft will make an immediate turn to the fix where the hold will be exited.

If managed speed is active, the computer sets the target speed to the applicable speed of the current phase (for example, speed constraint, ECON speed, or speed limit).
The computer then bases its predictions on the assumption that the flight will continue on the descent path, if the aircraft is in descent.
If DES mode is engaged, the following applies :

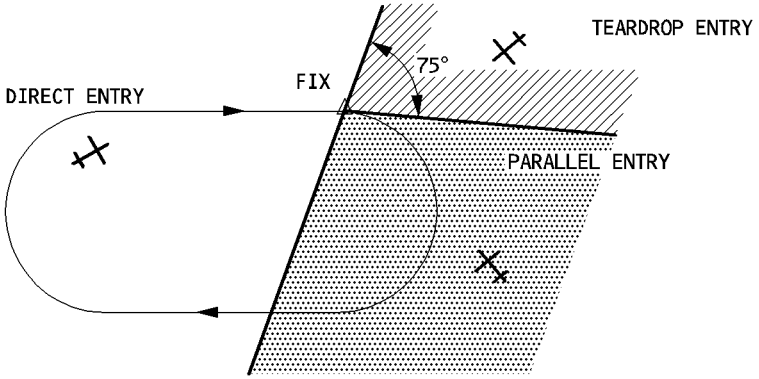
– The holding pattern is never included in the descent path computation.
– The flight crew cannot enter altitude and speed constraints at the hold exit fix. (This is only allowed at the hold entry fix).
– The vertical guidance in the HM, during the descent phase, calls for a constant –1 000 feet per minute. But the computer considers altitude constraints that will take effect farther down the flight path, as it calculates vertical guidance and predictions. The system will not allow the aircraft to descend below the next altitude constraint, neither to the FCU selected altitude. If the aircraft reaches the next altitude constraint, it will level off and the altitude constraint mode will engage.

With RESUME HOLD pressed

If the flight crew presses the key next to "RESUME HOLD", the aircraft remains in the holding pattern, and "IMM EXIT" is displayed again.
After that, each time the aircraft flies over the holding fix, the system updates the predictions for one more holding circuit.

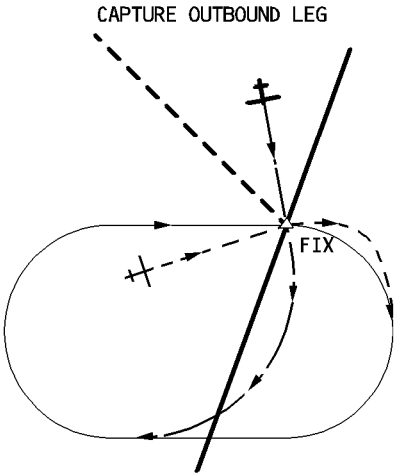
HOLDING PATTERN ENTRIES

The FMGS offers three types of entry into holding patterns :
1. Direct entry
2. Teardrop entry
3. Parallel entry



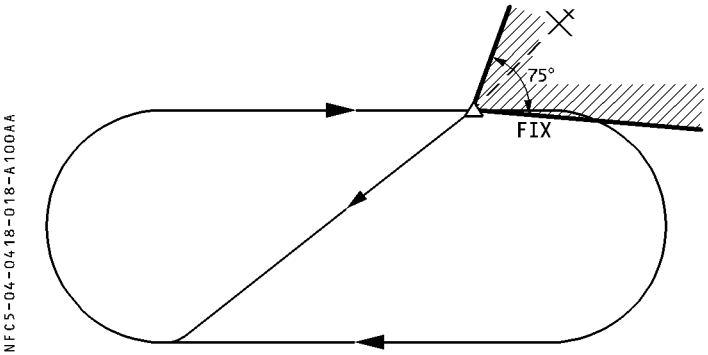
NFC5-04-0418-017-A100AA

1. The direct entry

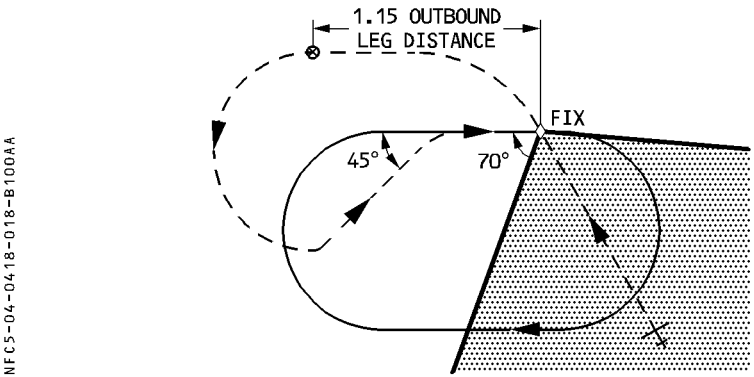


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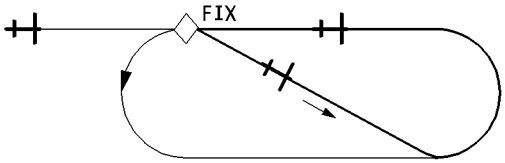
2. The teardrop entry



3. The parallel entry



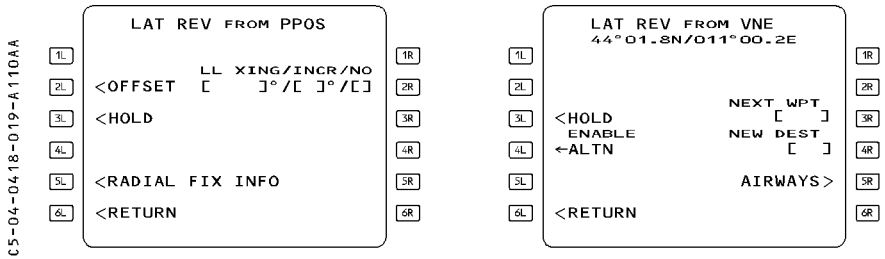
Note : If the leg the aircraft is flying toward the holding fix is on a "limit" between a teardrop entry and a parallel entry, the FMGC may compute and display either of the two entries. The pilot should keep this in mind, and should not assume that the FMGC is malfunctioning.
If the flight plan leg toward the hold entry fix is on a course that is the reciprocal of the inbound course of the holding pattern, the aircraft will fly a teardrop entry.



PROCEDURE TO INSERT A HOLD (HOLD WITH MANUAL TERMINATION)

The HOLD prompt enables the crew to enter a holding pattern, with manual termination (HM), at the revised waypoint or at the present position.
The crew accesses the HOLD page from a lateral revision at the present position (PPOS), or at a waypoint. Using the HOLD function results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN, until the temporary F-PLN is inserted.

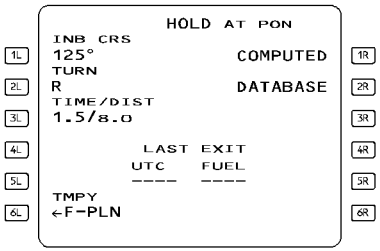
NFCS-04-0418-019-A110AA



LAT REV AT PRESENT POSITION — LAT REV AT A WPT

- **SELECT a lateral revision at the applicable waypoint, or at the present position (PPOS),**
- **PRESS the HOLD prompt [3L],**
- **SELECT COMPUTED [1R] or DATABASE [2R], as appropriate,**
- **CHECK, and if necessary, MODIFY the HOLD data,**
- **ACCESS the TMPY F-PLN [6L], REVISE it as necessary and INSERT it [6R].**

NFCS-04-0418-019-B110AA



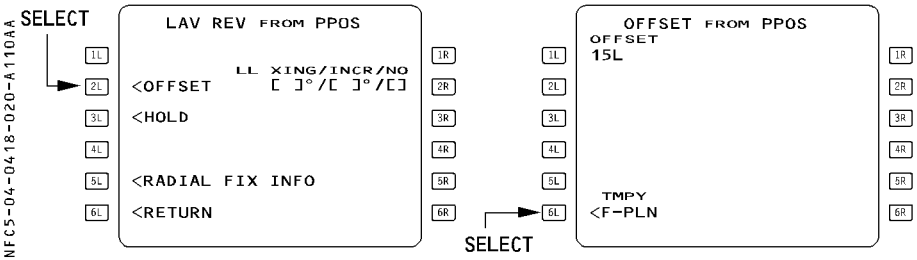
PROCEDURE TO DELETE A HOLD (HOLD WITH MANUAL TERMINATION)

- **CLEAR the HOLD directly in the flight plan, as can be done for a normal waypoint.**

OFFSET

The OFFSET prompt enables the crew to define a lateral offset to the left or right of the active flight plan. Once inserted, the offset applies from the present position (PPOS) all along the flight plan to the first waypoint (WPT) at which a holding pattern is defined, or to the last waypoint before the runway. In most cases, the crew will use it en-route, because of an ATC clearance, or to avoid bad weather expected along the flight plan route. Accessed from a lateral revision (LAT REV) at the present position page, an offset may be defined between 1 and 50 nautical miles in one-nautical-mile steps. Using the offset function results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN until the temporary is inserted. After inserting the offset in the flight plan, the flight plan page shows OFFSET in its title, and the navigation display shows the offset flight plan with a solid green line and the original flight plan with a dashed green line.
The offset is cleared :
– Automatically (holding pattern, approach), or
– Manually with the clear (CLR) key.

Note : If the crew enters an OFFSET when the aircraft is too close to the TO waypoint, the FMGS may refuse to accept it, in which case the MCDU displays the "ENTRY OUT OF RANGE" message.



INSERTING AN OFFSET

– SELECT LAT REV at the present position (PPOS).

– SELECT the OFFSET prompt.

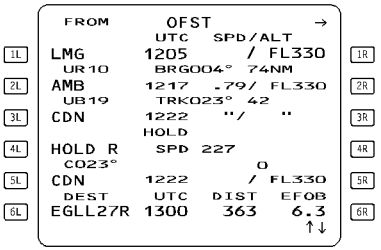
– WRITE the required offset value and direction (Example : L15 or 15L).

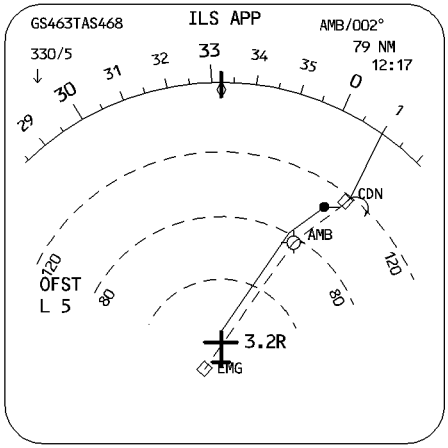
– PRESS [1L] to enter the offset in the OFFSET field.

– ACCESS the temporary F-PLN by pressing the [6L] key. Revise as necessary.

– PRESS [6R] key to insert the temporary into the active F-PLN.

NFC5-04-0418-021-A100AA





MANUAL CANCELLATION OF AN OFFSET

There are two standard methods of cancelling an offset :

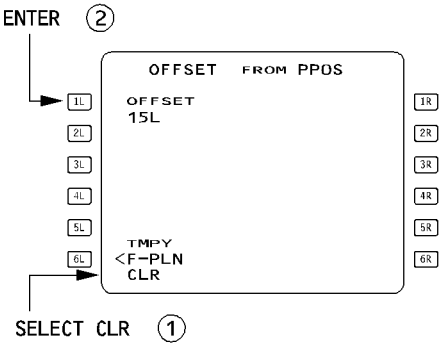
- **1. SELECT DIR TO a waypoint (the next waypoint, for example).**
- **2. SELECT a Lateral Revision (LAT REV) at FROM WPT.**

  – SELECT the OFFSET prompt.

  – CLEAR the OFFSET field (or ENTER a zero value in the OFFSET field).

  – PRESS [6R] to access the temporary flight plan (cancelling OFFSET).

NFC5-04-0418-021-B100AA



ALTERNATE FUNCTION

The ALTERNATE FUNCTION performs two actions :
– It reviews and defines alternate airports and inserts them into the flight plan.
– It allows a diversion to be activated through the ENABLE ALTN command.
Using the ALTERNATE function results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN until the temporary is inserted.

REVIEW AND SELECTION OF ALTERNATE AIRPORT

Several alternate airfields may be stored in the database and assigned to a destination. When the pilot selects a company route (CO RTE) (or a city pair), the computer strings the preferred alternate into the active flight plan.
The pilot may review the alternate airports on the ALTN page and, if the one selected is not suitable because of weather or fuel considerations, another alternate may be strung into the active flight plan.
The pilot may define an additional alternate airport into the list, if necessary.
The ALTERNATE page shows the track and distance (airway or direct) between destination and alternate, as well as fuel management data (EXTRA fuel, assuming the associated airfield is the alternate airport). This data will help the pilot change the preferred alternate, if necessary.
Access the ALTERNATE page through the ALTN prompt on the LAT REV page at destination. Alternate airfields are attached to the destination.

ENTERING NEW ALTERNATE INTO THE F-PLN

If the preferred alternate is unsuitable, proceed as follows :

– SELECT F-PLN key on the MCDU.

– SELECT LAT REV at destination.

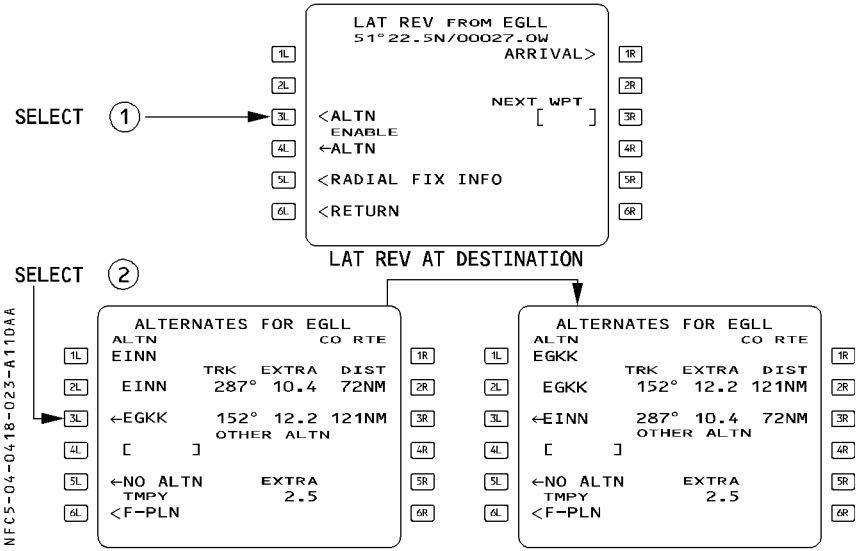
– SELECT ALTN [3L].

– SELECT an AIRFIELD IDENTIFIER.

– ACCESS the temporary F-PLN by pressing the [6L] key. Revise as necessary.

– INSERT the temporary flight plan.

Note : If weather and destination airfield conditions permit, you may select "NO ALTN". Fuel predictions will be computed without alternate fuel.



SELECTION OF ANOTHER ALTERNATE

Fuel management information for flight to another alternate airfield may be obtained by selecting the OTHER ALTN field.

– SELECT LAT REV at DESTINATION.

– SELECT ALTN [3L].

– ENTER the airfield identifier in the brackets.
- If the airfield is not in the database, the NEW RUNWAY page automatically appears.
- If the airfield is in the database and there is a company route (CO RTE) to it, the ROUTE SELECTION page automatically appears.

– SELECT the route, as appropriate, or RETURN to the ALTN page.

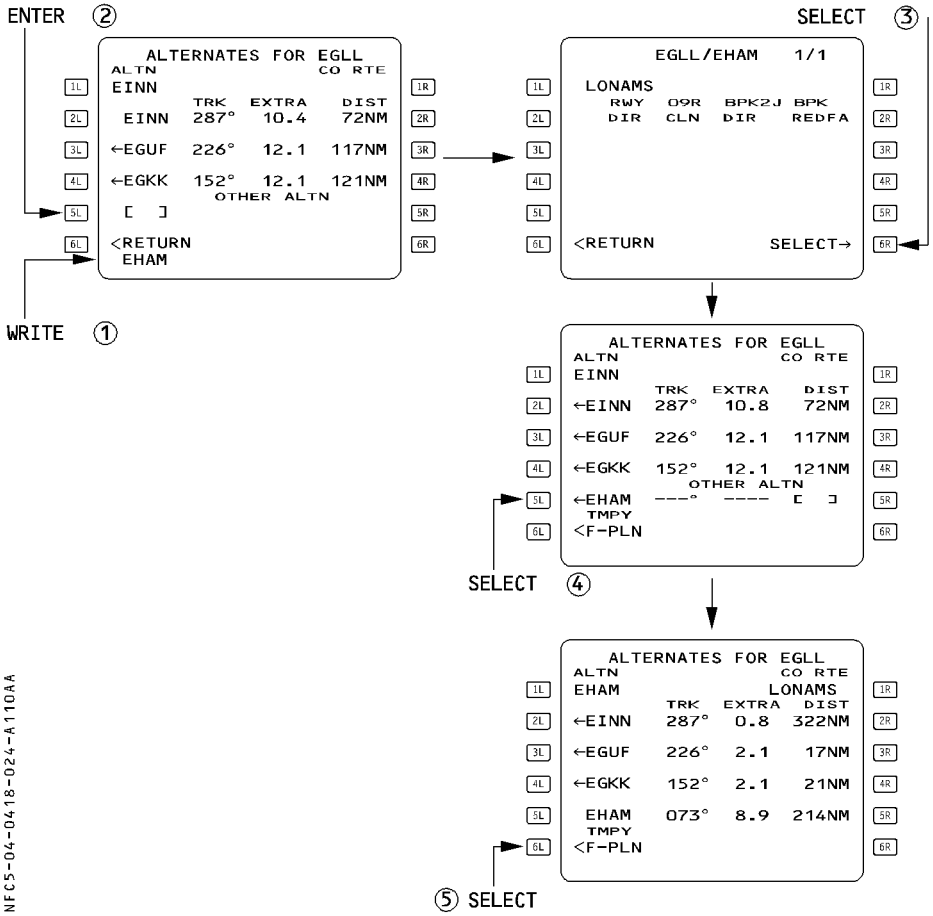
– ENTER the distance in the brackets (if required). XTRA fuel and track (TRK) will appear.

– SELECT the other alternate (OTHER ALTN) as a primary alternate, if convenient. (EXTRA fuel and DIST revert to AIRWAY distance).

– ACCESS the temporary F-PLN by pressing [6L] key. Revise as necessary.

– INSERT it, if you want to have it as a primary alternate.

Note : — *The pilot can always overwrite the "OTHER ALTN". The new "OTHER ALTN" then replaces the previous one, which is lost.*
— *The pilot can select OTHER ALTN as a primary alternate (active flight plan), to replace any alternate on the initial list.*
— *If the pilot selects the other alternate as a primary alternate, and overwrites the OTHER ALTN field by entering a new airport, the first one will remain a primary alternate and the system will memorize a second OTHER ALTN.*



The pilot may enter a distance in the OTHER ALTN field. The system will compute the extra fuel, and the track for this distance.
When the OTHER ALTN is selected as a primary alternate, the FMGC will also compute the predictions for the other alternate.

PREDICTED DATA FOR ALTERNATE

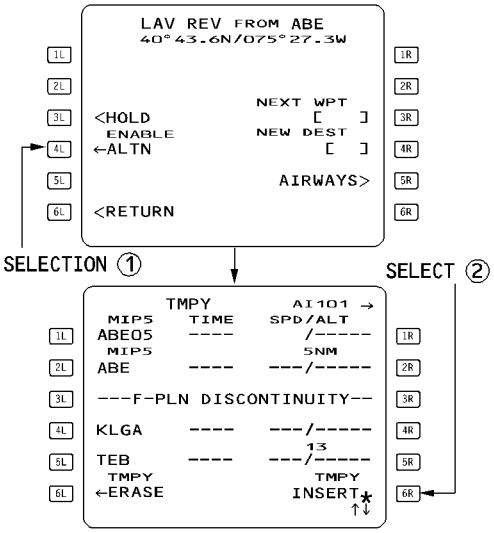
Data predictions are based on :

* Aircraft weight being equal to landing weight at the primary destination.
* Flight at flight level 220, if the airway distance is less than 200 NM. Otherwise, at flight level 310.
* Cost index 0.
* Constant wind (as entered in the alternate field of the DES WIND page).
* Constant delta ISA (equal to delta ISA at primary destination).

R * The distance along the flight plan, from the destination to the alternate airport (including
R the missed approach procedure, if any).

ENABLE ALTN

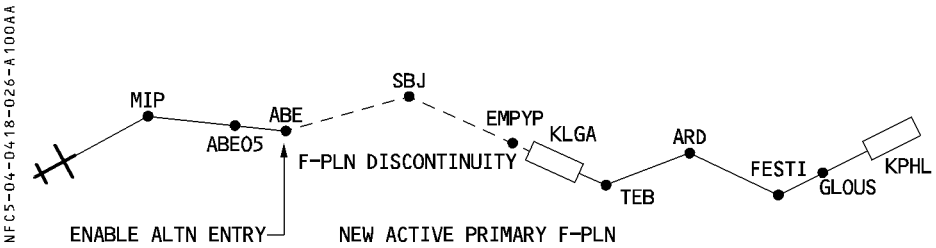
This enables the flight crew to initiate a diversion by entering the alternate flight plan just after the revision waypoint (with a discontinuity). Using the ENABLE ALTN function results in the creation of a temporary F-PLN. This function has no effect on the active F-PLN until the temporary F-PLN is inserted.
The flight crew may have to adjust the resulting flight plan (add or delete waypoints), depending on the circumstances.



NFC5-04-0418-025-A100AA

TO ACTIVATE THE PRIMARY ALTN :

- **SELECT a LAT REV at the "TO" waypoint (or at another suitable waypoint).**
- **PRESS the ENABLE ALTN key.**
- **ACCESS the temporary flight plan.**
- **CLEAR the discontinuity and revise the temporary F-PLN as necessary.**
- **INSERT the temporary F-PLN.**
- **ADJUST the cost index on the PERF page and the defaulted cruise flight level (CRZ FL) on the PROG page, as required.**



When ENABLE ALT is pressed at ABE, a flight plan discontinuity is created from ABE down to destination and the alternate route is linked to the active flight plan.

DIR KEY (DIRECT-TO-FUNCTION)

The pilot uses the "Direct To" function to define a direct leg from the present position to any waypoint on the active flight plan or to any waypoint.
The designated waypoint may be entered by its identifier (if it is stored in the navigation database), or as a pilot defined element, or by a latitude/longitude, place/bearing/distance, a place-bearing/place-bearing, or a place distance (PD) along the F-PLN.

Note : If the autopilot or flight director is in the heading/track or localizer mode, the "DIR TO" function engages the NAV mode.

Three functions are available through the DIR TO key :
- DIR TO defines a direct leg from the present position to a specified waypoint.
  NAV mode simultaneously engages upon DIR TO selection.
  When the pilot uses DIR TO, the present position (PPOS) becomes the "FROM" waypoint and the active flight plan shows it as the T-P (turn point).
- The DIR TO/ABEAM function, defines the abeam waypoints along the direct leg. These waypoints are the projection on the direct leg of the initial F-PLN waypoints, located between the aircraft position and the specified waypoint.
  NAV mode simultaneously engages upon DIR TO/ABEAM selection.
- The DIR TO/INTCPT function allows the definition of a specified RADIAL INBOUND or OUTBOUND at an inserted waypoint. The current aircraft track is used to compute the INTCPT point with the specified radial.
  NAV mode is simultaneously armed upon DIR TO/INTCPT selection.

If the DIR TO waypoint is part of the F-PLN, the FMS computes and proposes a default "Radial in", except if the DIR TO waypoint is preceeded by a F-PLN discontinuity.
The ND displays the DIR TO leg as a temporary flight plan leg, between the current aircraft position and a specified waypoint. In case of a DIR TO/INTCPT, the leg is not displayed when the angle between the current aircraft track and the intercept radial exceeds 160°.

Note : As soon as a designated waypoint is entered or selected, the DIRECT TO or DIRECT-TO-WITH ABEAM POINTS function is selected by default, and displayed (in yellow), depending on the Airline option on the AMI file.
The following examples assume that the activated AMI default option is the "DIRECT TO" function.

PROCEDURE FOR DIR TO WAYPOINT

Case 1. The "TO" waypoint is in the flight plan

Example : DIR TO FRZ (with the AMI default DIRECT TO option activated)

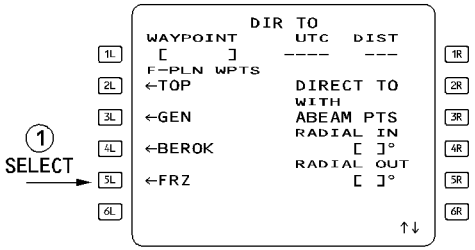
– PRESS the DIR key on the MCDU.

– PRESS the line select key next to "FRZ".

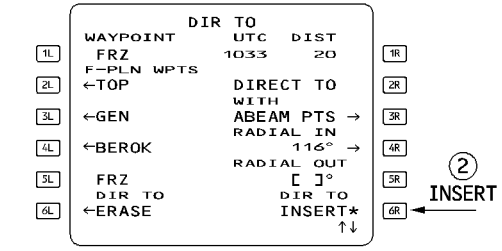
– CHECK that a temporary F-PLN is automatically displayed on both NDs.

– INSERT the DIR TO in the active F-PLN.

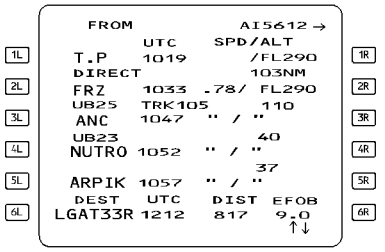
R

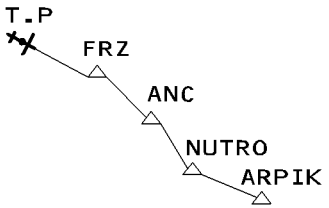


(in blue)



([1L],[1R] and [2R] fields in yellow)





RESULTING F-PLN AND ND DISPLAY

NFC5-04-0418-028-A100AA

Case 2. The "TO" waypoint does not belong to the flight plan :

Example : Direct to ABC (ABC being an ident, LL or PBD, PB/PB or a PD), with the AMI default DIRECT TO option activated.

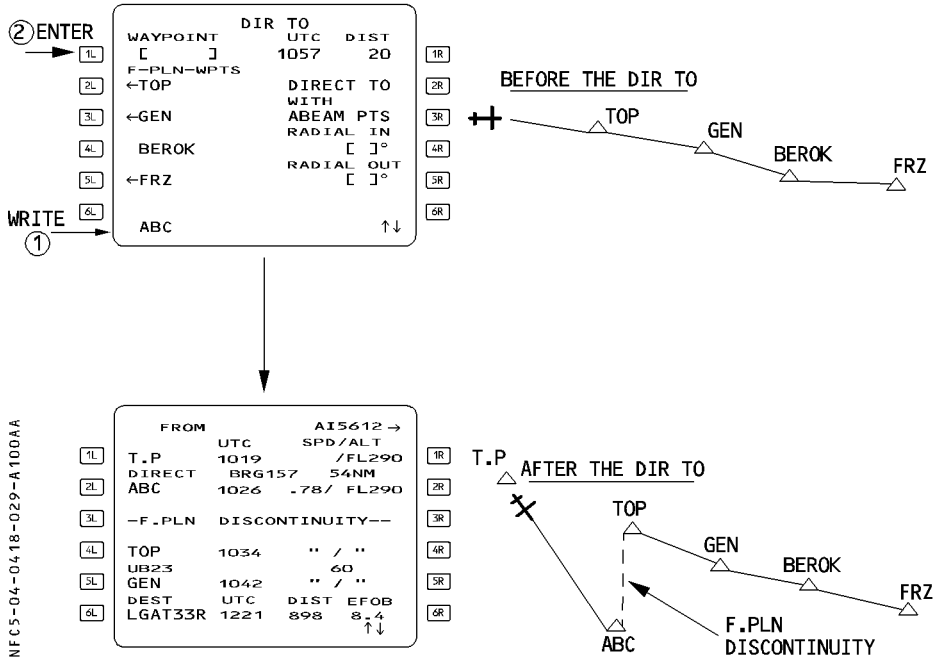
– PRESS the DIR key.

– WRITE the waypoint identifier (e.g. ABC) in the scratchpad.

– PRESS [1 L] to enter "ABC" in the "WAYPOINT" field.

– CHECK that a temporary F-PLN is automatically displayed on both NDs.

– INSERT the DIR TO in the active F-PLN.

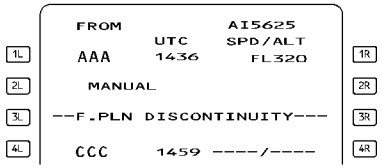


Clear the discontinuity and the waypoints that are not included in the new flight plan.

PARTICULAR CASES FOR USE OF DIR TO

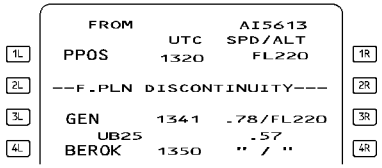
– If the pilot is flying a manual leg (part of a SID or STAR), the flight plan page displays "F-PLN DISCONTINUITY", preceded by "MANUAL" (see below).
These legs are specific heading or track legs flown with no defined end waypoint.

NFC5-04-0418-030-A100AA



– When the pilot encounters a flight plan discontinuity, or if a major reset occurs, the flight plan page displays "PPOS – F-PLN DISCONTINUITY", and the pilot looses managed guidance in both the lateral and vertical plans.
The autopilot or flight director reverts to the basic HDG V/S (or TRK FPA) modes. Predictions remain available and are based on the assumption that the aircraft will fly a direct leg from its present position to the next waypoint.

NFC5-04-0418-030-B100AA



– **In both of these cases, the only way to get back to a standard flight plan is to perform a "DIR TO" to a designated waypoint.**
– Following a DIR TO, the "MAP PARTLY DISPLAYED" message may appear on the NDs, if the new flight plan includes a very long leg. (Refer to the description in 1.31.45). When this message comes up, enter an intermediate waypoint to shorten the leg.
– If another lateral or vertical revision is attempted, while a DIR TO is pending, the MCDU message "DIR TO IN PROCESS" is displayed.

PROCEDURE FOR DIR TO/ABEAM

R Example : DIR TO/ABEAM to BEROK (with the AMI default DIRECT TO option activated).

– PRESS the DIR key on the MCDU.

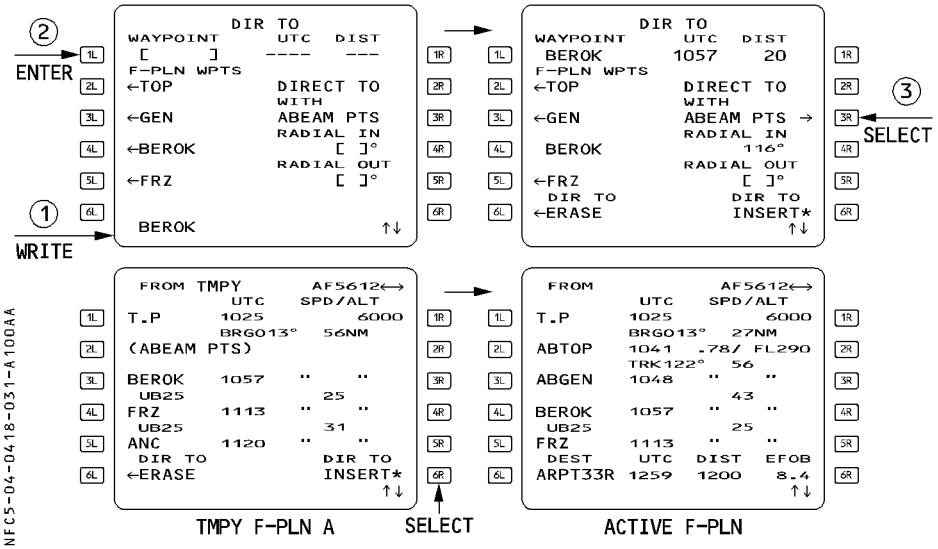
– WRITE the waypoint identifier in the scratchpad (Here : BEROK).

– PRESS [1 L] to enter the waypoint identifier in the WAYPOINT field.

R R **– SELECT the ABEAM PTS function, and CHECK that a TMPY F-PLN is displayed on both NDs.**

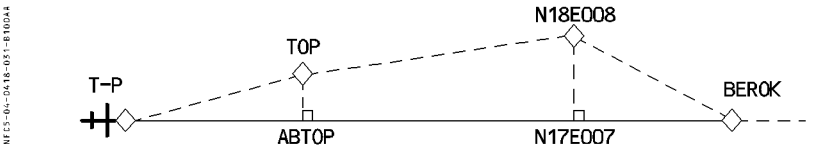
– INSERT the temporary F-PLN by pressing the [6R] key.

R



Note : 1. If, between the two waypoints projected on the direct leg, there was a discontinuity in the original flight plan, this discontinuity disappears between the corresponding abeam points on the direct leg.

2. If the pilot enters a latitude/longitude type reference waypoint, the system renames the abeam point with its recomputed coordinates (only in degrees).



PROCEDURE FOR DIR TO/INTERCEPT

– **PRESS the DIR key.**

– **WRITE the waypoint identifier in the scratchpad.**

– **PRESS [1L] to enter the waypoint in the WAYPOINT field.**
In the [4R] and [5R] fields, the MCDU displays the functions radial inbound and radial outbound from the waypoint.
If the waypoint belongs to the flight plan, the system displays the flight plan track as the default inbound radial.

– **WRITE the required in or out radial in the scratchpad, as necessary.**

– **PRESS [4R] or [5R] to enter the radial in the required field.**
The ND displays the temporary F-PLN. The pilot can still modify it :

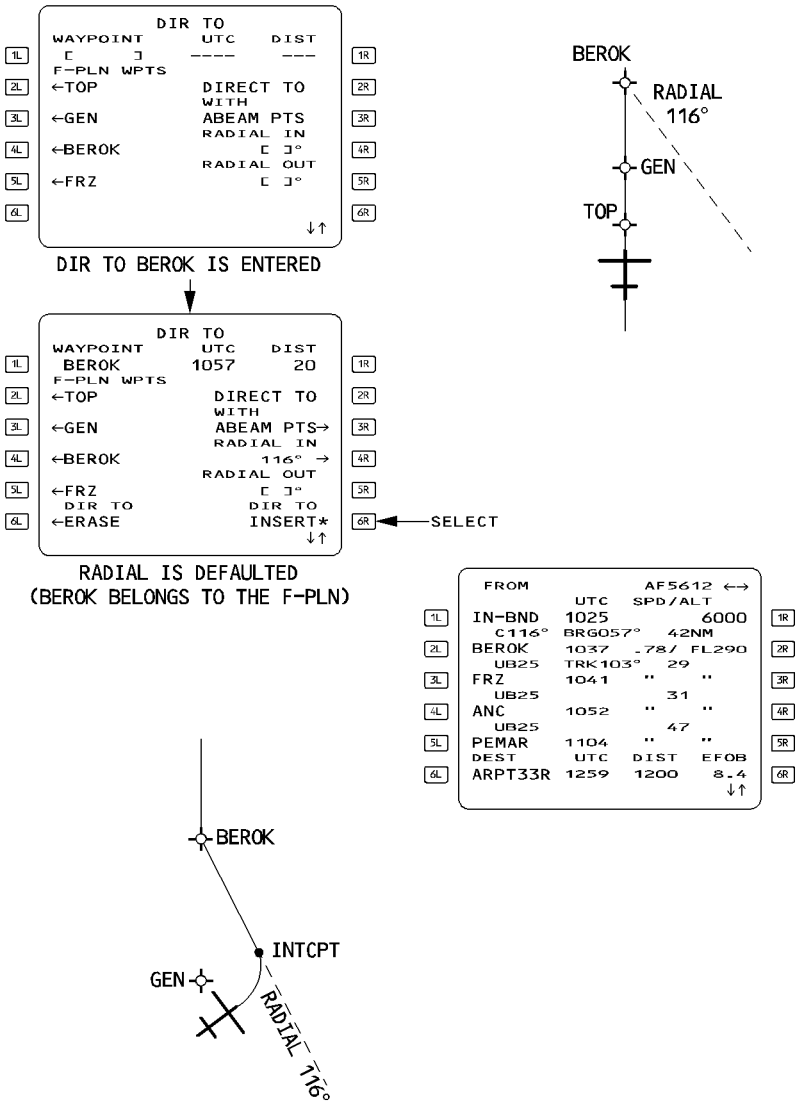
– **INSERT the DIR TO/INTERCEPT from the temporary into the active F-PLN by using the [6R] key.**

– **CLEAR the discontinuity, as necessary.**
The display reverts to the F-PLN A page, the system arms the NAV mode, and engages the HDG mode. The FROM waypoint is the aircraft position at the time of the DIR TO/INTERCEPT selection. The MCDU indicates it as INBND or OUTBND.

Note : 1. If the waypoint does not belong to the flight plan, the system strings the DIR TO/INTERCEPT leg to this waypoint, and inserts a discontinuity following the waypoint.
2. A DIR TO/INTERCEPT cancels any active offset.
3. If the current AP/FD lateral mode is HDG or TRK, NAV becomes armed.
If the NAV mode was engaged, NAV becomes armed. FCU HDG or TRK must be used to guide the aircraft.
The ND displays an intercept point, if the intercept angle is less than 160°. The system constantly updates it to reflect the current aircraft track and position with respect to the intercept radial. The NAV mode engages when reaching the intercept point.

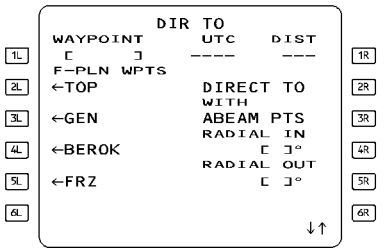
Example : RADIAL INBND
DIR TO BEROK - RADIAL 116° INBOUND

R

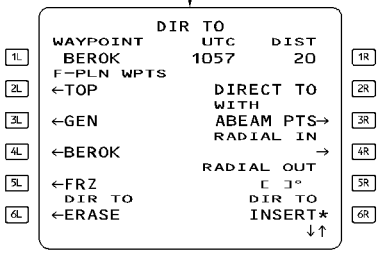


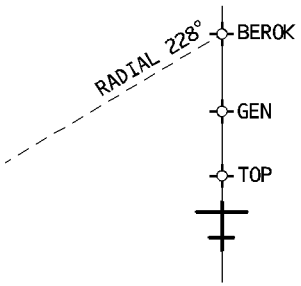
NFC5-04-0418-033-A100AA

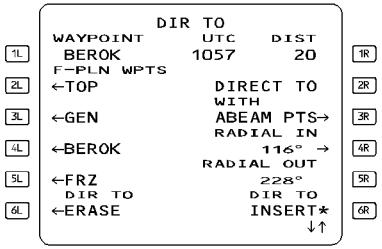
Example : RADIAL OUTBND
DIR TO BEROK - RADIAL 228° OUTBOUND



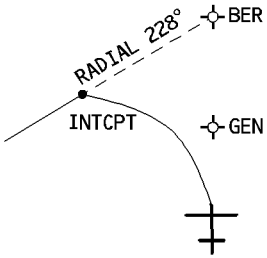
DIR TO BEROK IS ENTERED

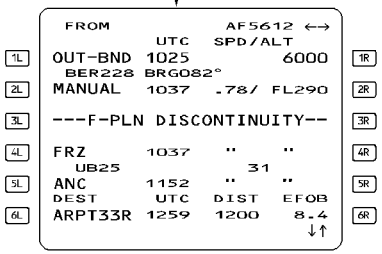






RADIAL OUT IS CONFIRMED





F-PLN A PAGE
OUT-BND BECOMES THE FROM WPT
AND IS FOLLOWED BY THE MANUAL TERMINATION

NFC5-04-0418-034-A100AA

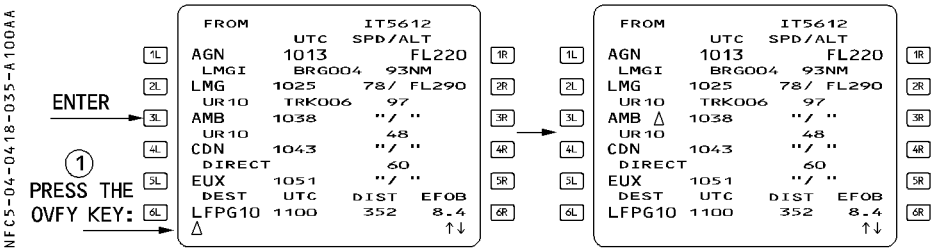
OVFY (OVERFLY) KEY

The overfly key programs the Flight Management Guidance Computer to fly over a specific waypoint or navaid. Using the overfly function results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN, until the temporary is inserted in the active F-PLN.

– **PRESS the "OVFY" key.**
A "△" appears in the scratchpad.

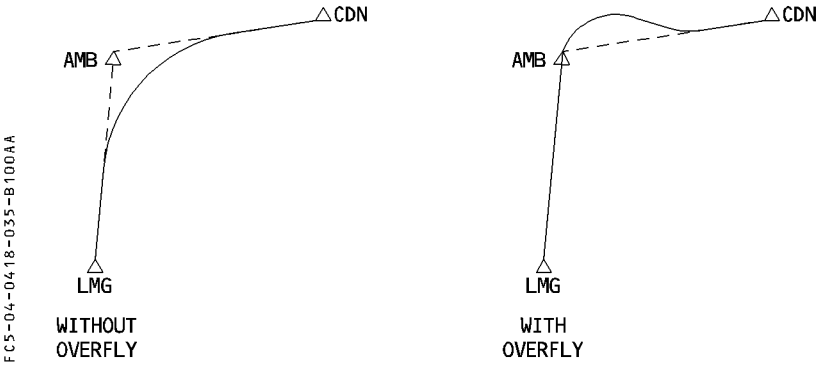
– **INSERT it, by pressing the key adjacent to the waypoint to be overflown. [3L], in this example.**

– **INSERT the temporary into the active F-PLN.**



NFC5-04-0418-035-A100AA

To cancel the overfly function, associated to a waypoint, press the OFFY △ "key again on the MCDU.

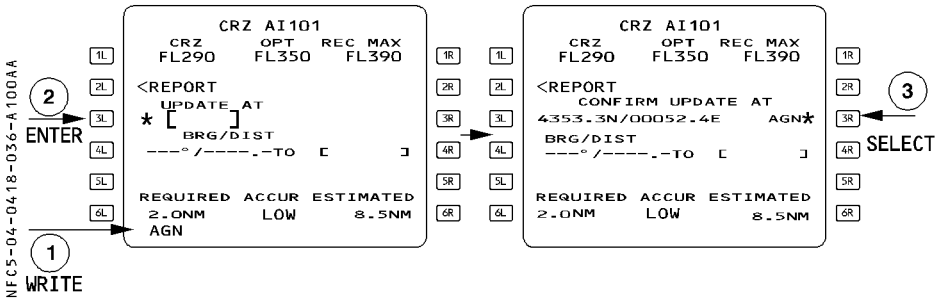


NFC5-04-0418-035-B100AA

The overfly function allows you to fly over a specific waypoint, and return the aircraft to the great circle track.

"UPDATE AT"

To manually change the position computed by the FMGC (FM position and bias), the pilot uses "UPDATE AT" on the progress page.
Use this function with extreme caution : It is apt to be inaccurate, because it relies on the pilot's estimation of when a designated position has been reached.



- **WRITE the ident for the navaid (or waypoint, or airport), or the coordinates, or the PBD PB/PB at which the update is intended.**

- **PRESS [3L] to enter the ident in the "UPDATE AT" field. The coordinates of the point, along with its identifier (or "ENTRY", if the identifier is not in the database), appear in that field.**

- **PRESS [3R] to activate the update, when you estimate that you are at the position.**

  Note : The system reinitializes the Estimated Position Error computation when a position update is performed. This may lead to the appearance of a "NAV ACCUR DOWNGRAD" or "NAV ACCUR UPGRAD" message.

If the "UPDATE AT" does not properly take effect, it corrupts the FM position.

- In an area with good radio navaid coverage :
  - If the update error is small, subsequent radio position updating will correct the FM position.
  - If the update error is large, the system will reject any radio updating because its internal "reasonableness test" will reject the various navaids. Thus, the FM position will only be the MIX IRS position corrected by the position bias, determined at the time of the update, and the error will be maintained.
- In an area without proper navaid coverage, radio position updating will not be available and the FM position, if incorrect, will remain incorrect until a new manual update is performed.
- Therefore, the pilot should only use "UPDATE AT" in case of a major position problem, such as :
  - On the ground, no flight plan appears on the navigation display and ARC/ROSE NAV mode is selected .
  - A "CHECK IRS/FM POSITION" message appears on the MCDU.
  - A "FM/IR POSITION DISAGREE" message appears on the ECAM.

When GPS PRIMARY is operative, the FM position will always converge towards the GPS position at a rate depending on the aircraft altitude. Therefore, when GPS PRIMARY is operative, an inaccurate "update at" will have a temporary effect on the FM position.

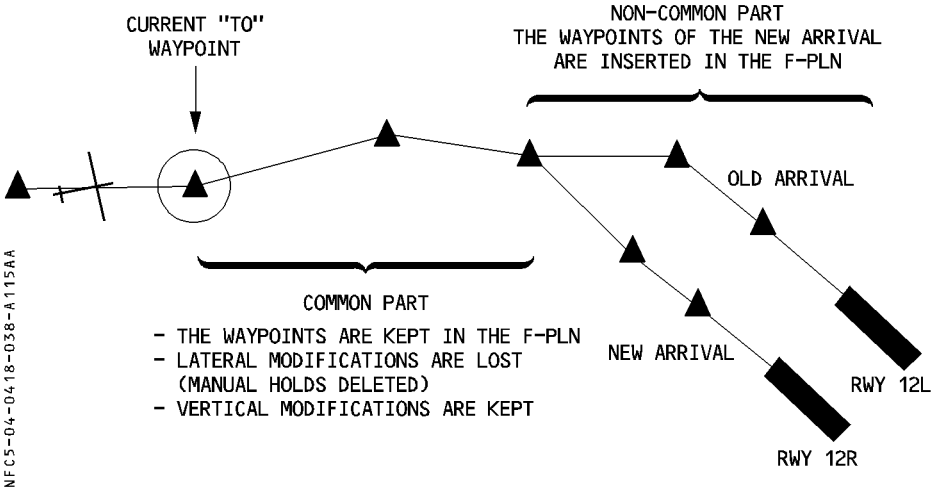
CHANGING THE DEPARTURE/ARRIVAL

Changing the arrival

In approach, the flight crew may be assigned a new arrival procedure or landing runway, while already flying the initially selected arrival. Usually, at that point, the aircraft will still be in a part of the arrival that is common to the old and new procedure. When the new arrival or runway is selected, the FMS strings the remaining part of the new procedure, after the current "TO" waypoint, (see picture below).

All the lateral pilot modifications (including Holds) made to the previous arrival procedure are erased. This includes modifications made to the "TO" waypoint. The vertical pilot modifications (such as speed/altitude constraints) are kept on the waypoints in the common part (including the "TO" waypoint).

If a hold had been inserted in the old arrival procedure, it is deleted and the MCDU displays the "MANUAL HOLD DELETED" message in the scratchpad.



The crew should check and revise the TMPY F-PLN, as necessary, prior to inserting the TMPY F-PLN in the active F-PLN.

If the current "TO" waypoint is not common to the old and new procedure

Then, the FMS stacks the current active leg, and the entire new arrival procedure as follows:

– The active "TO" waypoint is kept,
– A "F-PLN DISCONTINUITY" is inserted,
– The entire new procedure is strung after the discontinuity.

The crew should check and revise the TMPY F-PLN, as necessary, prior to inserting the TMPY F-PLN in the active F-PLN.

Note : Depending on the actual progress of the flight, the flight crew may choose the NO STAR and/or NO VIA options on the ARRIVAL page, in order to string only the final part of the approach in the F-PLN.

Changing the departure

If the flight crew changes the departure procedure, the FMS replaces the entire departure procedure by the new selected one.

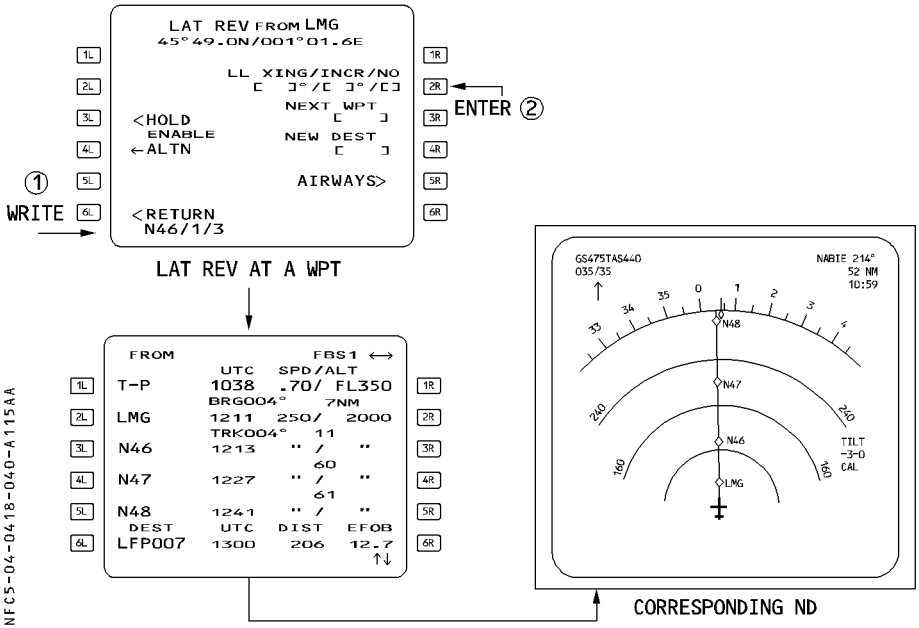
However, if a lateral modification had been performed within the initially selected departure procedure, the waypoints following the modified waypoint are considered as "en-route" waypoints by the FMS. When a new runway or a new departure is selected, these "en-route" waypoints are kept in the F-PLN, and inserted after the new selected departure.

Latitude/longitude crossing waypoint insertion

This function enables the crew to insert one or several points along the flight plan beyond the revised waypoint, at fixed latitude or longitude intervals (INCR), from a specified latitude or longitude.

These waypoints can be inserted in the F-PLN, and visualized on the corresponding ND.

They are not stored in the pilot-defined elements ; the system deletes them when sequenced.



– **WRITE the latitude (NXX or XXN, SXX or XXS) or longitude (EXX, XXE, WXX, XXW), the required increment in degrees between the successive waypoints, and the number of required waypoints.**
(Example : If the crew wants to obtain 3 points, at every degree of latitude from N46: Enter N46/1/3).

– **PRESS [2R] to insert it into the LL XING/INCR/NO field.**

– **PRESS [6R] to insert the new waypoints in the flight plan without discontinuity.**
The system does not store these waypoints in the database.

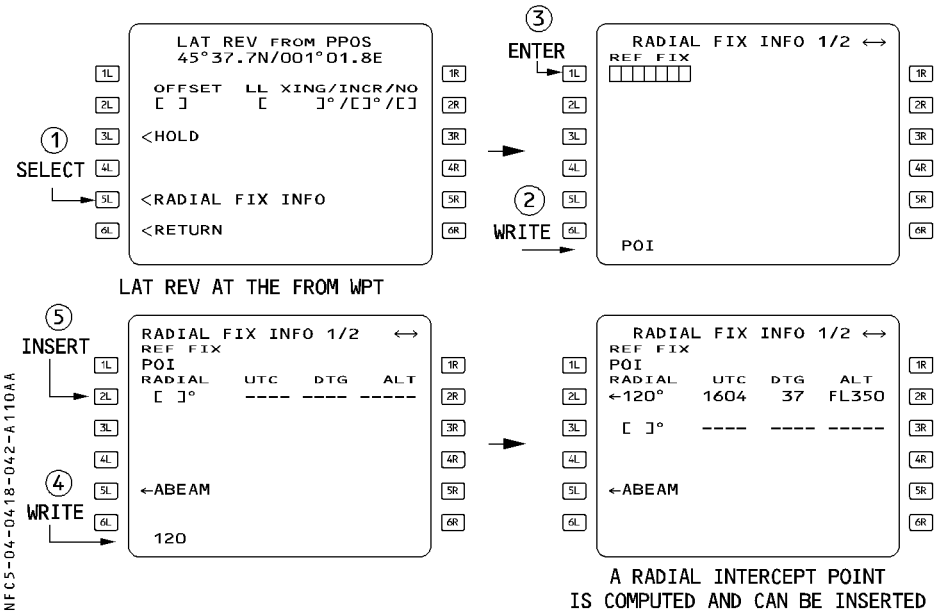
INTENTIONALLY LEFT BLANK

RADIAL FIX INFO

When using the RADIAL FIX INFO function, the pilot defines waypoint intersections of the flight plan with radials associated to a fix.
When the crew inserts the intersection point, the system automatically identifies this point, but does not store it in the navigation database.
RADIAL FIX INFO function offers 2 possible waypoint insertions : Radial intercept waypoint and abeam intercept waypoint.

INSERTING A RADIAL INTERCEPT WAYPOINT

The crew accesses the radial intercept function from the LAT REV page at the origin, at the "from" waypoint, or at the destination airport.

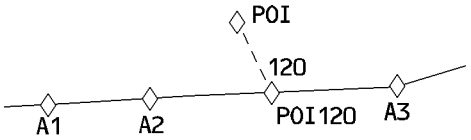


– **WRITE the reference fix identifier into the scratchpad. It may be any database or pilot-defined fix (here POI).**

– **PRESS [1L].**

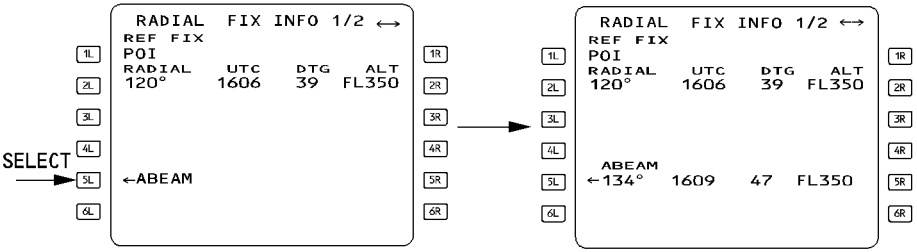
– **WRITE the radial in the scratchpad (here 120°), and ENTER it [2L].**
If the radial line intersects the active flight plan, the system computes the time, the along path Distance To Go (DTG), and the altitude at the intersection point.
Up to three radials can be entered.

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INSERTING AN ABEAM INTERCEPT WAYPOINT

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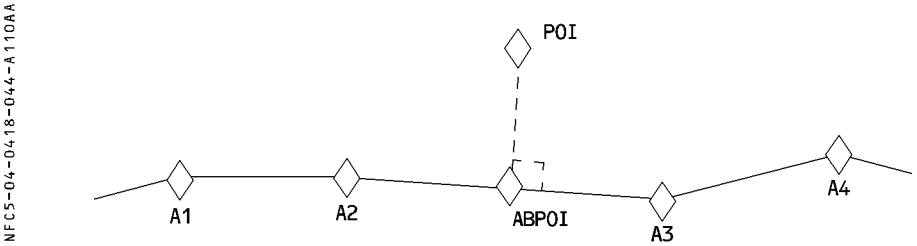
FIX INFO PAGE FOLLOWING REF FIX ENTRY

ABEAM INTCPT POINT IS COMPUTED AND INSERTABLE

– **WRITE the reference fix identifier into the scratchpad (here POI), and ENTER it [1L].**

– **SELECT the ABEAM prompt [5L] : The system computes the radial, time, distance to go, altitude and predictions related to the waypoint abeam the reference fix.**

– **SELECT [5L] to insert the abeam intercept waypoint into the flight plan : The system automatically assigns its identifier as AB, followed by the first five characters of the reference fix identifier (Example ABPOI).**

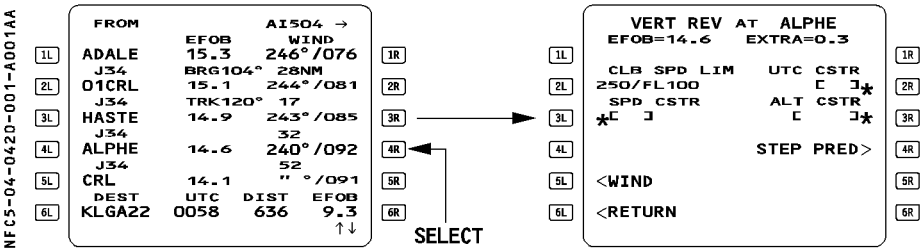


GENERAL

The vertical revision function allows the pilot to modify the following parts of the flight plan:

- Speed limit
- Speed and altitude constraints
- Wind
- Time constraint (optional)
- Step climb or step descent

The pilot selects these functions by pressing the right key on flight plan A or B.



Note : Chapter (4.04.20) only describes the 2 following functions, wind and time constraint.
For other vertical revision functions refer to next section (4.05).

TIME CONSTRAINT

A time constraint (TIME CSTR) is a time requirement to be met over a specified waypoint of the lateral flight plan, including destination but excluding the origin and FROM waypoints.

At most, two time constraints may exist : one in the active flight plan
one in the secondary flight plan.

When a second time constraint is entered in a flight plan, the first one is deleted.

The time constraint entry is not allowed in Engine Out mode or once the aircraft is in descent or approach phase or go around.

A time constraint is displayed in magenta as long as the predictions are not computed.

Once the predictions are available, the time constraint value is replaced by the predicted time at the related waypoint, highlighted by a star (*) :

– if the TIME CSTR is predicted as matched, the star (*) is magenta
– if the TIME CSTR is predicted as missed, the star (*) is amber.

No specific symbol is provided on the ND.

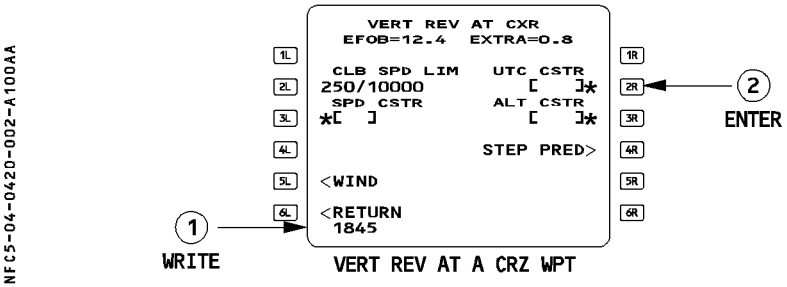
A time constraint is cleared as any other constraints. If a time constraint is automatically deleted, a "TIME CSTR DELETED" message is displayed on MCDU.

TIME CSTR entry

– **SELECT the F-PLN Key on MCDU**

– **SELECT a VERT REV at revised WPT**

– **WRITE the TIME CSTR into the scratchpad then ENTER it**
The display automatically reverts to the F-PLN A page.



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WIND

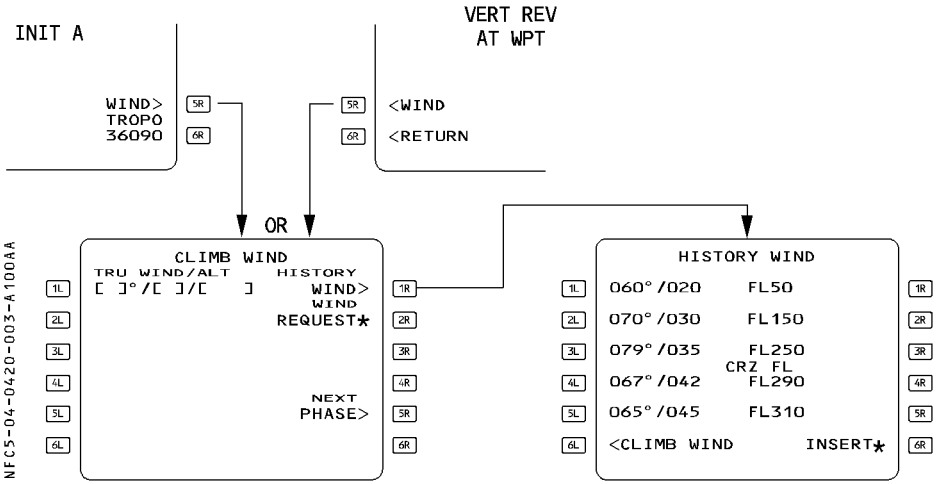
In order to receive the best predictions, the pilot must enter wind values for the different phases and for various waypoints of cruise phase.

ENTERING THE CLIMB WINDS (F-PLN INITIALIZATION)

When completing the INIT A page, the pilot will enter the winds by depressing the WIND prompt. He will access the different wind pages using NEXT PHASE key and PREV PHASE key. He will slew the CRZ WIND page to access the various waypoints of the cruise winds. The pilot will enter wind data as follows :

- for CLB phase ; by inserting either the HISTORY WIND data (as recorded during the last descent) or by inserting winds (at up to 5 altitudes) on the CLB WIND page.
- for CRZ phase ; by inserting winds at various CRZ waypoints on the CRZ WIND pages.
- for DES phase ; by inserting winds (at up to 5 altitudes) on the DES WIND page
- for the ALTN F-PLN, an average wind may be entered on the DES WIND page for alternate cruise flight level.

Note :
- *Cruise wind and alternate wind prompts are not displayed on the FUEL PRED page with this standard.*
- *Wind can be automatically received (and inserted) through ACARS system (Refer to 4.04.40)*
- *Once inserted, the F-PLN B page displays the forecast wind profile at all waypoints using interpolated values from manual entries.*



WIND ENTRY RULES

When from an empty field, a wind entry is performed, direction/velocity/altitude (or flight level) must be entered simultaneously. One entry in each bracket.
Overwriting a wind cancels the previous one.
Wind data can be cleared, the field reverts to brackets.
All winds except the PERF APPR page wind (Tower wind) are true north referenced.

ENTERING THE HISTORY WIND (F-PLN INITIALIZATION)

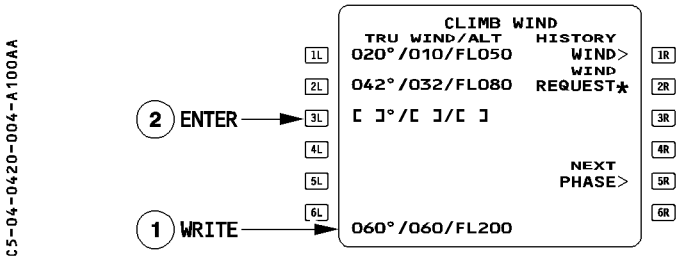
The pilot may insert the history wind but cannot modify this page.
If convenient, PRESS the (6R) prompt to insert. After insertion, the [6R] prompt is suppressed but the page still displays the wind values for information.

ENTERING THE CLIMB WIND (F-PLN INITIALIZATION)

If previous history winds are not convenient or have to be modified :

- **SELECT CLIMB WIND page from INIT A page or VERT REV page.**

- **WRITE new winds into the scratchpad and ENTER**



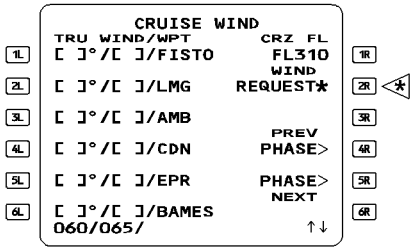
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CLIMB WIND cannot be modified when the climb phase is active.
At climb phase transition, wind data switch from blue to green colour and any attempted modification will trigger the “NOT ALLOWED” message.
The system interpolates winds between 2 entered levels.

ENTERING THE CRUISE WINDS

At flight plan initialization the cruise wind page displays all cruise waypoints with empty brackets. In flight, only down path waypoints are displayed.

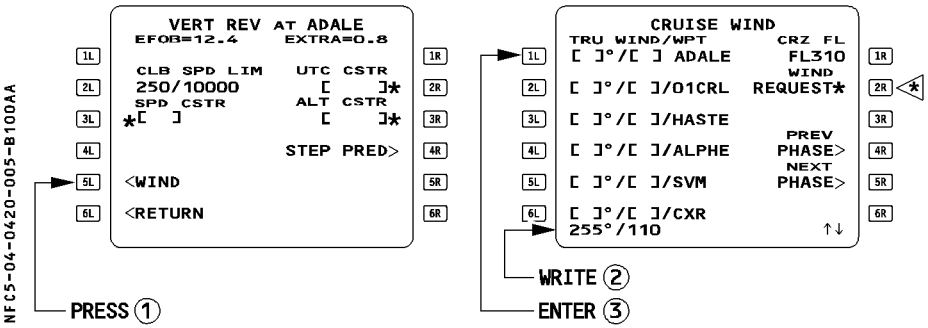
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CRUISE WIND PAGE AT F-PLN INITIALIZATION

- **SELECT VERT REV at WPT**
- **PRESS the WIND prompt**
- **(If necessary) SELECT NEXT PAGE**
- **SLEW until relevant waypoint is displayed.**
- **WRITE and ENTER the new wind data into the scratchpad.**
  WIND may be entered through ACARS pages system. (Refer to 4.04.40)

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The crew will modify the entered winds in flight if a significant difference is expected (greater than 30 kt or 30°).

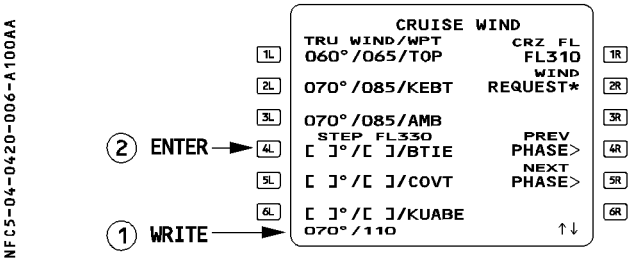
Note : – *Cruise wind may be entered directly into F-PLN B page. These entries are automatically transferred to cruise wind page.*
– *The CRUISE WIND page displays only ACARS or crew entered data. It never displays computed or propagated data (F-PLN B page only).*

ENTERING A STEP CLIMB/STEP DESCENT WIND

If a step climb or a step descent is scheduled, the wind at the step level shall be entered for prediction purposes.

– **SELECT CRUISE WIND page.**
Slew until the step waypoint is displayed.

– **WRITE the wind into the scratchpad and ENTER.**



If the pilot does not enter the step wind, the FMGS continues to use the wind entered for the cruise flight level.
Clearing the manual entry reverts to brackets, but the FMGS will use the wind at cruise flight level for predictions and performance.

ENTERING THE DESCENT WINDS

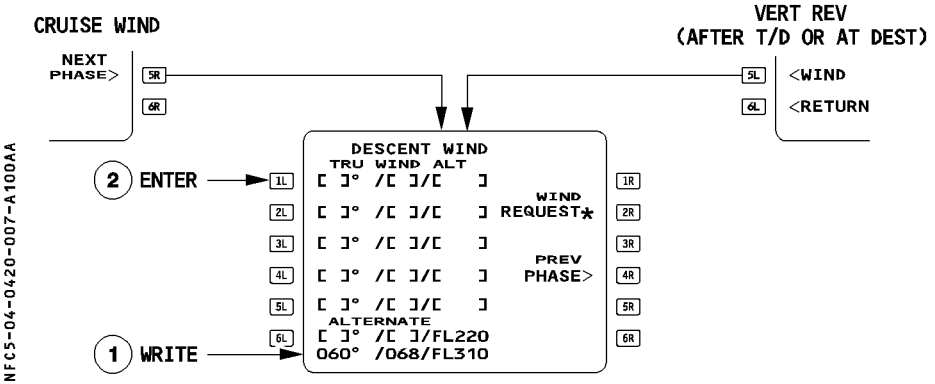
The pilot will enter as many as one wind at 5 different FL or altitudes. This wind data will be used for descent profile and prediction computation.
From the vertical revision page or from the CRUISE WIND page :

– **PRESS the WIND prompt.**

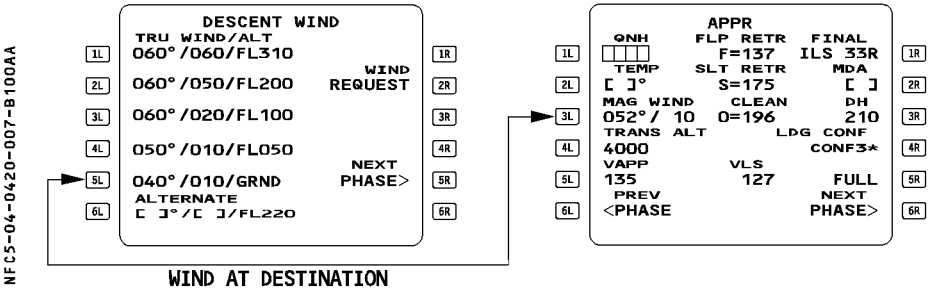
– **SELECT the DESCENT WIND page.**

– **ENTER up to 5 different "wind/altitude".**

R *Note : It is recommended that at least one descent wind be entered at cruise FL.*
R *If no wind is entered, the system will assume a zero wind value (displayed on*
R *F-PLN B page) at TOD.*



A wind is written as true direction/velocity/flight level or altitude in feet.
If the crew enters "GRND" in the altitude field, the system uses the associated wind as wind at destination.
The descent profile is corrected as well as the tower wind entered in the PERF APPR page. (The wind direction is then modified of the magnetic variation).



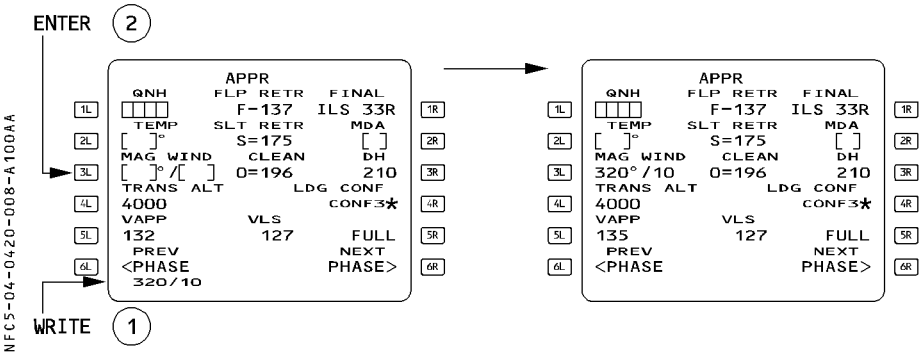
When the winds have been entered, the F-PLN B page displays the forecast wind profile at all descent waypoints using values it has interpolated from manual entries. Descent winds are not modifiable when descent, approach or go around phase is active. At descent phase transition, wind data switch from blue to green colour and any attempted modification triggers the "NOT ALLOWED" message.

ENTERING THE ALTERNATE WIND

R Alternate wind is entered on the DESCENT WIND page. If an ALTN wind is not defined, the
R predictions are computed with a wind defaulted to zero. Alternate wind can be modified at
R any time. In addition, the alternate cruise (ALTN CRZ) level defaults to :
R — FL 220, if the length of the alternate flight plan (ALTN F-PLN) is less than 200 NM.
R — FL 310, if the length of the ALTN F-PLN is greater or equal to 200 NM.

ENTERING THE APPROACH WIND

The wind at destination is entered on the PERF APPR page 3L field. It is a magnetic referenced wind, copied in true reference into DESCEND WIND page at ground level (GRND) and F-PLN B page at destination. A ground entry into DESCENT WIND page is in the same way, copied to F-PLN B page and PERF APPR page (Magnetic) automatically. This wind is modifiable in descent and approach and go around phase.



— SELECT the PERF key on the MCDU

— DEPRESS the NEXT PHASE key (6R)

— WRITE QNH and ENTER it

— WRITE the surface wind (magnetic) into the scratchpad and ENTER it.

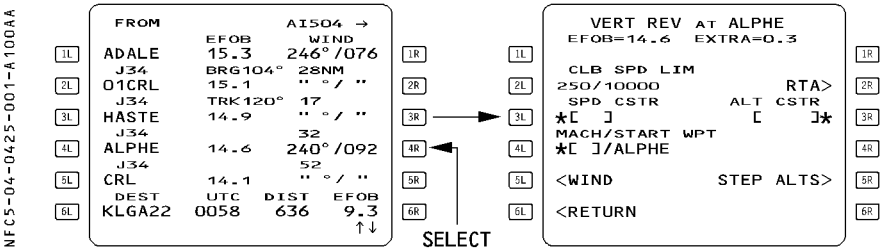
Note : — At each wind entry, the descent profile is recomputed, therefore it is recommended to enter all winds, temperature and QNH at the same time to minimize recomputation time.

GENERAL

The vertical revision function allows the pilot to modify the following parts of the flight plan :

- Speed limit
- Speed and altitude constraints
- Time constraints
- Wind
- Step climb or step descent
- Constant Mach Segment

The pilot selects these functions by pressing the right key on flight plan A or B.



Note : Section (4.04.25) only describes the following three functions : Wind and time constraints, and Constant Mach Segment.
For other vertical revision functions, refer to the next Chapter (4.05).

REQUIRED TIME OF ARRIVAL (RTA)

GENERAL

A Required Time of Arrival (RTA) is a time requirement to be met over a specified waypoint of the lateral flight plan, including destination but excluding the origin and FROM waypoints. When the predictions are available, the time constraint value is replaced by the predicted time at the related waypoint, highlighted by a star (*) :
– If the RTA is predicted as matched, the star (*) is in magenta.
– If the RTA is predicted as missed, the star (*) is in amber.
No specific symbol is provided on the ND.
A time constraint is cleared in the same way as any other constraints. If a time constraint is automatically deleted. The MCDU displays an "RTA DELETED" message.

ENTERING A REQUIRED TIME OF ARRIVAL

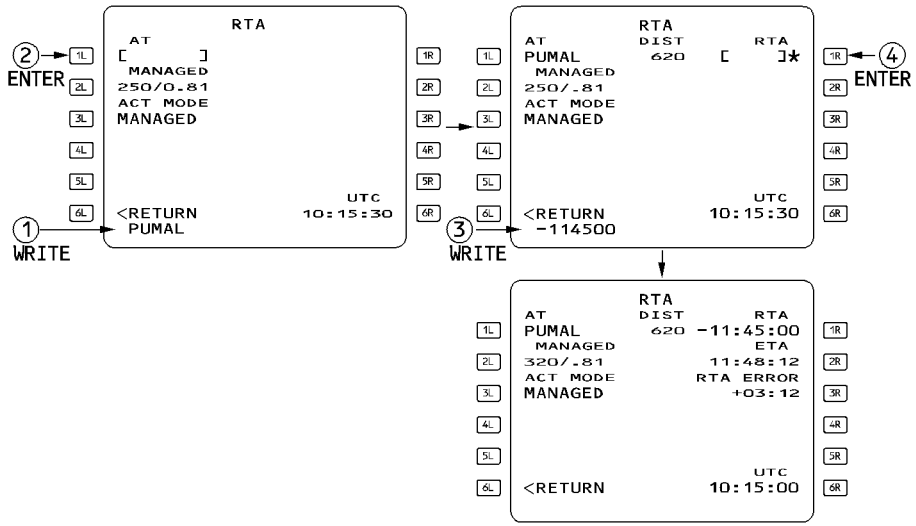
– **SELECT the F-PLN key on the MCDU.**

– **SELECT a VERT REV at the revised waypoint.**

– **SELECT the RTA prompt (2R).**
The MCDU displays the RTA page.

– **WRITE the identifier of the waypoint where the time constraint has to be defined.**

– **ENTER it in the 1L field.**
The RTA prompt and the distance indication appear.



– **WRITE the required time of arrival.**
The format is +/- HHMMSS (entry of seconds is not mandatory).

– **ENTER it in the 1R field.**

– **CHECK the 2R and 3R fields to determine whether the entered constraint can be met.**

WIND – TEMPERATURE – QNH

GENERAL

In order to receive the best predictions, the pilot must enter wind and temperature values for the different phases and for the various waypoints of the cruise phase.
The system uses the temperature value at a given altitude, associated with the tropopause entered on the INIT A page, to optimize the temperature profile.

ENTERING THE TRIP WIND AND TEMPERATURE DURING F-PLN INITIALIZATION

The trip wind is a mean wind component for the entire flight from origin to destination. The pilot can enter it on the INIT B page prior to engine start. It is usually defined by the airlines' flight operations on the computerized flight plan.
The FMGS does not consider the trip wind for alternate predictions.
The trip wind is used as long as no winds are entered in the CLB, CRZ and DES WIND pages.
When the pilot enters a CLB, CRZ or DES WIND, the FMGS disregards the trip wind.

- **PRESS the INIT key.**

- **INSERT the temperature at cruise FL.**

- **On the INIT B page, INSERT the TRIP WIND.**
  The trip wind is defined as a headwind component (HDXX, XXHD or – XX), or as a tailwind (TLXX, XXTL or + XX).
  The FMGS uses the trip wind to compute preliminary performance, time and fuel predictions.

- **CHECK the predictions on the F-PLN B page.**

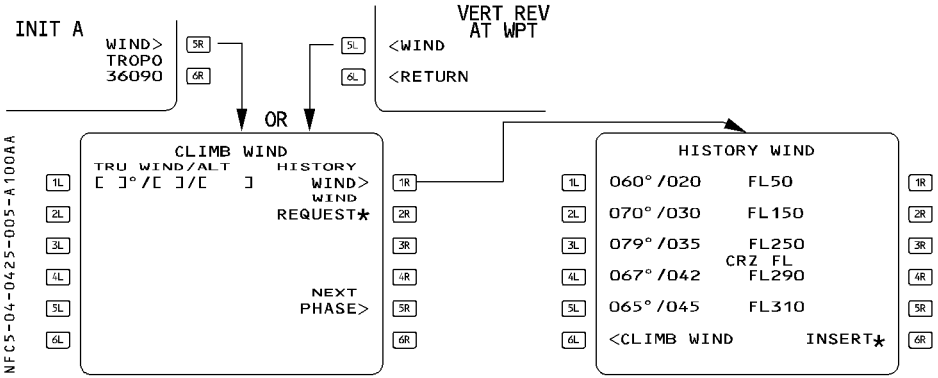
ENTERING THE WIND AND TEMPERATURE DURING F-PLN INITIALIZATION

When completing the INIT A page, and once the wind and cruise FL temperature forecasts are available, the pilot may enter them, if significantly different, by pressing the wind prompt.
The pilot will access the different wind pages by using the NEXT PHASE and PREV PHASE prompts. He will slew the CRZ WIND page to access the various cruise wind waypoints.
The pilot will enter wind data as follows :
- For climb phase : By inserting either the HISTORY WIND data (as recorded during the last descent), or by inserting winds (at up to 5 altitudes) on the CLIMB WIND page.
- For cruise phase : By inserting winds (at up to 4 FL) at various CRZ waypoints on the CRZ WIND pages. The 4 levels are the same for all the cruise waypoints. The pilot may enter the temperature of each waypoint and at destination on this page.
- For descent phase : By inserting winds (at up to 5 FL/altitudes) on the DES WIND page.

– For the ALTN F-PLN, an average wind may be entered on the DES WIND page for alternate cruise flight level.

Note : Wind can be automatically received (and inserted) through the ACARS system (Refer to 4.04.40).

Once a CLIMB, CRZ, or DESCENT WIND is entered, the system ignores the TRIP WIND. Once temperature and winds are inserted, the FMGS computes the ISA profile, and the F-PLN B page displays the forecast wind profile (by linear interpolation and propagation).



WIND ENTRY RULES

When a wind entry is performed from an empty field, direction/velocity/altitude (or flight level) must be entered simultaneously. One entry in each bracket.
Overwriting a wind cancels the previous one.
Entered wind data can be cleared : The field reverts to brackets.
Propagated wind cannot be cleared.
Entering a new altitude, over an existing altitude, replaces that existing altitude at all cruise waypoints. Any winds entered at the overwritten altitude are lost at all cruise waypoints.

ENTERING THE HISTORY WIND (F-PLN INITIALIZATION)

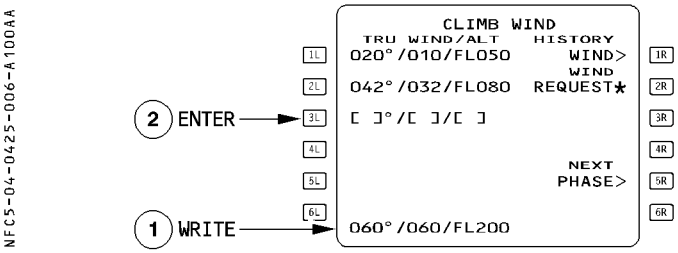
The pilot may insert the history wind, but cannot modify this page.
If convenient, PRESS the (6R) prompt to insert. After insertion, the [6R] prompt is suppressed, but the page still displays the wind values for information.

ENTERING THE CLIMB WIND (F-PLN INITIALIZATION)

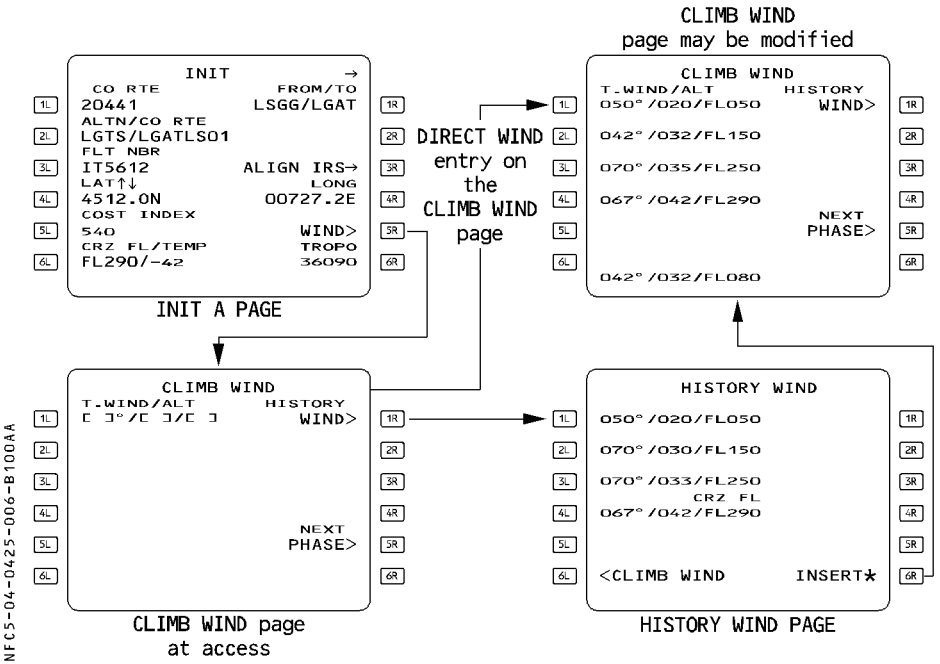
If history winds are not convenient :

– SELECT CLIMB WIND page from INIT A page or VERT REV page.

– WRITE new winds into the scratchpad and ENTER.



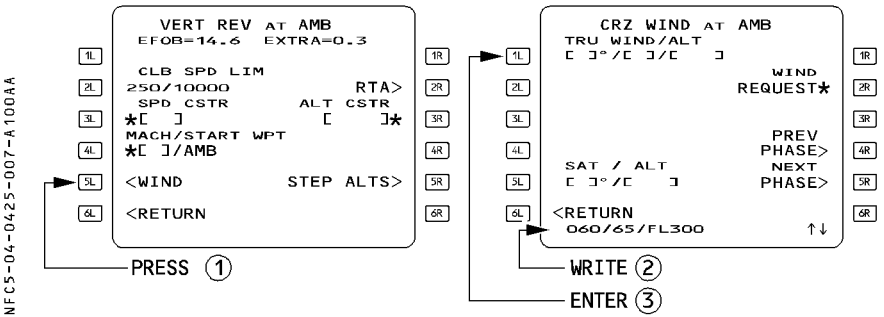
Winds entered on the CLIMB, CRZ, and DESCENT WIND pages are always true north referenced.
Tower wind, entered on PERF APPR page is magnetic-referenced.
The pilot can enter "GRND" in the altitude field for wind at destination.
CLIMB WIND cannot be modified when the climb phase is active.
At climb phase transition, wind data switches from blue to green, and any attempted modification will trigger the "NOT ALLOWED" message.
The system extrapolates the highest wind entry to all higher levels.
The system interpolates winds between 2 entered levels.



ENTERING THE CRUISE WINDS AND TEMPERATURES

At flight plan initialization, the CRZ WIND page displays all cruise waypoints with empty brackets. In flight, only downpath waypoints are displayed.

- **SELECT VERT REV at WPT.**
- **PRESS the WIND prompt.**
- **SELECT NEXT PHASE.**
- **SLEW until relevant waypoint is displayed.**
- **WRITE and ENTER the new temperature into the scratchpad.**
- **WRITE and ENTER the new wind data into the scratchpad.**
  WIND and temperature may be entered through the ACARS pages. Refer to 4.04.40.



NFC5-04-0425-007-A100AA

The crew will modify the entered winds and temperatures in flight, if a significant difference is expected (greater than 30 knots or 30° for the wind data and greater than 5° for the temperature).
The system propagates the pilot's (or ACARS') wind and temperature entries downpath, until a waypoint for which a different temperature or wind has been entered (for the same flight level), or until the last cruise waypoint.
The forecast winds at a waypoint are determined as follows :

- If the predicted altitude at the waypoint matches an altitude defined in the CRZ WIND page, the forecast wind, is the corresponding entered or propagated wind, displayed at that waypoint on the CRZ WIND page.
- If the predicted altitude lies between two altitudes entered on the CRZ WIND page, the wind direction and velocity are linearly interpolated.

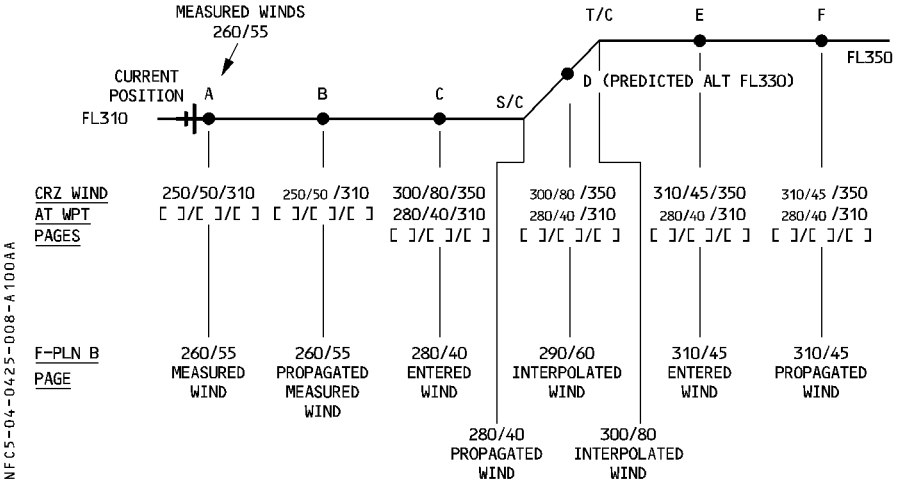
– If the predicted altitude is above or below the set of cruise altitudes, the forecast wind is a constant value extrapolated from the entered or propagated wind at the highest (or lowest) altitude displayed on the CRZ WIND page for that point.

Once in flight, the FMGS considers the actual measured wind up to 200 NM ahead of the aircraft to permanently update the wind profile. This updated wind profile is used to compute the predictions and the performance data, but is not displayed to the crew.

The CRZ WIND pages display the propagated values in small blue font, and the pilot (or ACARS) entries in large blue font.

Note : The CRZ WIND page displays ACARS or crew-entered or propagated data. It never displays computed data (F-PLN B page only).

Example :



EFFECT OF WIND ENTRIES ON OPTIMUM FLIGHT LEVEL

The OPT FL computation considers the wind entries made at different altitudes (normally at the different CRZ FL).

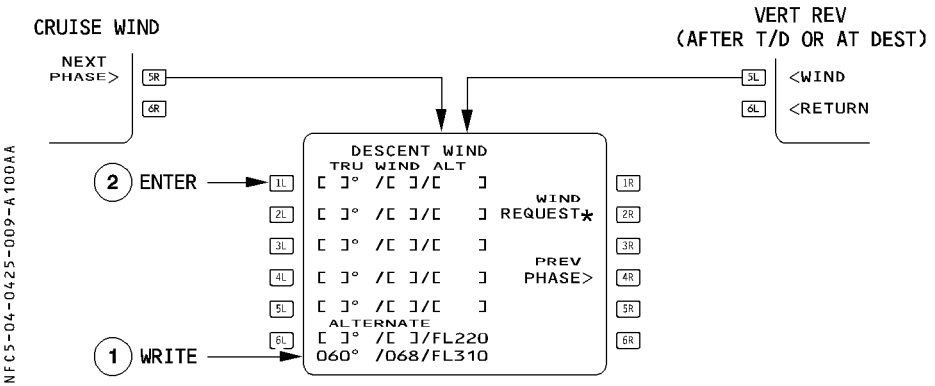
When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be affected by the wind entries made at the previous CRZ FL ; these winds are automatically propagated and may be significantly different from the actual winds.

We recommend the following procedure : If the propagated winds at the lower altitudes are significantly different from the actual winds, enter the wind at these altitudes, or if not available, the wind measured at the current CRZ FL.

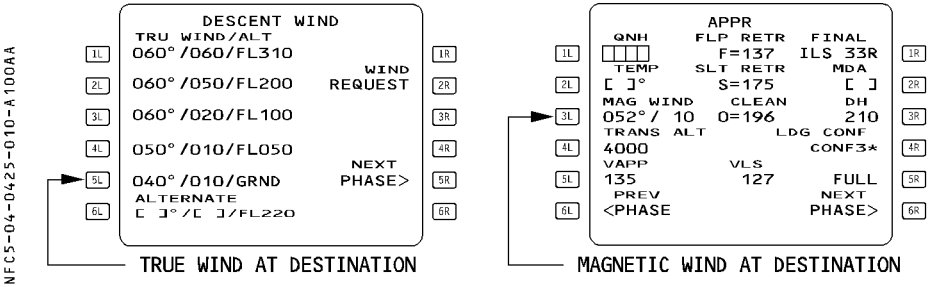
ENTERING THE DESCENT WINDS

The pilot will enter as many as one wind at 5 different FL or altitudes. This wind data will be used for descent profile and prediction computation.
From the vertical revision page, or from the CRZ WIND page :

- **PRESS the WIND prompt.**
- **SELECT the DESCENT WIND page.**
- **ENTER up to 5 different "wind/altitude".**



A wind is written as true direction/velocity/flight level or altitude in feet.
If the crew enters "GRND" in the altitude field, the system uses the associated wind as wind at destination.
The descent profile is corrected, as well as the tower wind entered in the PERF APPR page.



When the winds have been entered, the F-PLN B page displays the forecasted wind profile at all descent waypoints, using values it has interpolated from manual entries. Descent winds are not modifiable when the descent, approach, or go-around phase is active. At descent phase transition, wind data switches from blue to green, and any attempted modification will trigger the "NOT ALLOWED" message.

ENTERING THE ALTERNATE WIND

Alternate wind is entered on the DESCENT WIND page. The altitude is defaulted to FL 220 or 310, but can be corrected. If an alternate wind is not defined, the predictions are computed with a wind defaulted to zero.
Alternate wind can be modified at any time.
The alternate wind profile is as follows :

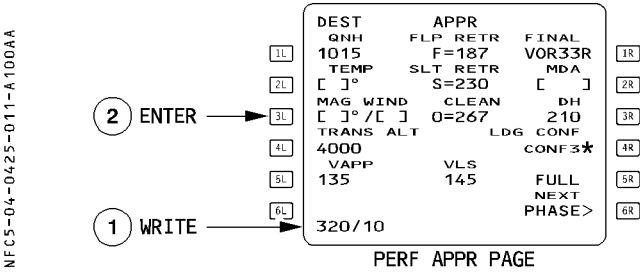
– ALTN CLB wind : Mean wind between ALTN CRZ wind (as entered on the DESCENT WIND page), and the wind at primary DEST (as entered on the PERF APPR page).

– ALTN CRZ wind : If no ALTN WIND has been entered on the DESCENT WIND page, the WIND at primary DEST (as entered on the PERF APPR page) is considered.
In case no entry is made, zero wind is assumed.

– ALTN DES wind : Mean wind between ALTN CRZ WIND and wind at FL 100.
Wind at FL 100 = Interpolation between wind at ALTN CRZ FL and zero at ALTN DEST.

ENTERING THE APPROACH WIND TEMPERATURE AND QNH

The wind at destination is entered in the 3L field of the PERF APPR page.
It is copied in true reference into the DESCENT WIND page at ground level (GRND), and F-PLN B page at destination. A ground entry on the DESCENT WIND page is, in the same way, automatically copied to F-PLN B page and the PERF APPR page.
This wind is modifiable in descent, approach, and go-around phases.



PERF APPR PAGE

– **SELECT the PERF key on the MCDU.**

– **PRESS NEXT PHASE (6R).**

– **WRITE QNH and temperature, and enter them.**

– **WRITE the surface wind in the scratchpad, and enter it.**

Note : – At each wind entry, the descent profile is recomputed. Therefore, it is recommended to enter all winds, temperature, and QNH at the same time in order to minimize recomputation time.

CONSTANT MACH SEGMENT

GENERAL

The pilot can enter the start and end points of a constant Mach segment, and its associated Mach number, from the VERT REV page.
Only one constant Mach segment may be defined in the active flight plan, and only one in the secondary flight plan. No constant Mach segment can be defined in the alternate flight plan.

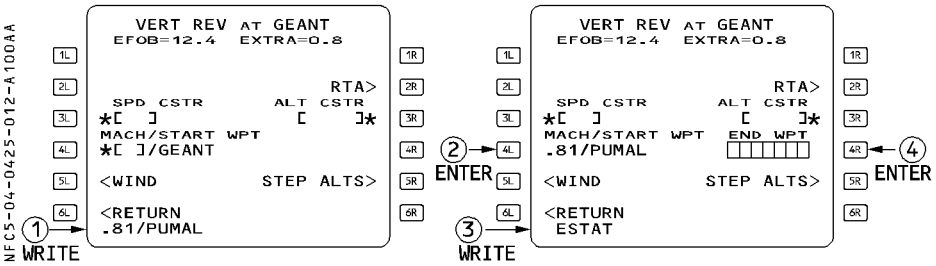
ENTERING A CONSTANT MACH SEGMENT

– **SELECT the F-PLN key on the MCDU.**

– **SELECT VERT REV at a waypoint .**
(Except the destination and alternate flight plan waypoint).

– **WRITE the Mach/start waypoint pair.**
It is possible to enter only the Mach or the waypoint. But, for the first entry, a Mach entry is mandatory.
The waypoint must be located in front of the aircraft and must be part of the cruise.

– **ENTER it in the 4L field**
The END WPT prompt appears in the 4R field.



– **WRITE the end waypoint.**
The end waypoint must be part of the cruise.

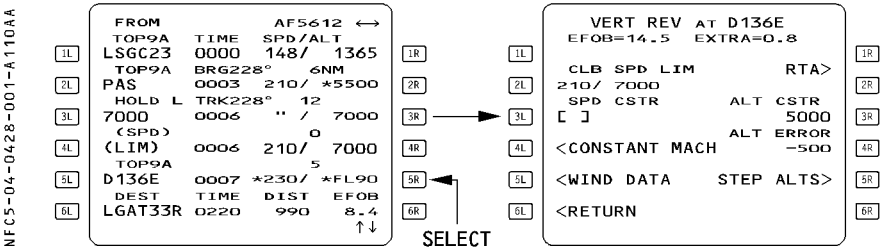
– **ENTER it in the 4R field.**

GENERAL

The vertical revision function allows the crew to insert or modify the following items :

- The Speed limit (SPD LIM)
- Speed and altitude constraints
- Time constraints (RTA)
- Predicted Winds
- Step climb or step descent
- Constant Mach in cruise

The crew calls up the VERT REV page by pressing the right key on F-PLN A or B page.



Note : FCOM 4.04.28 only describes the wind and time constraints.
For other vertical revision functions, refer to the FCOM 4.05.

TIME CONSTRAINT/RTA

GENERAL

A Required Time of Arrival (RTA) is a time requirement to be met over a specified waypoint of the lateral flight plan, including destination but excluding the origin and FROM waypoints. Once the predictions are available, the time constraint value is replaced by the predicted time at the related waypoint, highlighted by a star (*) :

– If the RTA is predicted as matched, the star (*) is in magenta.

– If the RTA is predicted as missed, the star (*) is in amber.

No specific symbol is provided on the ND.

A time constraint is cleared as any other constraints. If a time constraint is automatically deleted, an "RTA DELETED" message is displayed on the MCDU.

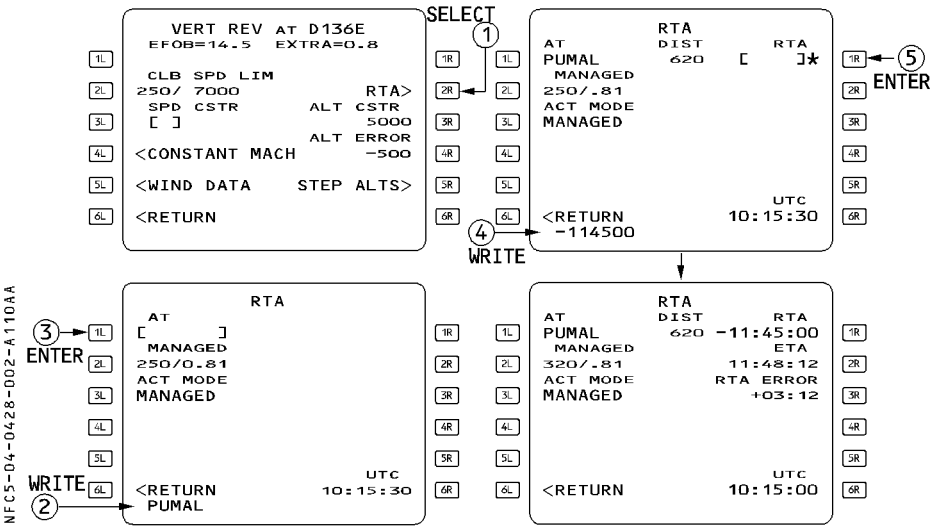
ENTERING A REQUIRED TIME OF ARRIVAL

– **SELECT the F-PLN key on the MCDU.**

– **SELECT a VERT REV at any waypoint.**

– **SELECT the RTA prompt (2R).**
The MCDU displays the RTA page.

– **ENTER the waypoint where the time constraint has to be defined, in the [1L] prompt.**
The RTA prompt and the distance indications appear.



– **ENTER the required time of arrival, in the [1R] field.**
The format is +/- HHMMSS (entry of seconds is not mandatory).

– **CHECK the 2R and 3R fields to determine whether the entered constraint can be met.**

WIND – TEMPERATURE – QNH

GENERAL

In order to obtain the best predictions, the crew must enter wind and temperature values for the different phases and for the various waypoints of the cruise phase.
The system uses the temperature value at a given altitude, associated with the tropopause entered on the INIT A page, to optimize the temperature profile.

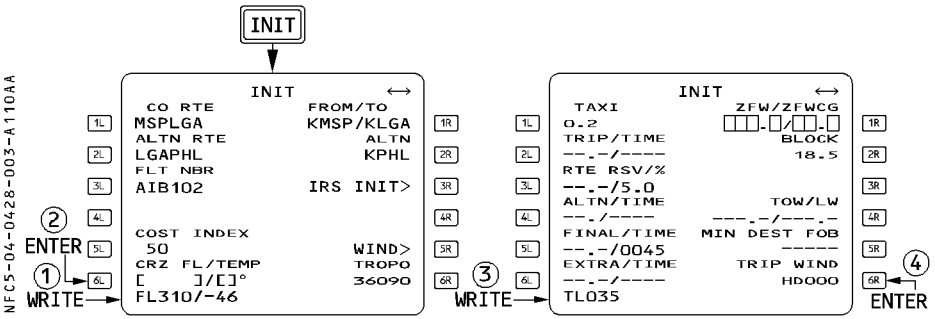
ENTERING THE TRIP WIND AND TEMPERATURE DURING F-PLN INITIALIZATION

The trip wind is a mean wind component for the entire flight from origin to destination. The crew can enter it on the INIT B page before engine start. It is usually defined by the airlines' flight operations on the computerized flight plan.
The FMGS does not consider the trip wind for alternate predictions.
The trip wind is used, as a global wind during flight for both predictions and guidance, if no winds are entered in the CLB, CRZ and DES WIND pages.
When the crew enters a CLB, CRZ or DES WIND, the FMGS disregards the trip wind, and the TRIP WIND field on the INIT B page is dashed. Trip wind used for guidance is not relevant.

– **PRESS the INIT key.**

– **INSERT the temperature at CRZ FL (6L field).**

– **On the INIT B page, INSERT the TRIP WIND (6R field).**
The trip wind is defined as a headwind component (HDXX, XXHD or – XX), or as a tailwind (TLXX, XXTL or + XX).
The FMGS uses the trip wind to compute preliminary performance, time and fuel predictions.



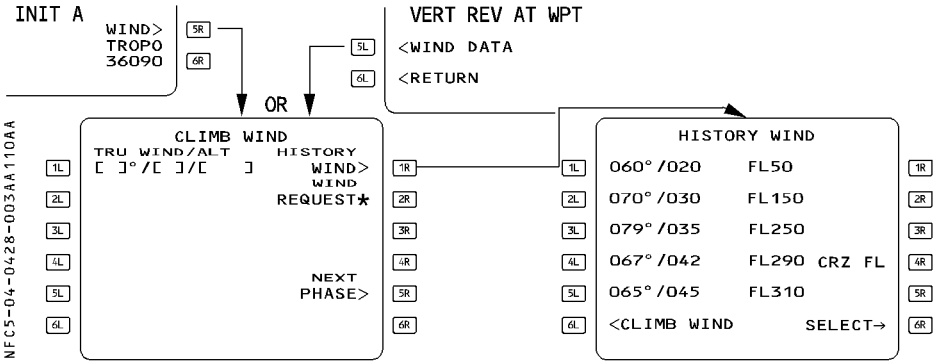
ENTERING THE WIND AND TEMPERATURE DURING F-PLN INITIALIZATION

When completing the INIT A page, and once the wind and cruise FL temperatures forecasts are available, the crew can enter them, if significantly different, by pressing the wind prompt.
The crew accesses the various WIND pages by using the NEXT PHASE and PREV PHASE prompts. They can slew the CRZ WIND page to access the various wind values at each cruise waypoints.
The crew can enter wind data as follows :

- For climb phase : By inserting either the HISTORY WIND data (as recorded during the last descent), or by inserting winds (at up to 5 altitudes/FL) on the CLIMB WIND page.
- For cruise phase : By inserting winds (at up to 4 FL) at various CRZ waypoints on the CRZ WIND pages. The 4 levels are the same for all the cruise waypoints. The crew may enter the temperature at each waypoint on this page.
- For descent phase : By inserting winds (at up to 5 FL/altitudes) on the DES WIND page.
- For the ALTN F-PLN, an average wind may be entered on the DES WIND page for alternate cruise flight level.

Note : Wind can be automatically received (and inserted) via the ACARS system (Refer to 4.04.40).

Once a CLIMB, CRZ, or DESCENT WIND is entered, the system ignores the TRIP WIND.
Once temperature and winds are inserted, the FMGS computes the ISA profile, and the F-PLN B page displays the forecast wind profile (by linear interpolation and propagation).



WIND ENTRY RULES

When a wind entry is performed from an empty field, direction/velocity/altitude (or flight level) must be entered simultaneously. One entry in each bracket.
Overwriting a wind cancels the previous one.
Entered wind data can be cleared : The field reverts to brackets.
Propagated wind cannot be cleared.
Entering a new altitude, over an existing altitude, replaces that existing altitude at all cruise waypoints. Any winds entered at the overwritten altitude are lost at all cruise waypoints.

ENTERING THE HISTORY WIND (F-PLN INITIALIZATION)

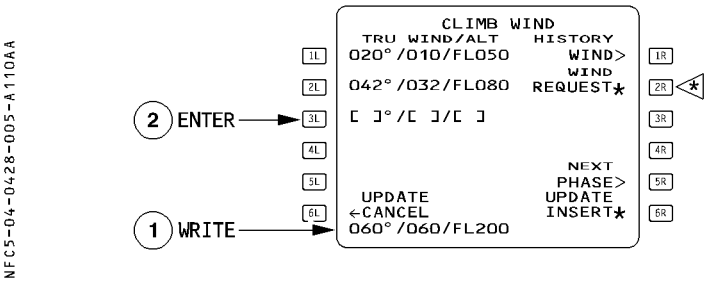
The crew may insert the history winds, but cannot modify this page.
If convenient, PRESS the (6R) prompt on the HISTORY WIND page to insert them. After insertion, the [6R] prompt is suppressed, but the page still displays the wind values for information.

ENTERING THE CLIMB WIND (F-PLN INITIALIZATION)

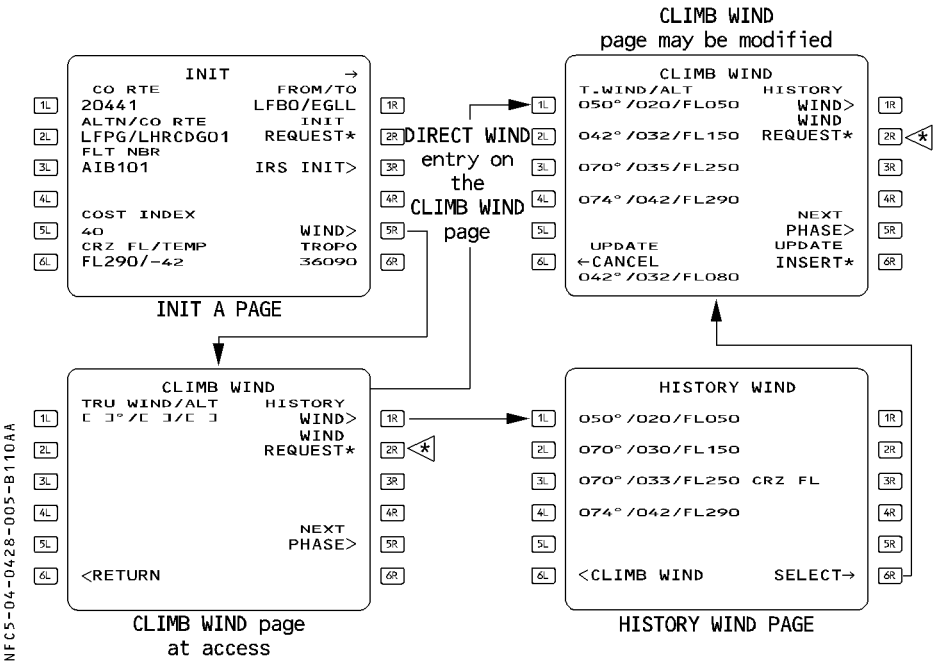
If history winds are not convenient :

– SELECT CLIMB WIND page from INIT A page or VERT REV page.

– WRITE new winds in the scratchpad and ENTER them in the empty fields.



The crew can enter "GRND" in the altitude field to specify the wind at ground level, at the departure airport.
CLIMB WIND cannot be modified when the climb phase is active.
At climb phase transition, wind data switches from blue to green colour and any attempted modification will trigger the "NOT ALLOWED" message.
The system interpolates winds between 2 entered levels.



ENTERING THE CRUISE WINDS AND TEMPERATURES

A flight plan initialization, the CRZ WIND page displays all cruise waypoints with empty brackets. In flight, only downpath waypoints are displayed.

– SELECT INIT or VERT REV at WPT.

– PRESS the WIND DATA prompt.

– SELECT NEXT PAGE, to reach the CRUISE WIND page.

R For each desired waypoint :

– SCROLL until the waypoint is displayed.

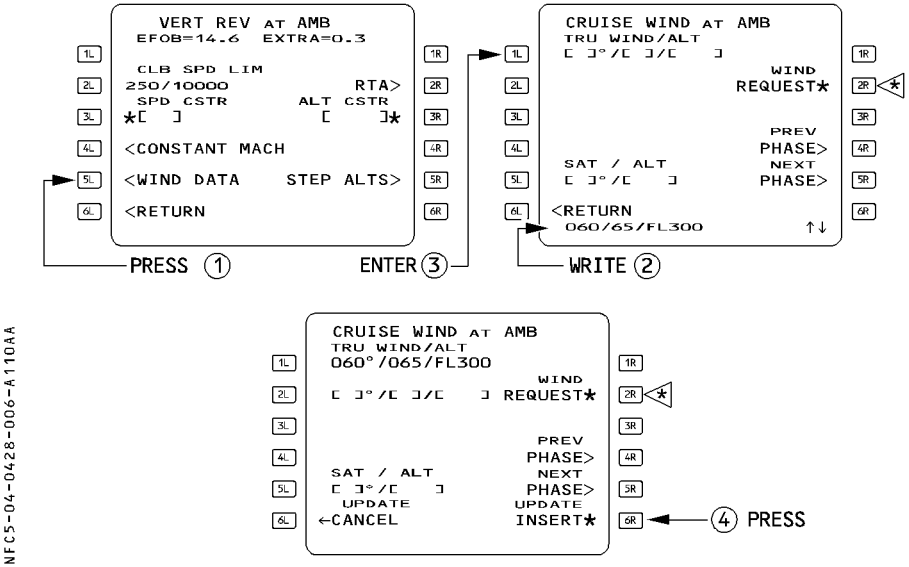
– WRITE the new temperature and altitude in the scratchpad, and ENTER it.

– WRITE the new wind data and altitude in the scratchpad, and ENTER IT
WIND and temperature may be entered through the ACARS pages. Refer to 4.04.40.

R Then, when wind update is complete for all these waypoints :

– PRESS the UPDATE INSERT prompt.

R The wind profile is updated and predictions are re-computed only once this prompt is
R pressed.



The crew should modify the entered winds and temperatures in flight, if a significant difference is expected (greater than 30 knots or 30° for the wind data and greater than 5° for the temperature).

The FMS propagates the crew (or ACARS) wind and temperature entries downpath, until a waypoint for which a different temperature or wind has been entered (for the same flight level), or until the last cruise waypoint.

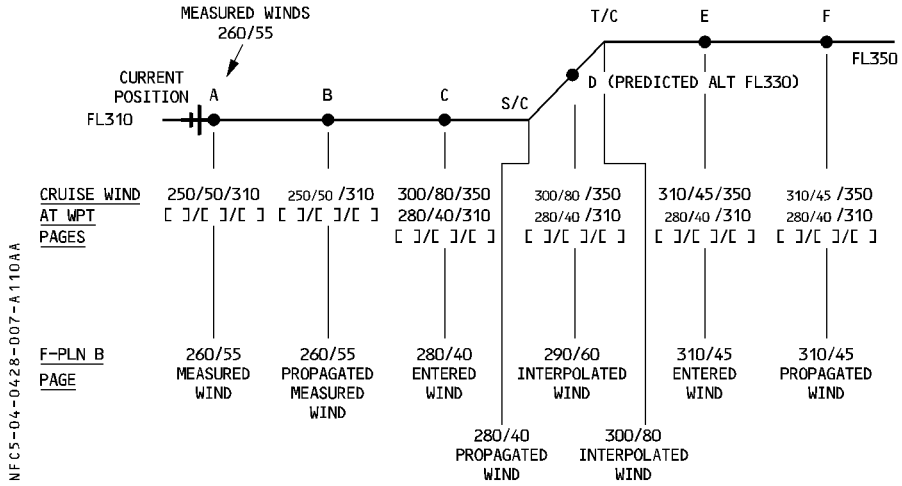
The forecast winds at a waypoint are determined as follows :

- If the predicted altitude at the waypoint matches an altitude defined in the CRUISE WIND page, the forecast wind is the corresponding entered or propagated wind, displayed at that waypoint on the CRUISE WIND page.
- If the predicted altitude lies between two altitudes entered on the CRUISE WIND page, the wind direction and velocity are linearly interpolated.
- If the predicted altitude is above or below the set of CRUISE altitudes, the forecast wind is a constant value extrapolated from the entered or propagated wind at the highest (or lowest) altitude displayed on the CRUISE WIND page for that waypoint.

Once in flight, the FMGS considers the real, measured wind up to 100 NM ahead of the aircraft, to permanently update the wind profile. This updated wind profile is used to compute the predictions and the performance data, but is not displayed to the crew.

The CRUISE WIND pages display the propagated values in small cyan font, and the crew (or ACARS) entries in large cyan font.

Note : The CRUISE WIND page displays ACARS data, crew-entered data or propagated data. It never displays computed data (displayed on the F-PLN B page only).



EFFECT OF WIND ENTRIES ON OPTIMUM FLIGHT LEVEL

The OPT FL computation considers the wind entries made at different altitudes (normally at the different CRZ FL).

When flying the subsequent CRZ FL, the OPT FL proposed by the PROG page may be affected by the wind entries made at the previous CRZ FL ; these winds are automatically propagated and may be significantly different from the actual winds.

We recommended the following procedure : if the propagated winds at the lower altitudes are significantly different from the actual winds, enter the wind at these altitudes, or if not available, the wind measured at the current CRZ FL.

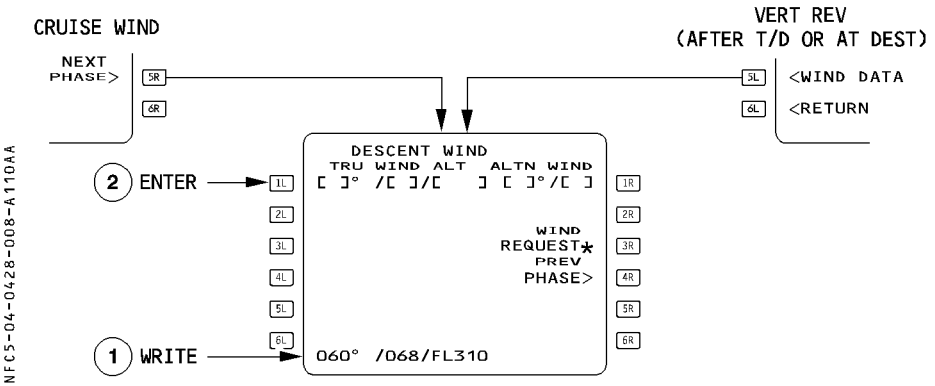
ENTERING THE DESCENT WINDS

The crew will enter as many as one wind at 5 different FL or altitudes. This wind data will be used for descent profile and prediction computation.
From the vertical revision page, or from the CRUISE WIND page :

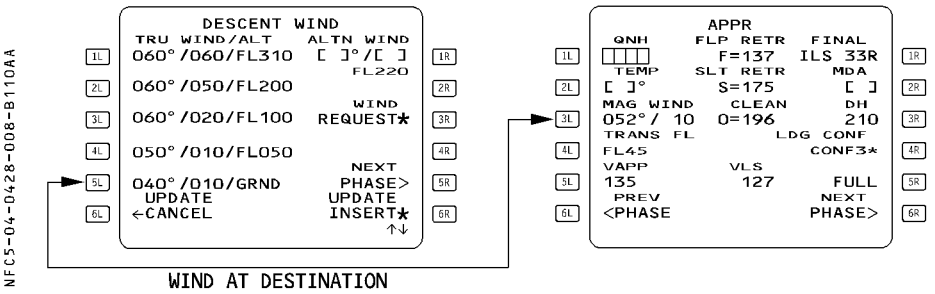
– PRESS the WIND prompt.

– SELECT the DESCENT WIND page.

– ENTER up to 5 different "wind/altitude".



A wind is written as true direction/velocity/flight level or altitude in feet.
If the crew enters "GRND" in the altitude field, the system uses the associated wind as wind at destination.
The descent profile is corrected, as well as the tower wind entered in the PERF APPR page.



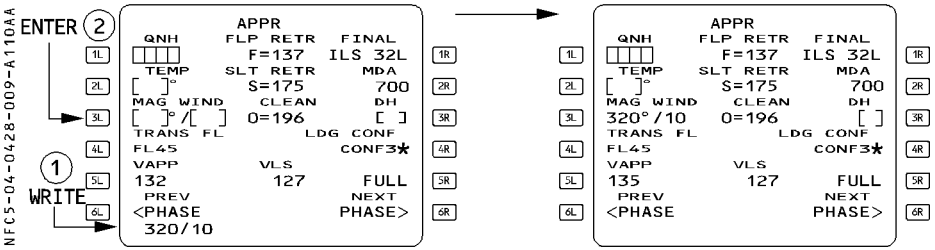
When the winds have been entered, the F-PLN B page displays the forecast wind profile at all descent waypoints using values it has interpolated from manual entries. Descent winds are not modifiable when descent, approach or go around phase is active. At descent phase transition, wind data changes color from blue to green and any attempted modification triggers the "NOT ALLOWED" message.

ENTERING THE ALTERNATE WIND

Alternate wind is entered in the DESCENT WIND page. The altitude is blanked if no alternate destination is defined. If an alternate wind is not defined, the predictions are computed with a wind defaulted to zero.
Alternate wind can be modified at any time.

ENTERING THE APPROACH WIND

The wind at destination is entered on the PERF APPR page, [3L] field. It is a magnetic referenced wind, copied in true reference into DESCENT WIND page at ground level (GRND) and F-PLN B page at destination. A ground entry on the DESCENT WIND page is in the same way, copied to F-PLN B page and PERF APPR page (Magnetic) automatically. This wind is modifiable in descent and approach and go-around phase.



- **SELECT the PERF key on the MCDU**
- **PRESS the NEXT PHASE key [6R], to reach PERF APPR page.**
- **WRITE the surface wind (magnetic) in the scratchpad and ENTER it in the [3L] field.**

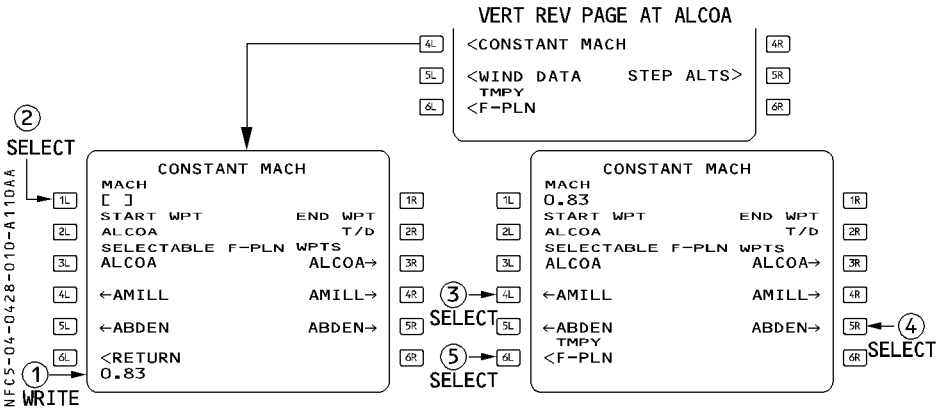
CONSTANT MACH

GENERAL

The crew can specify a part of the F-PLN to be flown at a given Mach value, using the Constant Mach function.
Only one Constant Mach segment may be defined in the active flight plan, and one in the secondary flight plan. No Constant Mach segment can be defined in the alternate flight plan.

ENTERING A CONSTANT MACH SEGMENT

- **SELECT the F-PLN key on the MCDU.**
- **SELECT VERT REV at any F-PLN waypoint.**
- **SELECT the CONSTANT MACH prompt [4L], to access the CONSTANT MACH page.**
- **ENTER the desired Mach value in the [1L] field.**
- **SELECT the Start waypoint [2L] and End waypoint [2R] within the list of selectable waypoint (3L → 5L, 3R → 5R, "SELECTABLE F-PLN WPTS").**
  When accessing the CONSTANT MACH page, the Start waypoint is defaulted to the waypoint at which the VERT REV has been performed (provided it is a cruise waypoint). The End waypoint is defaulted to the Top of Descent (T/D).

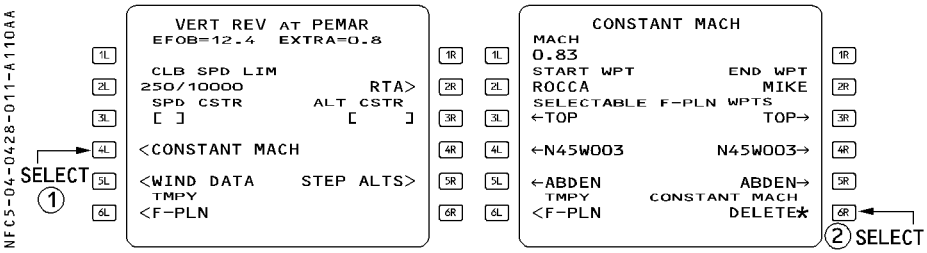


- **ACCESS the temporary flight plan by pressing [6L] key. Revise as necessary.**
- **INSERT the temporary flight plan by pressing [6L] key.**

DELETING A CONSTANT MACH

To delete a previously-entered Constant Mach :

- **SELECT the F-PLN key on the MCDU**
- **SELECT VERT REV at any F-PLN waypoint**
- **SELECT the CONSTANT MACH prompt (4L)**
- **SELECT the CONSTANT MACH DELETE prompt (6R)**
  The Constant Mach is deleted.



EFFECT OF REFERENCE BAROMETER SETTING

GENERAL

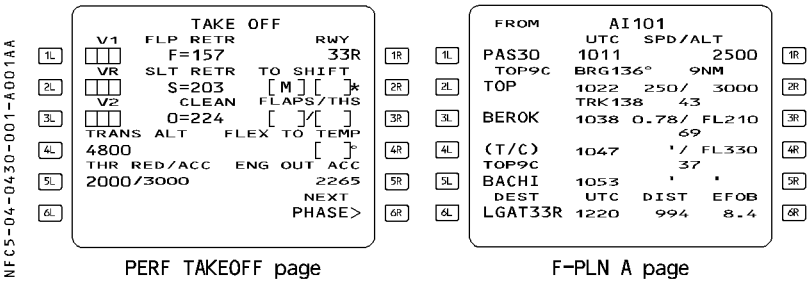
The baro reference selector of the E.I.S (Electronic Instrument System) allows the pilot to use the standard barometric reference (STD), sea level atmospheric pressure (QNH), or atmospheric pressure at airfield elevation (QFE option) for the barometer setting.
The selected value is displayed in the baro reference display window of the EFIS control panel and on the Primary Flight Display (PFD) below the altitude scale.
The barometer setting is used as a reference for the altimeter of the PFD and for the PFD target altitude. In flight, it affects the predicted altitudes on the MCDU and the descent path computation.

MCDU ALTITUDE PREDICTIONS

The FMGS predicts at each waypoint of the flight plan an altitude that is a function of all data in the lateral and vertical flight plans.

On the ground

The altitude predicted at each waypoint is displayed as altitude in feet above mean sea level (AMSL) when it is below the transition altitude and as flight level when it is above the transition altitude. The altitude constraints are also displayed, and they follow the same rule (feet or flight level).
The predicted altitude is equal to the airport elevation plus the height you must attain in order to reach the waypoint in the applicable mode (climb or descent).



PERF TAKEOFF page F-PLN A page

NFCS-04-0430-001-A01AA

In flight

The predicted altitude is equal to the aircraft altitude (as a function of the barometer setting), plus or minus the height you must attain to reach the waypoint in the applicable mode (climb or descent).

– In climb :

Altitude predictions and constraints are displayed as altitude in feet above mean sea level (AMSL) at, or below, the transition altitude, and as the flight level above it.

For example : If the transition altitude is 5000 feet and you insert an altitude constraint
R as 8000 feet, the MCDU F-PLN A page displays it as FL80.

– In descent :

If "STD" is selected on the EIS control panel, altitude predictions and constraints above the transition level are displayed as flight levels, and those below the transition level are displayed as altitude AMSL.

If sea level standard pressure (QNH), or field elevation pressure (QFE option), is selected on the EIS control panel, altitude predictions and constraints are displayed as altitudes AMSL, regardless of the transition altitude.

For example : If the transition level is FL50 and you insert an altitude constraint of
R 8000 feet into the MCDU, the MCDU F-PLN A page will display it as FL80, if "STD" is selected, and as 8000 feet, if "QNH" (or "QFE" option) F-PLN A page is selected.

TARGET ALTITUDE ON PFD

The PFD target altitude may either be :

– The altitude selected on the FCU, or

– A flight management altitude constraint, if the climb mode or descent mode is engaged and the system predicts a level-off at a constraint that comes before reaching the FCU altitude.

The PFD target altitude depends on the barometer setting :

– If "STD" is selected, the target is a flight level.

– If "QNH" or "QFE" is selected, the target is an altitude or height.

The aircraft will level off accordingly.

Note : – If the pilot changes the barometer setting during ALT or ALT CST*, the aircraft may overshoot the target altitude, because the current value has been changed. However, the ALT* and ALT CST* modes allow the aircraft to regain the FCU altitude. As a general rule, avoid changing the barometer setting when in ALT* or ALT CST*.*

– In aircraft equipped to use field elevation pressure (QFE option), switching from STD to QFE (or vice versa) in ALT CST green changes the target value and may revert the vertical mode into V/S mode.*

EFFECT OF REFERENCE BAROMETER SETTING

GENERAL

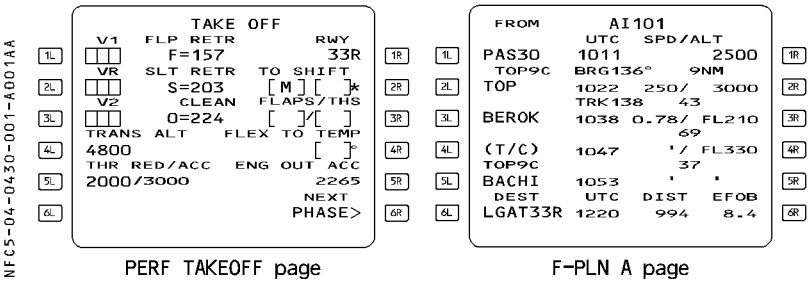
The baro reference selector of the E.I.S (Electronic Instrument System) allows the pilot to use the standard barometric reference (STD), sea level atmospheric pressure (QNH), or atmospheric pressure at airfield elevation (QFE option) for the barometer setting.
The selected value is displayed in the baro reference display window of the EFIS control panel and on the Primary Flight Display (PFD) below the altitude scale.
The barometer setting is used as a reference for the altimeter of the PFD and for the PFD target altitude. In flight, it affects the predicted altitudes on the MCDU and the descent path computation.

MCDU ALTITUDE PREDICTIONS

The FMGS predicts at each waypoint of the flight plan an altitude that is a function of all data in the lateral and vertical flight plans.

On the ground

The altitude predicted at each waypoint is displayed as altitude in feet above mean sea level (AMSL) when it is below the transition altitude and as flight level when it is above the transition altitude. The altitude constraints are also displayed, and they follow the same rule (feet or flight level).
The predicted altitude is equal to the airport elevation plus the height you must attain in order to reach the waypoint in the applicable mode (climb or descent).



PERF TAKEOFF page F-PLN A page

NFCS-04-0430-001-A01AA

In flight

The predicted altitude is equal to the aircraft altitude (as a function of the barometer setting), plus or minus the height you must attain to reach the waypoint in the applicable mode (climb or descent).

- In climb :
  Altitude predictions and constraints are displayed as altitude in feet above mean sea level (AMSL) at, or below, the transition altitude, and as the flight level above it.
  For example : If the transition altitude is 5000 feet and you insert an altitude constraint as 8000 feet, the MCDU F-PLN A page displays it as FL80.
- In descent :
  If "STD" is selected on the EIS control panel, altitude predictions and constraints above the transition level are displayed as flight levels, and those below the transition level are displayed as altitude AMSL.
  If sea level standard pressure (QNH), or field elevation pressure (QFE option), is selected on the EIS control panel, altitude predictions and constraints are displayed as altitudes AMSL, regardless of the transition altitude.
  For example : If the transition level is FL50 and you insert an altitude constraint of 8000 feet into the MCDU, the MCDU F-PLN A page will display it as FL80, if "STD" is selected. If "QNH" (or "QFE" option) is selected, the MCDU F-PLN A page will display the barometric corrected altitude constraint.

TARGET ALTITUDE ON PFD

The PFD target altitude may either be :

- The altitude selected on the FCU, or
- A flight management altitude constraint, if the climb mode or descent mode is engaged and the system predicts a level-off at a constraint that comes before reaching the FCU altitude.

The PFD target altitude depends on the barometer setting :

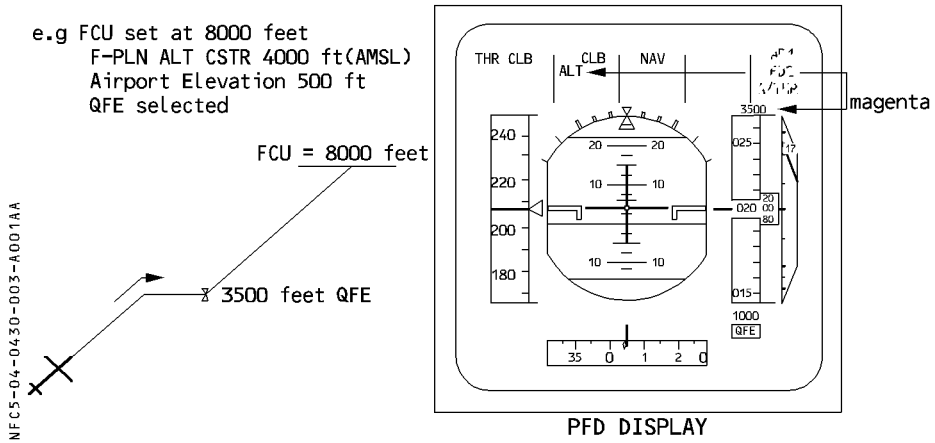
- If "STD" is selected, the target is a flight level.
- If "QNH" or "QFE" is selected, the target is an altitude or height.

The aircraft will level off accordingly.

Note for aircraft with QFE (Field Elevation Pressure) pin program

If you select "QFE" on the EFIS control panel :

- The MCDU predictions follow the basic rules (altitudes are AMSL below the transition level, flight levels above it).
- The altitude constraints on the MCDU follow the basic rules.
- The target altitude on the PFD is QFE related :
  - If the target altitude has been selected by the FCU, the aircraft will level off there.
  - If the target altitude is an altitude constraint, the PFD automatically shows that constraint as corrected by the airport elevation.



PFD DISPLAY

PROCEDURES

a) The altitude constraints in departure and arrival procedures should be defined in the navigation database or by the pilot on the MCDU :
   - in terms of altitude AMSL below the transition altitude
   - in terms of flight level above the transition altitude

   If a departure procedure defines an altitude constraint as an AMSL altitude above the
R transition altitude, you must convert it to STD, because the system and guidance will treat it as a flight level whenever you select the standard barometer setting.

b) In climb you should switch from QNH (or QFE) to STD on both EFIS control panels simultaneously when you reach the transition altitude.
   All MCDU altitude predictions and altitude constraints and all PFD altitude targets will be displayed as flight levels.

c) In descent, when ATC clears you to an altitude below the transition altitude, you can select QNH (or QFE) on both EFIS control panels simultaneously.
   All MCDU altitude predictions and contraints and PFD targets are now altitude AMSL.

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CLEAR KEY (CLEARING FUNCTION)

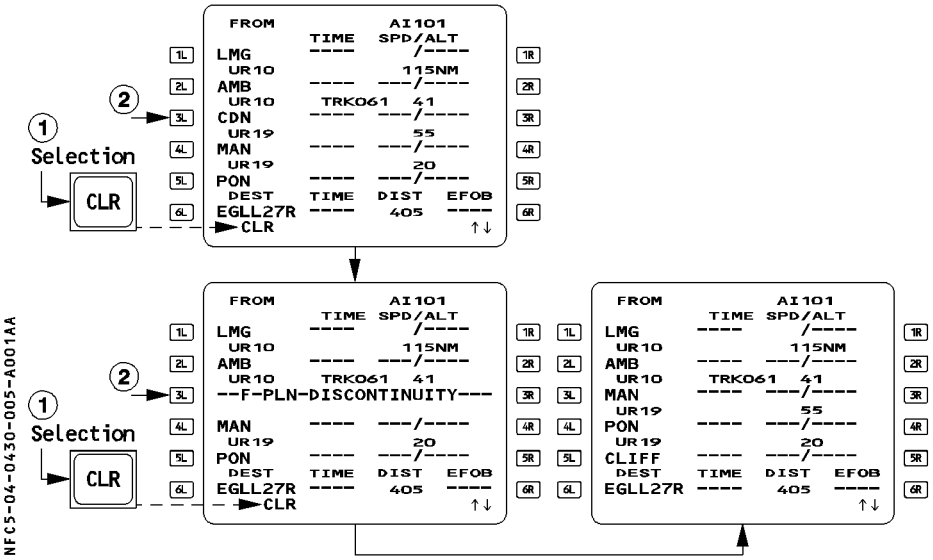
CLEARING THE SCRATCHPAD OF DATA OR MESSAGES

Press the "CLR" key with a single brief touch to erase the last alphanumeric character inserted in the scratchpad.
Press the key for more than three seconds to erase all the data inserted in the scratchpad.
If the scratchpad is empty, it displays "CLR".

CLEARING DATA FIELDS

Clear a data field by pressing the "CLR" key, the scratchpad displays CLR, then select the prompt for the field you want to clear (3L for example).

- You cannot clear all data fields :
  - If the field contains data that has a default value or a value computed by the FMGC, the data reverts to this value.
  - Any attempt to clear the defaulted value has no effect.
- Clearing a constraint on the F-PLN page deletes both the speed constraint and the altitude constraint associated with the waypoint.
- If you clear a data field that is a waypoint in the flight plan (primary or secondary), you delete this waypoint from the flight plan and create a discontinuity. The discontinuity can also be cleared in a similar way.



HOW TO EXECUTE A DIVERSION

The FMGS will assist the pilot if it becomes necessary to divert to an alternate airport.

DIVERSION TO PREPLANNED ALTERNATE AIRPORT

This would probably occur at the end of the cruise phase, during descent or go-around. The pilot can use this method for diverting if the primary flight plan includes an alternate flight plan from destination to a suitable alternate airport.
When decided to divert to the alternate airport from a given waypoint, simply execute an "ENABLE ALTN" (enable alternate) revision :

- **SELECT "LAT REV" at a given waypoint**
- **PRESS the "ENABLE ALTN" key**
- **INSERT the temporary flight plan (TMPY F-PLN).**
- **ADJUST the resulting active flight plan.**
  (Refer to 4.04.10).

DIVERSION TO ANY ADEQUATE AIRPORT

May occur if any unexpected event requires a diversion.
In this case use either a secondary flight plan or a lateral revision for a new destination.

CLEAR KEY (CLEARING FUNCTION)

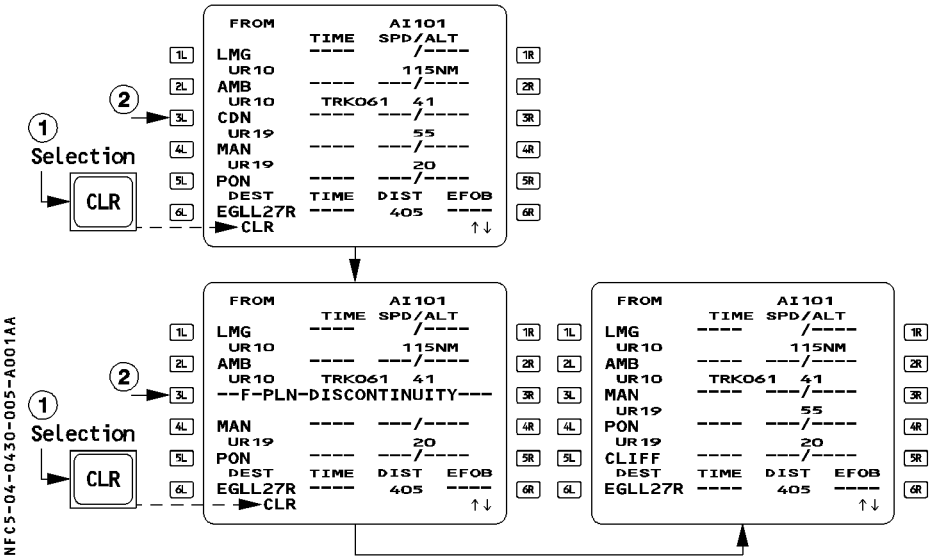
CLEARING THE SCRATCHPAD OF DATA OR MESSAGES

Press the "CLR" key with a single brief touch to erase the last alphanumeric character inserted in the scratchpad.
Press the key for more than three seconds to erase all the data inserted in the scratchpad.
If the scratchpad is empty, it displays "CLR".

CLEARING DATA FIELDS

Clear a data field by pressing the "CLR" key, the scratchpad displays CLR, then select the prompt for the field you want to clear (3L for example).

- You cannot clear all data fields :
  - If the field contains data that has a default value or a value computed by the FMGC, the data reverts to this value.
  - Any attempt to clear the defaulted value has no effect.
- Clearing a constraint on the F-PLN page deletes both the speed constraint and the altitude constraint associated with the waypoint.
- If you clear a data field that is a waypoint in the flight plan (primary or secondary), you delete this waypoint from the flight plan and create a discontinuity. The discontinuity can also be cleared in a similar way.

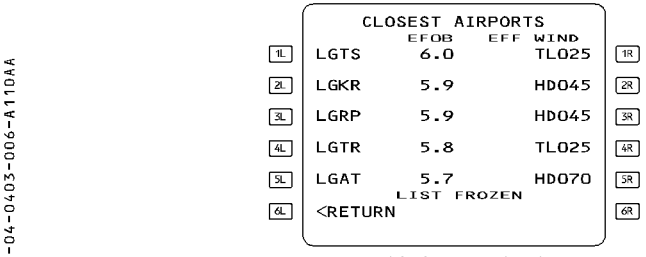


HOW TO EXECUTE A DIVERSION

Various features are provided to the crew in order to execute a diversion :
- The EQUITIME POINT
- The CLOSEST AIRPORTS pages
- The SECONDARY F-PLN
- The ENABLE ALTN function
- The NEW DEST revision

EN ROUTE DIVERSION WITH SEVERAL AIRPORTS AVAILABLE

– SELECT the CLOSEST AIRPORTS page.



NFCS-04-0403-006-A110AA

CLOSEST AIRPORTS
PAGE 2

– SELECT the EFOB/WIND prompt.

– INSERT the effective wind at selected airport.

– CHECK the predictions and CHOOSE the adequate diversion airport.

– PREPARE the diversion flight plan on the secondary flight plan.

Note : Fuel/time predictions on CLOSEST AIRPORTS page assume managed speed profile.

CLEAR KEY (CLEARING FUNCTION)

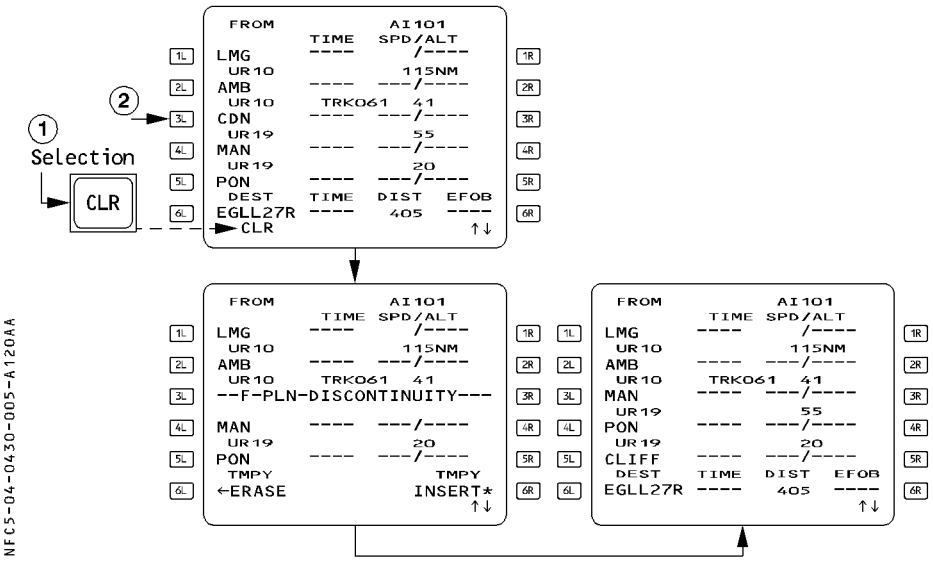
CLEARING THE SCRATCHPAD OF DATA OR MESSAGES

Press the "CLR" key with a single brief touch to erase the last alphanumeric character inserted in the scratchpad.
Press the key for more than three seconds to erase all the data inserted in the scratchpad.
If the scratchpad is empty, it displays "CLR".

CLEARING DATA FIELDS

Clear a data field by pressing the "CLR" key, the scratchpad displays CLR, then select the prompt for the field you want to clear (3L for example). This results in the creation of a temporary F-PLN. The function has no effect on the active F-PLN until the temporary is inserted.

- You cannot clear all data fields :
  - If the field contains data that has a default value or a value computed by the FMGC, the data reverts to this value.
  - Any attempt to clear the defaulted value has no effect.
- Clearing a constraint on the F-PLN page deletes both the speed constraint and the altitude constraint associated with the waypoint.
- If you clear a data field that is a waypoint in the flight plan (primary or secondary), you delete this waypoint from the flight plan and create a discontinuity. The discontinuity can also be cleared in a similar way.



NFC5-04-0430-005-A120AA

HOW TO EXECUTE A DIVERSION

Various features are provided to help to the crew prepare, and perform a diversion :

- **The CLOSEST AIRPORTS PAGE**
- **The EQUI-TIME POINT function**
- **The secondary flight plan (SEC F-PLN)**
- **The ENABLE ALTN function**
- **The NEW DEST function**

DIVERSION TO A PREPLANNED ALTERNATE AIRPORT

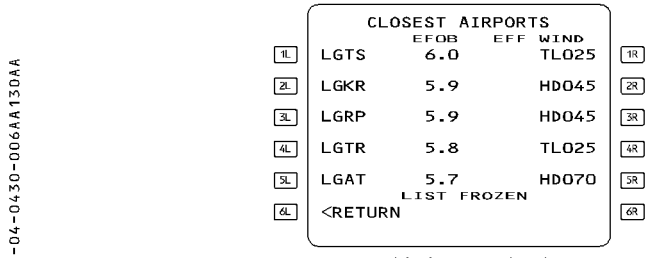
This would probably occur at the end of the cruise phase, during descent or go-around. The crew can use this method to divert if the active flight plan includes an alternate flight plan from destination to a pre–planned alternate airport.
To divert to the alternate airport from any point in the F-PLN, perform an "ENABLE ALTN" (enable alternate) revision :

- **SELECT "LAT REV" at a given waypoint**
- **PRESS the "ENABLE ALTN" key**
- **CHECK the temporary flight plan (TMPY F-PLN) and INSERT.**
- **USE the DIR TO function to go to the required waypoint.**

Note : In most cases, the LAT REV shall be selected at the TO waypoint. This will facilitate the subsequent selection of the DIR TO waypoint.

EN ROUTE DIVERSION WITH SEVERAL AIRPORTS AVAILABLE

– SELECT the CLOSEST AIRPORTS page.



CLOSEST AIRPORTS
PAGE 2

NFCS-04-0430-006AA13DAA

– SELECT the EFOB/WIND prompt, to access the CLOSEST AIRPORTS Page 2.

– CHECK/INSERT the effective wind at the selected airports.

– CHECK the predictions and CHOOSE the adequate diversion airport.

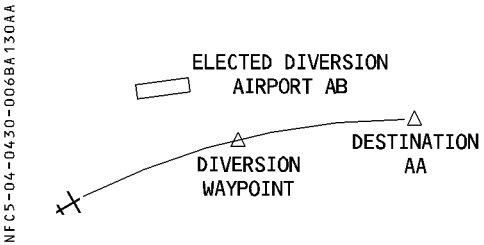
– PREPARE the diversion flight plan on the SEC F-PLN.

Note : Fuel/time predictions on the CLOSEST AIRPORTS page assume managed speed is used.

EN ROUTE DIVERSION OVER OCEANIC OR DESERTIC AREA

The diversion airports are usually determined before departure or using the CLOSEST AIRPORTS data.

– SELECT the EQUI-TIME POINT page.



EQUI-TIME POINT
A/C TO BRG DIST UTC
AA 029° 700 0945
TRU WIND ETP TO AA
230/025 003° 563 1015
AB 075° 1001 1012
TRU WIND ETP TO AB
280/100 077° 627 1015
ETP LOCATION
N52W025/-25.2
A/C TO DIST UTC
(ETP) 371 0803

EQUITIME POINT PAGE
(ETP COMPUTED)

– ENTER the airport idents in 1L and 3L fields.

– ENTER the associated winds in 2L and 4L fields.

– CHECK the ETP position and time.

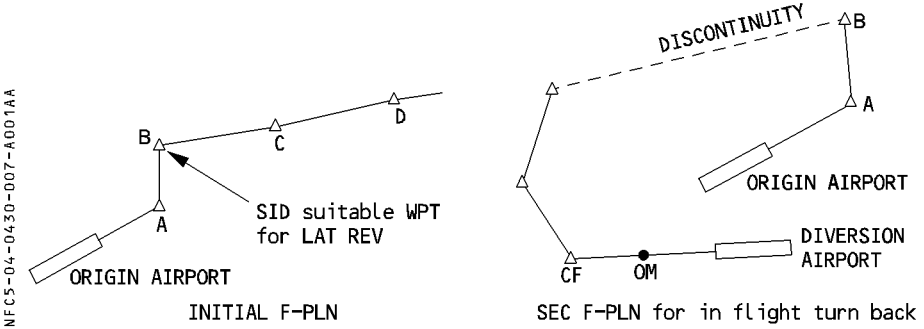
– ENTER a predicted time at ETP as time marker.

– PREPARE a diversion flight plan on the secondary flight plan.

USING THE SECONDARY FLIGHT PLAN FUNCTION

Use the SEC F-PLN function if a secondary flight plan for diversion has been prepared :

– **While the aircraft is on the ground,**
you have prepared the lateral path you would expect to use in case of an early in flight turn back (major failure after takeoff or during initial climbout), or the lateral path you would expect to use to land at a nearby diversion airport (weather at origin airport requires a takeoff alternate).



– **SELECT the "SEC F-PLN" key on the MCDU.**

– **DEPRESS the "COPY ACTIVE" key.**

– **SELECT "LAT REV" at a waypoint with a suitable SID.**

– **ENTER the ident of the diversion airport as the new destination.**

– **ENTER the expected approach and route.**

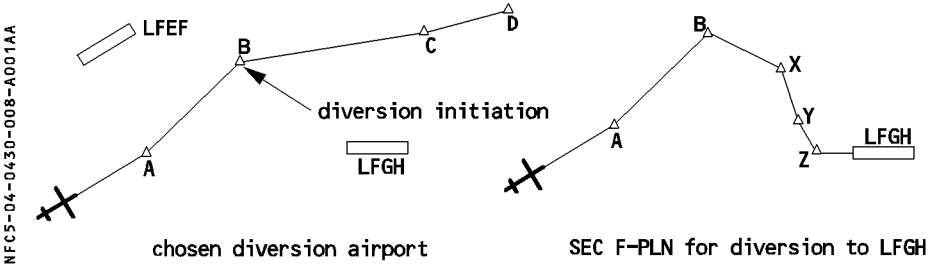
– **DEPRESS the PERF prompt on SEC INDEX page.**

– **SELECT the PERF APP page of the secondary F-PLN.**

– **ENTER the QNH and wind.**

– **SELECT the landing configuration.**

– **Once the aircraft is in the cruise phase,**
consider the adequate diversion airports as the aircraft proceeds along the route of the active flight plan : use the "EFIS AIRPORT" feature of the navigation display for this. Enter a diversion airfield as the destination for the secondary flight plan and adjust the routing (changing it as necessary as cruise phase progresses).



– **SELECT the "SEC F-PLN" function key on MCDU.**

– **PRESS the "COPY ACTIVE" key.**

– **SELECT "AIRPORT" on the EFIS control panel.**
Choose an adequate diversion airport and diversion initial waypoint.

– **SELECT "LAT REV" at the chosen waypoint.**

– **ENTER the new destination.**

– **MODIFY/COMPLETE the lateral flight plan.**

For both of these cases , initiate the diversion as follows :

– **SELECT the "SEC F-PLN" key on MCDU.**

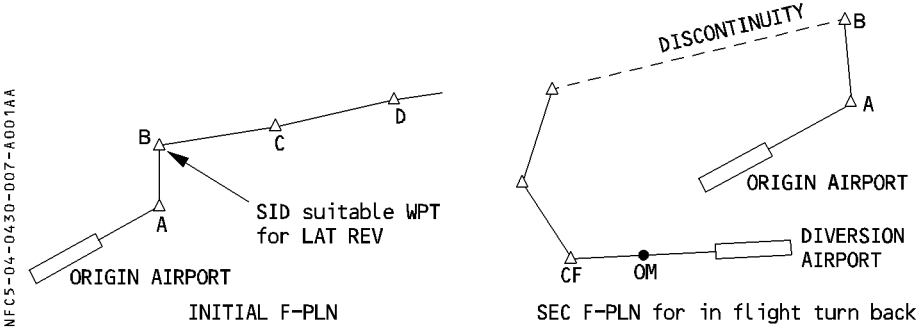
– **DEPRESS the "ACTIVE SEC" key.**

– **USE the DIR TO function to go to the waypoint of the new active flight plan.**

USING THE SECONDARY FLIGHT PLAN FUNCTION

Use the SEC F-PLN function if a secondary flight plan for diversion has been prepared :

– **While the aircraft is on the ground,**
you have prepared the lateral path you would expect to use in case of an early in flight turn back (major failure after takeoff or during initial climbout), or the lateral path you would expect to use to land at a nearby diversion airport (weather at origin airport requires a takeoff alternate).



– **SELECT the "SEC F-PLN" key on the MCDU.**

– **DEPRESS the "COPY ACTIVE" key.**

– **SELECT "LAT REV" at a waypoint with a suitable SID.**

– **ENTER the ident of the diversion airport as the new destination.**

– **ENTER the expected approach and route.**

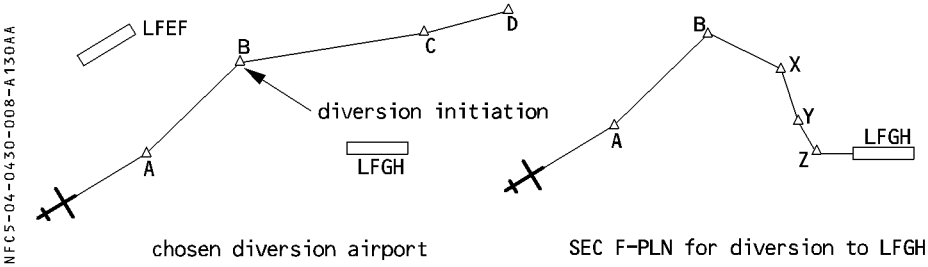
– **DEPRESS the PERF prompt on SEC INDEX page.**

– **SELECT the PERF APP page of the secondary F-PLN.**

– **ENTER the QNH and wind.**

– **SELECT the landing configuration.**

– **To prepare a diversion, in cruise phase :**
The flight crew should consider the adequate diversion airports as the aircraft proceeds along the route of the active flight plan. For this purpose, the CLOSEST AIRPORTS page, EQUI-TIME POINT function, or EFIS "Airports" feature on the ND may be used.
Once selected, the flight crew should enter the diversion airport as the destination of the secondary flight plan, and adjust the routing as required.



– **SELECT the "SEC F-PLN" function key on MCDU.**

– **PRESS the "COPY ACTIVE" prompt.**

– **USE the CLOSEST AIRPORTS page, the EQUI-TIME POINT function, or the "AIRPORT" display on the ND.**
Choose an adequate diversion airport and diversion initial waypoint.

– **SELECT "LAT REV" at the chosen waypoint.**

– **ENTER the new destination (NEW DEST field).**

– **MODIFY/COMPLETE the lateral flight plan.**

– **To initiate the prepared diversion :**
The flight crew may initiate the diversion prepared in the SEC F-PLN, as follows :

– **SELECT the "SEC F-PLN" key on the MCDU.**

– **PRESS the "ACTIVATE SEC" prompt [4L].**

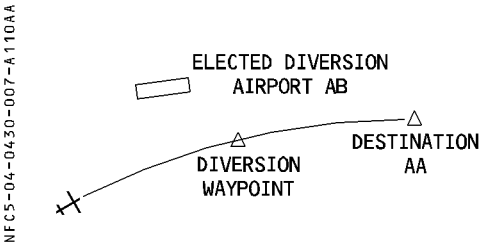
– **PERFORM a DIR TO to the desired waypoint in the new active flight plan.**

EN ROUTE DIVERSION OVER OCEANIC OR DESERTIC AREA

The diversion airports are usually determined prior to departure or using the CLOSEST AIRPORTS data.

– SELECT the EQUITIME POINT page.

R



EQUI-TIME POINT

	A/C TO BRG DIST UTC	
1L	AA 029° 700 0945	1R
	TRU WIND ETP TO AA	
2L	230/025 003° 563 1015	2R
3L	AB 075° 1001 1012	3R
	TRU WIND ETP TO AB	
4L	280/100 077° 627 1015	4R
	ETP LOCATION	
5L	N52W025/-25.2	5R
	A/C TO DIST UTC	
6L	(ETP) 371 0803	6R

EQUITIME POINT PAGE
(ETP COMPUTED)

– ENTER the airport idents in 1L and 3L fields.

– ENTER the associated winds in 2L and 4L fields.

– CHECK the ETP position and time.

– ENTER a predicted time at ETP as time marker.

– PREPARE a diversion flight plan on the secondary flight plan.

DIVERSION PREPARATION ON THE SECONDARY FLIGHT PLAN

The following procedure shall be applied for all diversion cases, once the diversion airport has been selected, as well as the "most probable diversion point of the F-PLN" :

R — **PRESS the SEC F-PLN key**

— **PRESS the COPY ACTIVE prompt**

— **SELECT a lateral revision at diversion waypoint**

— **ENTER the ident of the diversion airport in the NEW DEST field.**
Then finalize the flight plan between the diversion point and the diversion airport. When the diversion airport is no longer applicable or ETP is sequenced, repeat the same procedure for the next diversion airport.

MISCELLANEOUS

In some cases, the diversion airport may be simply chosen using the airports displayed on ND when AIRPORT is selected on the EIS control panel.
During oceanic or desertic area flights, the flight crew may use the PROG page, as follows:

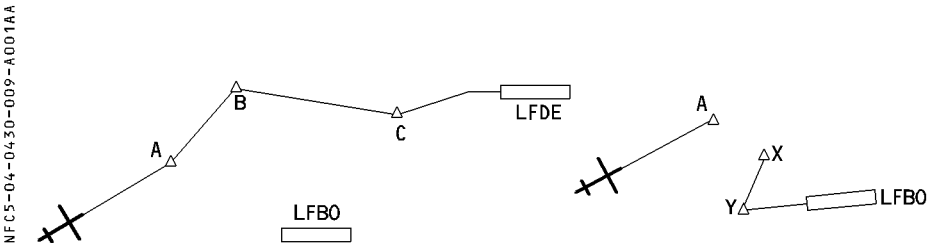
— **ENTER the ident of the diversion airport in the 4R field of MCDU 1**

— **ENTER the next diversion airport in the 4R field of MCDU 2**
Then, the FMS continuously calculated the BRG/DIST to the selected diversion airports.

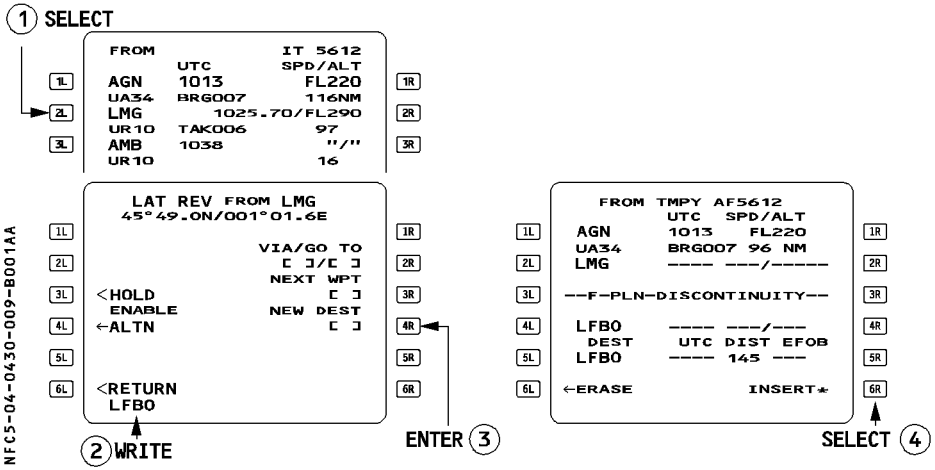
— **UPDATE the PROG pages when sequencing the ETP.**

USING NEW DESTINATION FUNCTION

If the pilot has not prepared a diversion in the secondary flight plan, the "NEW DEST" function allows to make the required change on the active flight plan.
Because the pilot will probably have to initiate the diversion quickly, the revision waypoint will probably be the "TO" waypoint.
You will have to adjust the resulting active flight plan in order to have proper routing to the destination and have the applicable performance data entered.



- **SELECT "LAT REV" at the "TO" waypoint.**
- **ENTER the ident for the new destination.**
- **INSERT the temporary flight plan.**
- **COMPLETE the lateral flight plan to the diversion**
- **ENTER performance data as applicable.**
- **When you initiate the diversion, use "DIR TO" the appropriate waypoint.**



EXECUTION OF THE DIVERSION

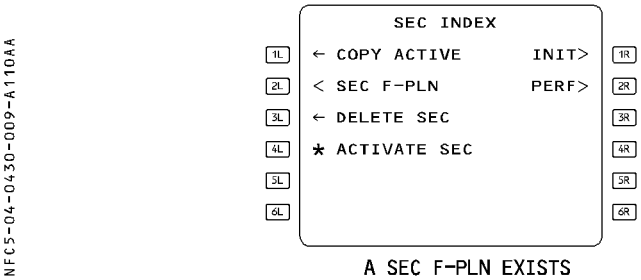
When the crew decides to divert :

– PRESS the SEC F-PLN key.

– SELECT the ACTIVATE SEC prompt.

– SELECT DIR TO required point.

R



DIVERSION TO THE ALTERNATE AIRPORT

The primary F-PLN includes an alternate flight plan from destination to the preferred
R alternate airport. All fuel prediction and management ((EXTRA fuel) take the alternate flight plan into consideration.
If the crew decides to divert at the end of the cruise, or beyond the last ETP, or in the descent or go-around phases, this will most probably be to the alternate airport.
When the crew decides to divert :

– SELECT a lateral revision at suitable waypoint

– SELECT ENABLE ALTN prompt

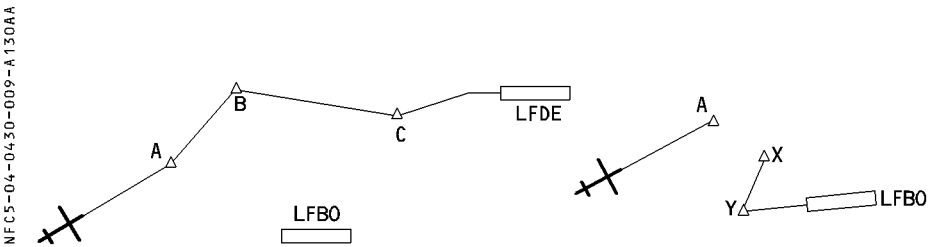
– CHECK the temporary flight plan and INSERT.

– SELECT DIR TO required waypoint.

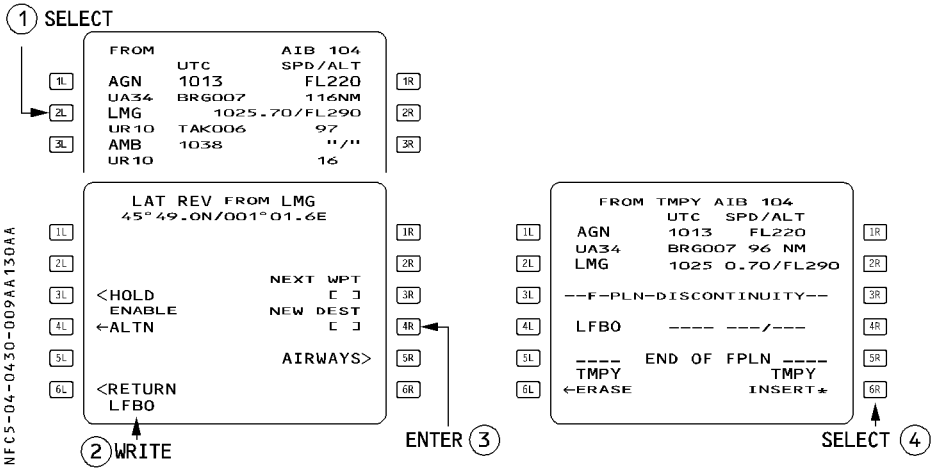
Note : – In most cases, the LAT REV shall be selected at the TO WPT. This will facilitate the subsequent selection of the DIR TO waypoint.
– The ALTN flight plan shall be finalized, whenever the landing runway is known by the crew (before approach briefing).
In most cases, this will ensure that the most probable flight plan is displayed on the MCDU once ENABLE ALTN is selected.

USING NEW DESTINATION FUNCTION

If the crew has not prepared a diversion in the SEC F-PLN, the "NEW DEST" function allows to make the required change on the active flight plan.
Because the crew will probably have to initiate the diversion quickly, the revision waypoint will probably be the "TO" waypoint.
The crew will have to adjust the resulting active flight plan in order to have the correct routing to destination and have the applicable performance data entered.



- **SELECT "LAT REV" at the "TO" waypoint.**
- **ENTER the ident for the new destination in the NEW DEST field (4R).**
- **In the TMPY F-PLN, COMPLETE the lateral flight plan to the diversion airport.**
- **CHECK the TMPY F-PLN, and INSERT.**
- **ENTER/CHECK performance data as applicable.**
- **When the diversion is initiated, USE a "DIR TO" to the appropriate waypoint.**



Note : The temporary flight plan is displayed if the new destination airport is either in the Navigation Database, or in the pilot-defined runway file. Otherwise, the NEW RUNWAY page will appear so that the pilot can store a new runway.

ENGINE OUT

When the FMGS detects an engine-out condition, the following occurs :

FLIGHT MANAGEMENT PART

- CLIMB mode, if active, reverts to OPEN CLIMB mode.
- The managed target speeds is immediately set to a value that depends upon the flight phase.
- All preselected speeds entered in the MCDU are deleted.
- Step climb (or step descent), if entered, is deleted.
- Predictions are lost (except in descent and approach phases). When they are lost, the prediction field shows dashes.
- Predictions on the secondary flight plan are lost, if it is a copy of the active flight plan.
- The PROG page shows the engine-out maximum recommended (E.O. MAX REC) altitude.
- The system automatically calls up the current performance page, which has the E.O. CLR (engine-out clear) prompt displayed in the 1R field (except during takeoff, before the diversion point is reached).
  If the crew presses the E.O. CLR, the 2 engine predictions and performance will be restored. Reverting back to one engine-out performance is not possible, unless the system detects a new E.O. condition. Therefore, the pilot should not press the E.O. CLR
R key, if an actual engine-out is detected.
- It is not permitted to use the autopilot to perform non precision approaches in engine-out in the following modes : FINAL APP, NAV V/S, NAV/FPA. Only FD use is authorized.

FLIGHT GUIDANCE PART

- All selected modes remain available (the "HDG/TRK", "V/S", and "OPEN" modes, for example).
- In the speed reference system (SRS) mode, the takeoff speed target is V2, or the current speed if it is higher. The magenta triangle indicates V2 in all cases.
- The system limits autopilot (AP) and flight director (FD) bank angles during takeoff and approach phases as follows :
  · 15° when the aircraft speed is below the maneuvering speeds (F, S, or Green Dot speed) – 10 kt
  · Then linear increase to 25° up to maneuvering speeds (F, S, or Green Dot speed) – 3 kt
  · 25° above maneuvering speeds (F, S, or Green Dot speed) – 3 kt.

  Note : The engine-out bank angle limits apply, when the FG part of the FMGS has detected an engine-out. It cannot be cleared by the crew through the MCDU E.O CLEAR prompt.

ENGINE OUT

When the FMGS detects an engine-out condition, the following occurs :

FLIGHT MANAGEMENT PART

- The managed target speed is immediately set to a value that depends upon the flight phase.
- All preselected speeds entered in the MCDU are deleted.
- Step climb (or step descent), if entered, is deleted.
- The time constraint is deleted
- The PROG page shows the engine-out maximum recommended (E.O. MAX REC) altitude.
- The system automatically calls up the current performance page, which has the E.O. CLR (engine-out clear) prompt displayed in the 1R field (except during takeoff, before the diversion point is reached).
  If the crew presses the E.O. CLR, the two-engine predictions and performance will be restored. Reverting back to one engine-out performance is not possible, unless the system detects a new E.O. condition. Therefore, the pilot should not press the E.O. CLR
R key if an actual engine-out is detected.
- It is not permitted to use the autopilot to perform non precision approaches in engine-out in the following modes : FINAL APP, NAV V/S, NAV/FPA. Only FD use is authorized.

FLIGHT GUIDANCE PART

- All selected modes remain available (the "HDG/TRK", "V/S", and "OPEN" modes, for example).
- In the speed reference system (SRS) mode, the takeoff speed target is V2, or the current speed if it is higher but no more than V2 + 15. The magenta triangle indicates V2 in all cases. The GO Around speed target is Vapp, or the current speed if higher, limited to VLS + 15 kts.
- The system limits autopilot (AP) and flight director (FD) bank angles during takeoff and approach phases as follows :
  · 15° when the aircraft speed is below the maneuvering speeds (F, S, or Green Dot speed) – 10 kt
  · Then linear increase to 25° up to maneuvering speeds (F, S, or Green Dot speed) – 3 kt
  · 25° above maneuvering speeds (F, S, or Green Dot speed) – 3 kt.

Note : The engine-out bank angle limits apply, when the FG part of the FMGS has detected an engine-out. It cannot be cleared by the crew through the MCDU E.O CLEAR prompt.

ENGINE OUT

When the FMGS detects an engine-out condition, the following occurs :

FLIGHT MANAGEMENT PART

- The managed target speeds is immediately set to a value that depends on the flight phase.
- The following pilot entries are deleted : preselected speeds, steps, time constraints.
- No predictions are available for the ALTN flight plan, and the associated fields are dashed. The default MIN DEST FOB value (ALTN + FINAL) will be subsequently affected.
- Predictions on the secondary flight plan are lost, if it is a copy of the active flight plan.
- The PROG page shows the engine-out maximum recommended (E.O. MAX REC) altitude.
- The system automatically calls up the current performance page, which has the E.O. CLR (engine-out clear) prompt displayed in the 1R field (except during takeoff, before the diversion point is reached).
  If the crew presses the E.O. CLR, the 2 engine predictions and performance will be restored. Reverting back to one engine-out performance is not possible, unless the system detects a new E.O. condition. Therefore, the pilot should not press the E.O. CLR
R key, if an actual engine-out is detected.
- It is not permitted to use the autopilot to perform non precision approaches in engine-out in the following modes : FINAL APP, NAV V/S, NAV/FPA. Only FD use is authorized.

FLIGHT GUIDANCE PART

- All selected modes remain available (the "HDG/TRK", "V/S", and "OPEN" modes, for example).
- In the speed reference system (SRS) mode, the takeoff speed target is V2, or the current speed if it is higher but not more than V2+15. The magenta triangle indicates V2 in all cases. The go-around speed target is Vapp, or the current speed if higher, but limited to VLS + 15 kts
- The system limits autopilot (AP) and flight director (FD) bank angles during takeoff and approach phases as follows :
  - 15° when the aircraft speed is below the maneuvering speeds (F, S, or Green Dot speed) – 10 kt
  - Then linear increase to 25° up to maneuvering speeds (F, S, or Green Dot speed) – 3 kt
  - 25° above maneuvering speeds (F, S, or Green Dot speed) – 3 kt.

Note : The engine-out bank angle limits apply, when the FG part of the FMGS has detected an engine-out. It cannot be cleared by the crew through the MCDU E.O CLEAR prompt.

AUTOTHRUST

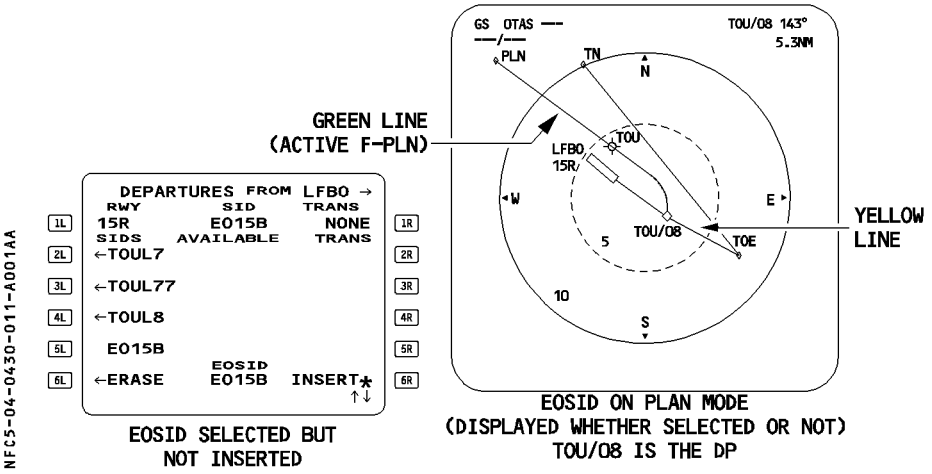
The system extends the active range of the active engine from idle to maximum continuous thrust (MCT instead of CL thrust).
The Flight Mode Annunciator requests maximum continuous thrust on the live engine at a time that depends on when the engine-out occurs.

ENGINE-OUT CONDITIONS

The FMGS considers the aircraft to be in an engine-out condition, when one of the following conditions is present and the aircraft has commenced takeoff or is in flight :
- One engine master switch off, or
- N2 below idle, or
- One thrust lever angle is below 5° with the other above 22°, or
- The FADEC shows an engine fault.

ENGINE-OUT SID

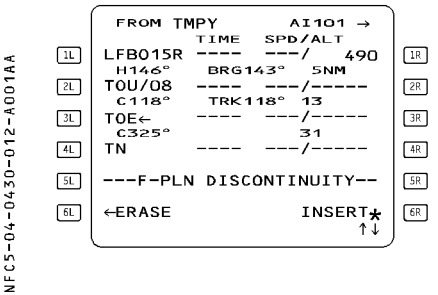
An engine-out standard instrument departure (EOSID), when defined in the database, is always for a specific runway. It is indicated on the bottom line of the SID page for that runway, and you can select it manually.
The pilot can review the SID either by selecting the PLAN mode on the navigation display (solid yellow line), or by selecting it on the SID page. In the latter case, the navigation display shows the SID as a temporary flight plan.
The last point, if any, that is common to both the SID and engine-out SID is called the diversion point (DP).

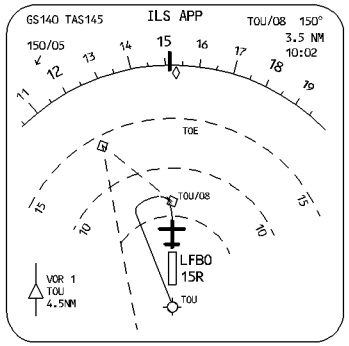


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WHEN AN ENGINE-OUT CONDITION OCCURS BEFORE THE DIVERSION POINT

The MCDU automatically shows the engine-out SID as a temporary flight plan on the F-PLN page and on the ND. The EOSID can be inserted or erased.





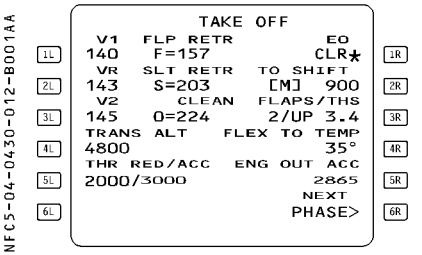
active F-PLN in green solid line
EOSID in dashed yellow line

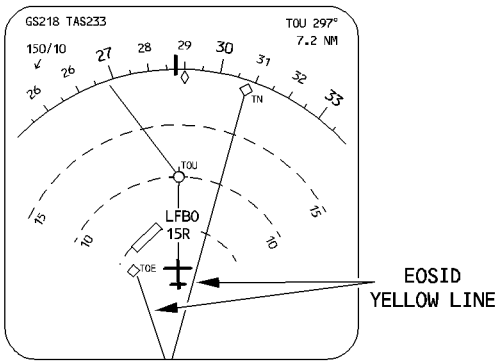
WHEN AN ENGINE-OUT CONDITION OCCURS AFTER THE DIVERSION POINT

The navigation display shows the engine-out SID as a yellow line for your information. If necessary :

– SELECT "DIR TO" a waypoint on the engine-out SID flight plan

– ADJUST the flight plan that results.





AUTOTHRUST

The system extends the active range of the active engine from idle to maximum continuous thrust (MCT instead of CL thrust).
The Flight Mode Annunciator requests maximum continuous thrust on the live engine at a time that depends on when the engine-out occurs.

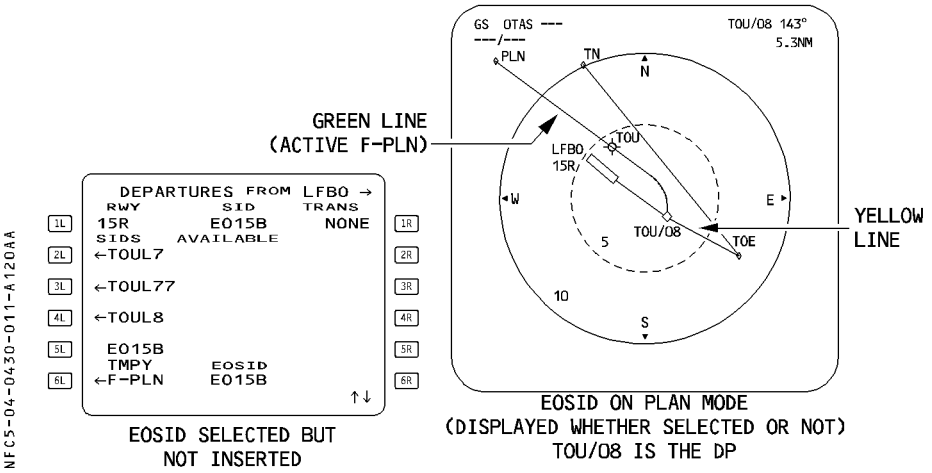
ENGINE-OUT CONDITIONS

The FMGS considers the aircraft to be in an engine-out condition, when one of the following conditions is present and the aircraft has commenced takeoff or is in flight :

- One engine master switch off for CFM engines, one engine shut down for IAE engines, or
- N2 below idle, or
- One thrust lever angle is below 5° with the other above 22°, or
- The FADEC shows an engine fault.

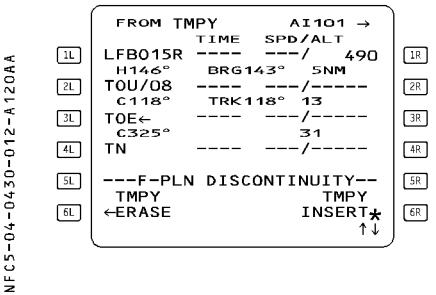
ENGINE-OUT SID

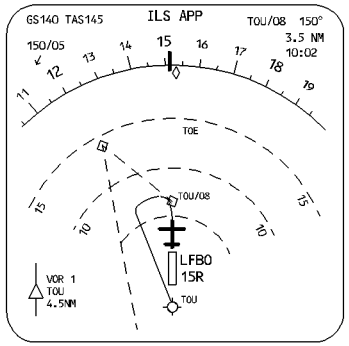
An engine-out standard instrument departure (EOSID), when defined in the database, is always for a specific runway. It is indicated on the bottom line of the SID page for that runway, and you can select it manually.
The pilot can review the SID either by selecting the PLAN mode on the navigation display (solid yellow line), or by selecting it on the SID page. In the latter case, the navigation display shows the SID as a temporary flight plan.
The last point, if any, that is common to both the SID and engine-out SID is called the diversion point (DP).



WHEN AN ENGINE-OUT CONDITION OCCURS BEFORE THE DIVERSION POINT

The MCDU automatically shows the engine-out SID as a temporary flight plan on the F-PLN page and on the ND. The EOSID can be inserted or erased.



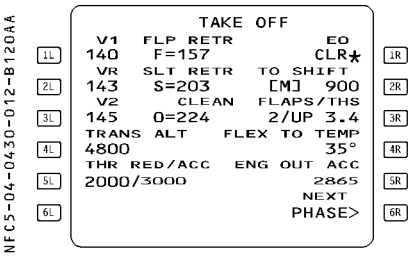


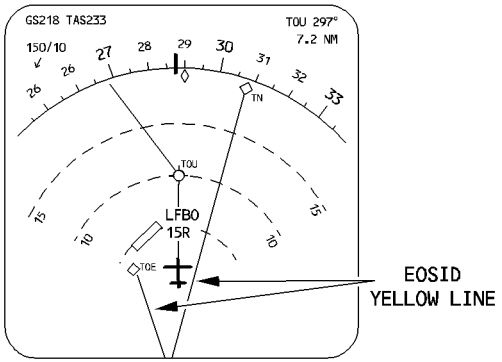
active F-PLN in green solid line
EOSID in dashed yellow line

WHEN AN ENGINE-OUT CONDITION OCCURS AFTER THE DIVERSION POINT

The navigation display shows the engine-out SID as a yellow line for your information. If necessary :

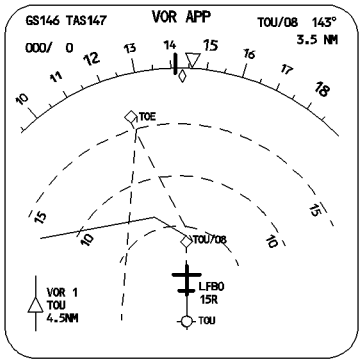
– USE the "DIR TO" function to a waypoint on the engine-out SID flight plan.





BELOW THRUST-REDUCTION (THR RED) ALTITUDE

* The managed target speed changes to V2.
* The PROG page displays the engine-out maximum recommended altitude.
* The PERF TO page comes up on the display automatically with the "EO CLR" prompt in the 1R field.
* The MCDU and the navigation display show the engine-out SID as a temporary flight plan, or the navigation display shows it for information only, depending upon the diversion point location.



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Procedure

When the aircraft reaches the engine-out acceleration altitude

– PUSH in the V/S knob to level off.

– CLEAN up your configuration as the speed increases toward target speed.

When the aircraft is clean and has reached Green Dot speed, "LVR MCT" flashes on the FMA,

– PULL out the altitude selector knob to resume the climb.

R The OP CLB mode engages.

– MOVE the thrust lever for the live engine to "MCT" detent.

ABOVE THRUST REDUCTION (THR RED) ALTITUDE

* The managed target speed changes to V2.
* "LVR MCT" flashes white on the flight mode annunciator.
* The PROG page displays the engine-out maximum recommended altitude.
* The PERF TO page displays the "EO CLR*" prompt in the 1R field.
* The navigation display shows the EOSID.

Procedure

– MOVE the thrust lever of the active engine to the MCT detent.

R ● **When the aircraft reaches the engine-out acceleration altitude :**

R **– PUSH the V/S knob to level off.**

– CLEAN UP configuration as the speed increases.

R ● **When the aircraft reaches Green Dot speed :**

– PULL the ALT knob to resume the climb.

Note : – If necessary, move the thrust lever of the active engine to the TOGA detent. The Flight Mode Annunciator will display "LVR MCT", flashing in white, when the aircraft reaches Green Dot speed.

ENGINE-OUT IN CLB PHASE (above acceleration altitude)

ENGINE-OUT OCCURS WHILE AIRCRAFT IS ACTUALLY CLIMBING

* The managed target speed changes to Green Dot speed.
* "LVR MCT" flashes in white on the Flight Mode Annunciator.
* The climb mode reverts to open climb (OP CLB), and the aircraft slowly decelerates down to Green Dot speed.
* The MCDU displays the PERF CLB page with an "EO CLR*" (clear engine-out) prompt.
* The PROG page displays the Engine-Out Maximum Recommended Altitude (EO MAX REC ALT).

Procedure

– MOVE the thrust lever of the active engine to the MCT detent.

– SET the altitude on the Flight Control Unit to an altitude below the engine-out maximum recovery altitude, as cleared by ATC.

– INITIATE a diversion, when cleared to do so.

ENGINE-OUT OCCURS WHILE THE AIRCRAFT IS FLYING IN ALT MODE AT AN ALTITUDE SET ON THE FLIGHT CONTROL UNIT

* The target speed is set to engine-out cruise speed (EO CRZ SPD), computed at the altitude set on the Flight Control Unit, but limited by the limit speed (SPD LIM), if there is one.
  Other consequences and procedures are similar to previous engine out climb.

ENGINE-OUT IN CRUISE PHASE

* The system sets the managed target speed to the higher of engine-out cruise Mach number or speed, or current speed.
* "LVR MCT" (or MCT) flashes on the Flight Mode Annunciator.
* The PERF CRZ page appears with the "EO CLR*" (clear engine-out) prompt.
* The PROG page displays the engine-out maximum recommended altitude (EO MAX REC ALT).

Procedure

R **— Perform engine out abnormal procedure.**

R **— Refer to FCOM Vol 3 "SINGLE ENGINE OPERATIONS"**
R * For standard strategy, use Chapter 3.06.30
R * For obstacle strategy, use Chapter 3.06.40
R * For fixed strategy, use Chapter 3.06.50

R **— Initiate a diversion if necessary.**

R *Note : The engine-out descent strategy requires disconnection of the autothrust, and*
R *descent in OPEN DES mode.*
R *Disconnecting the autothrust prevents an automatic setting of THR IDLE ; therefore,*
R *the autopilot will fly the target speed in OP DES mode, with a thrust manually*
R *selected by the crew.*
R *When reaching the FCU-selected altitude, or whenever normal descent is resumed*
R *to a lower altitude, reengage the autothrust.*

ENGINE OUT IN DESCENT PHASE

* The managed target speed remains unchanged (ECON DES Mach number or speed, with any speed limitations).
* "LVR MCT" (or MCT) flashes on the Flight Mode Annunciator.
* The PERF DES page appears, showing the "EO CLR*" prompt.
* The PROG page displays the engine-out maximum recommended altitude (EOMAX REC ALT).

R * The descent mode (if engaged) reverts to V/S, if the aircraft is above the EO REC MAX.
R If not, the descent mode is maintained.

Procedure

– MOVE the thrust lever for the live engine to the MCT detent.

– If necessary, SELECT a suitable flight mode for descent.

– DISCONNECT the autothrust and ADJUST thrust if necessary.

ENGINE-OUT IN APPROACH PHASE

* The aircraft maintains approach speed (VAPP).
* "LVR MCT"(or MCT) flashes on the Flight Mode Annunciator.
* The PERF APPR page appears, showing the "EO CLR*" prompt.
* The PROG page displays the engine-out maximum recommended altitude (EO MAX REC ALT).

Procedure

– MOVE the thrust lever for the live engine to the MCT detent.

CAUTION

R Below maneuvering speed (F, S, Green Dot) – 10 kt, the autopilot or flight
R director (AP/FD) cannot order a bank angle greater than 15°.
R Above maneuvering speed – 10 kt, this limit linerarly increases until it reaches
R 25° at maneuvering speed – 3 kt. The limit is then 25° for all speeds above
R maneuvering speed – 3 kt.

ENGINE-OUT IN GO-AROUND PHASE

The results and procedures for takeoff phase apply, except that the displays do not show the engine-out SID.

ENGINE-OUT OCCURS WHILE THE AIRCRAFT IS FLYING IN ALT MODE AT AN ALTITUDE SET ON THE FLIGHT CONTROL UNIT

* The target speed is set to engine-out cruise speed (EO CRZ SPD), computed at the altitude set on the Flight Control Unit, but limited by the limit speed (SPD LIM), if there is one.
  Other consequences and procedures are similar to previous engine out climb.

ENGINE-OUT IN CRUISE PHASE

* The system sets the managed target speed to the higher of engine-out cruise Mach number or speed, or current speed.
* "LVR MCT" (or MCT) flashes on the Flight Mode Annunciator.
* The PERF CRZ page appears with the "EO CLR*" (clear engine-out) prompt.
* The PROG page displays the engine-out maximum recommended altitude (EO MAX REC ALT).

Procedure

R **– Perform engine out abnormal procedure.**

R **– Refer to FCOM Vol 3 "SINGLE ENGINE OPERATIONS"**
R * For standard strategy, use Chapter 3.06.30
R * For obstacle strategy, use Chapter 3.06.40
R * For fixed strategy, use Chapter 3.06.50

R **– Initiate a diversion if necessary.**

R *Note : The engine-out descent strategy requires disconnection of the autothrust, and*
R *descent in OPEN DES mode.*
R *Disconnecting the autothrust prevents an automatic setting of THR IDLE ; therefore,*
R *the autopilot will fly the target speed in OP DES mode, with a thrust manually*
R *selected by the crew.*
R *When reaching the FCU-selected altitude, or whenever normal descent is resumed*
R *to a lower altitude, reengage the autothrust.*

ENGINE OUT IN DESCENT PHASE

* Managed speed must not be used. The flight crew must use selected speed until approach phase activation.
* "LVR MCT" (or MCT) flashes on the Flight Mode Annunciator.
* The PERF DES page appears, showing the "EO CLR*" prompt.
* The PROG page displays the engine-out maximum recommended altitude (EO MAX REC ALT).

R * The descent mode (if engaged) reverts to V/S, if the aircraft is above the EO REC MAX.
R If not, the descent mode is maintained.

Procedure

– MOVE the thrust lever for the live engine to the MCT detent.

– If necessary, SELECT a suitable flight mode for descent.

– DISCONNECT the autothrust and ADJUST thrust if necessary.

ENGINE-OUT IN APPROACH PHASE

* The aircraft maintains approach speed (VAPP).
* "LVR MCT"(or MCT) flashes on the Flight Mode Annunciator.
* The PERF APPR page appears, showing the "EO CLR*" prompt.
* The PROG page displays the engine-out maximum recommended altitude (EO MAX REC ALT).

Procedure

– MOVE the thrust lever for the live engine to the MCT detent.

CAUTION

R Below maneuvering speed (F, S, Green Dot) – 10 kt, the autopilot or flight
R director (AP/FD) cannot order a bank angle greater than 15°.
R Above maneuvering speed – 10 kt, this limit linerarly increases until it reaches
R 25° at maneuvering speed – 3 kt. The limit is then 25° for all speeds above
R maneuvering speed – 3 kt.

ENGINE-OUT IN GO-AROUND PHASE

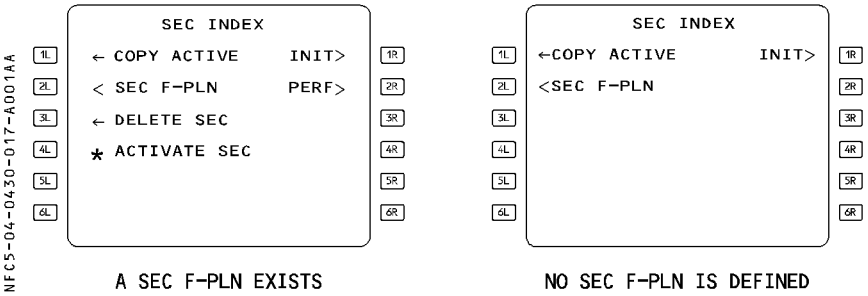
The results and procedures for takeoff phase apply, except that the displays do not show the engine-out SID.

Note : If a speed constraint, lower than Green Dot, exists in the Missed Approach procedure, the speed target displayed on the PFD speed scale, when leaving the SRS mode, will be this speed constraint.

SECONDARY FLIGHT PLAN

The secondary flight plan is an alternative flight plan that you can activate when required. It may include all the vertical elements except history wind.
With respect to the secondary flight plan, you can :

- Construct it independently.
- Copy it from the active flight plan.
- Delete it completely.
- Activate it as primary flight plan using ACTIVATE SEC prompt.



- The screen displays the "ACTIVATE SEC" prompt in flight :
  - when the heading (track) mode is engaged, or
  - when the navigation mode is engaged if the active legs of the primary and secondary flight plans are common.
- The screen displays the "INIT" prompt if the secondary flight plan is not a copy of the active flight plan.
  The secondary flight plan sequences with the active flight plan when it is a copy of the active.

The navigation display shows the secondary flight plan in white.

- In PLAN mode you can use the slew keys to review it (as you would for the primary flight plan).

Predictions

The system computes predictions using the same performance methods and performance factor it uses for the active flight plan. However, it predicts pseudo waypoints only for the
R MCDU, not for the Navigation Display (ND).

– Computation of predictions when the secondary flight plan is a copy active of the primary

The predictions are computed in the following cases :

· during preflight if the origin airports are similar (takeoff runway may be different)
· during takeoff, climb, or cruise phase if the active leg is also the first leg of the secondary.
· until the top of descent is reached. (Top of descent of primary or secondary, whichever comes first).

After top of descent, secondary predictions are lost when the systems detects an engine failure.

– The pilot may use the secondary flight plan in the following situations :

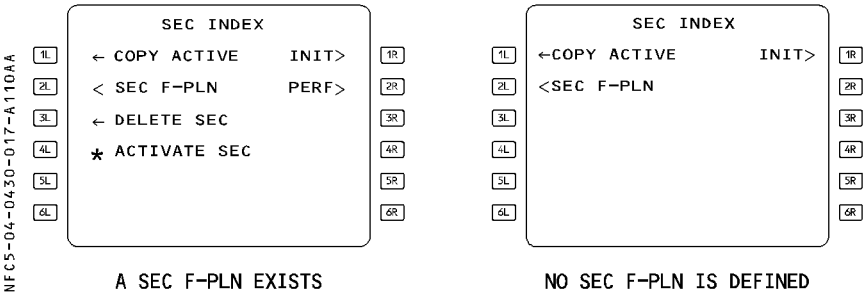
· At takeoff when an alternate takeoff runway is probable.
· In flight to prepare a diversion.
· In flight when an alternate landing runway is probable.
· To prepare the next flight.

Note : The procedures used for the secondary flight plan are similar to those of the active flight plan.

SECONDARY FLIGHT PLAN

The secondary flight plan is an alternative flight plan that you can activate when required. It may include all the vertical elements except history wind.
With respect to the secondary flight plan, you can :

- Construct it independently (it can be created while a temporary exists).
- Copy it from the active flight plan.
- Delete it completely.
- Activate it as primary flight plan using ACTIVATE SEC prompt.



- The screen displays the "ACTIVATE SEC" prompt in flight :
  · when the heading (track) mode is engaged, or
  · when the navigation mode is engaged if the active legs of the primary and secondary flight plans are common.
- The screen displays the "INIT" prompt if the secondary flight plan is not a copy of the active flight plan.
  The secondary flight plan sequences with the active flight plan when it is a copy of the active.

The navigation display shows the secondary flight plan in white.
· In PLAN mode you can use the slew keys to review it (as you would for the primary flight plan).

Predictions

The system computes predictions using the same performance methods and performance factor it uses for the active flight plan. However, it predicts pseudo waypoints only for the
R MCDU not for the Navigation Display (ND).

Use of secondary flight plan

The pilot will use the secondary flight plan in the following situations :
* When an alternate runway is probable
* To plan a diversion
* To prepare the next flight
* To compare predictions and evaluation.

– Computation of predictions when the secondary flight plan is a copy active of the primary

The predictions are computed in the following cases :

· during preflight if the origin airports are similar (takeoff runway may be different)

· during takeoff, climb, or cruise phase if the active leg is also the first leg of the secondary.

· until the top of descent is reached. (Top of descent of primary or secondary, whichever comes first).

After top of descent, secondary predictions are lost when the systems detects an engine failure.

– The pilot may use the secondary flight plan in the following situations :

· At takeoff when an alternate takeoff runway is probable.

· In flight to prepare a diversion.

· In flight when an alternate landing runway is probable.

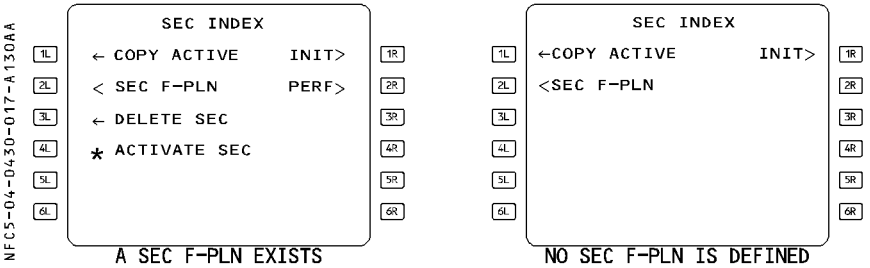
· To prepare the next flight.

Note : The procedures used for the secondary flight plan are similar to those of the active flight plan.

SECONDARY FLIGHT PLAN

The secondary flight plan (SEC F-PLN) is an alternative flight plan which can be activated when required.
It may include all the vertical elements except history wind data.
The flight crew can :

- Create a secondary flight independently from the active flight plan (a secondary flight plan can be created while a temporary flight plan exists).
- Copy it from the active flight plan.
- Activate it, when the "ACTIVATE SEC" prompt is displayed : The secondary flight plan becomes the active flight plan.



- The screen displays the "ACTIVATE SEC" prompt in flight if :
  · HDG (or TRK) mode is engaged, or
  NAV mode is engaged, and the active leg of the primary and secondary flight plans are common.

The FMS sequences the secondary flight plan the same way as the active flight plan, when it is a copy of the active flight plan.
The navigation display shows the secondary flight plan in white.
· In PLAN mode, the crew can use the slew keys to review the secondary flight plan (as for the primary flight plan).

Predictions

The FMGS computes predictions using the same performance methods and performance factor as for the active flight plan. However, it predicts pseudo-waypoints only for display the MCDU, and not for the Navigation Display (ND).
The FMGS does not provide any prediction in the secondary flight plan for the DESCENT, APPROACH and GO AROUND phases.

Use of the secondary flight plan

The crew may use the secondary flight plan in the following situations :

* When an alternate routing or runway change is likely
* To plan a diversion
* To prepare the following flight
* To compare predictions and evaluation.

— **Computation of predictions when the secondary flight plan is a copy active of the primary**

The predictions are computed in the following cases :

· during preflight if the origin airports are similar (takeoff runway may be different)

· during takeoff, climb, or cruise phase if the active leg is also the first leg of the secondary.

· until the top of descent is reached. (Top of descent of primary or secondary, whichever comes first).

After top of descent, secondary predictions are lost when the systems detects an engine failure.

— **The pilot may use the secondary flight plan in the following situations :**

· At takeoff when an alternate takeoff runway is probable.

· In flight to prepare a diversion.

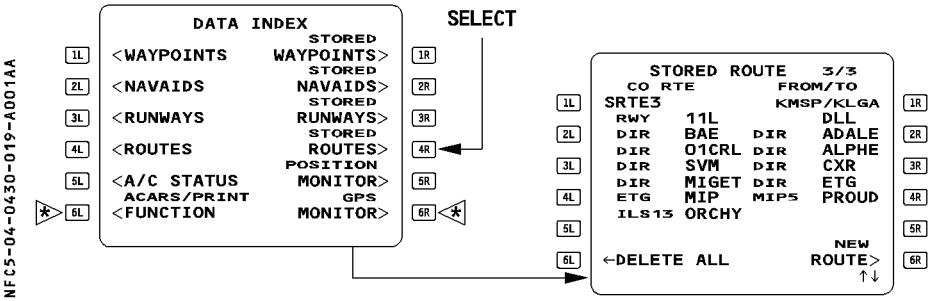
· In flight when an alternate landing runway is probable.

· To prepare the next flight.

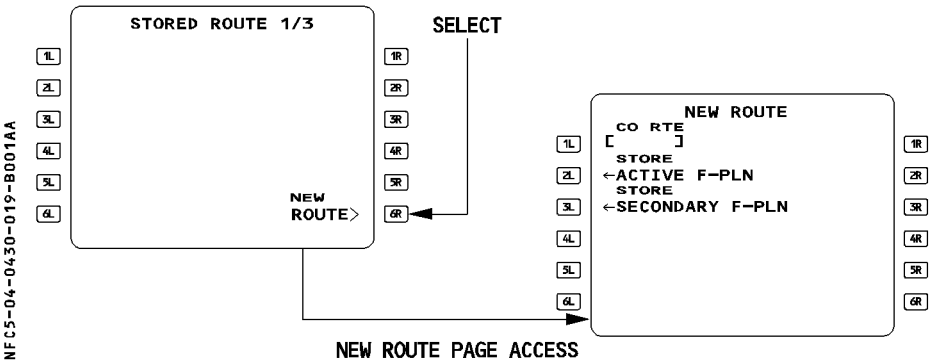
Note : The procedures used for the secondary flight plan are similar to those of the active flight plan.

STORED ROUTE FUNCTION

The stored route function allows the pilot to store or review as many as three different routes defined in an active or secondary flight plan.
This also allows you to store a company route that is not yet in the database but is expected to be flown several times (a charter route, for example).
Access the STORED ROUTES page from the DATA INDEX page.



A stored route can be reviewed by using the slew key.
In order to store a new route, first define the route through the active flight plan (on the ground only) or the secondary flight plan (on the ground or in flight) then proceed as described below.



HOW TO STORE THE ACTIVE FLIGHT PLAN (DURING PREFLIGHT ONLY)

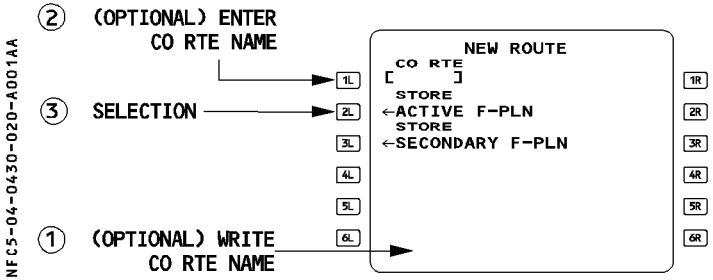
– SELECT the DATA key on MCDU

– PRESS the “STORED ROUTES” key

– PRESS the “NEW ROUTE” key

– ENTER the name of the company route (optional).

– PRESS the “STORE ACTIVE F-PLN” key



HOW TO STORE THE SECONDARY FLIGHT PLAN

– SELECT the DATA key on MCDU

– PRESS the “STORED ROUTES” key

– PRESS the “NEW ROUTE” key

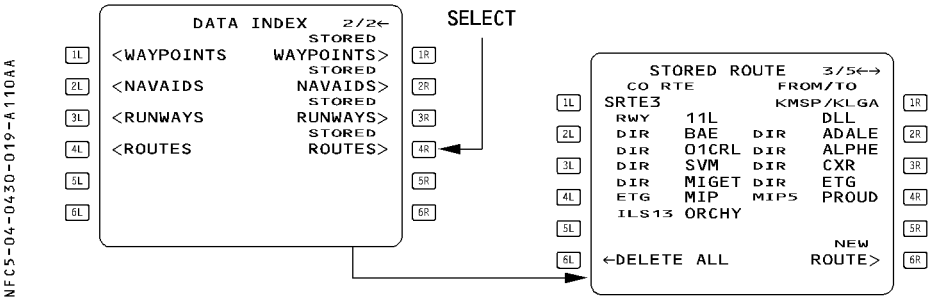
– ENTER the company route name (optional)

– PRESS the “STORE SECONDARY F-PLN” key

STORED ROUTE FUNCTION

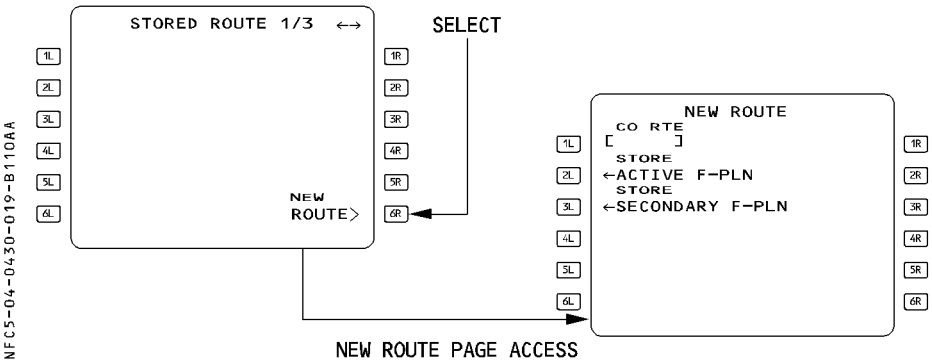
The stored route function allows the pilot to store or review as many as five different routes defined in an active or secondary flight plan.
This also allows the pilot to store a company route that is not yet in the database, but is expected to be flown several times (a charter route, for example).
Access the STORED ROUTES page from the DATA INDEX page.

R



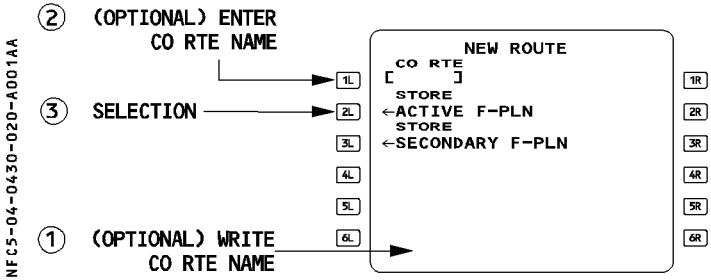
A stored route can be reviewed by using the slew key.
In order to store a new route, first define the route through the active flight plan (on the ground only), or the secondary flight plan (on the ground or in flight), then proceed as described below.

R



HOW TO STORE THE ACTIVE FLIGHT PLAN (DURING PREFLIGHT ONLY)

- SELECT the DATA key on MCDU
- PRESS the “STORED ROUTES” key
- PRESS the “NEW ROUTE” key
- ENTER the name of the company route (optional).
- PRESS the “STORE ACTIVE F-PLN” key

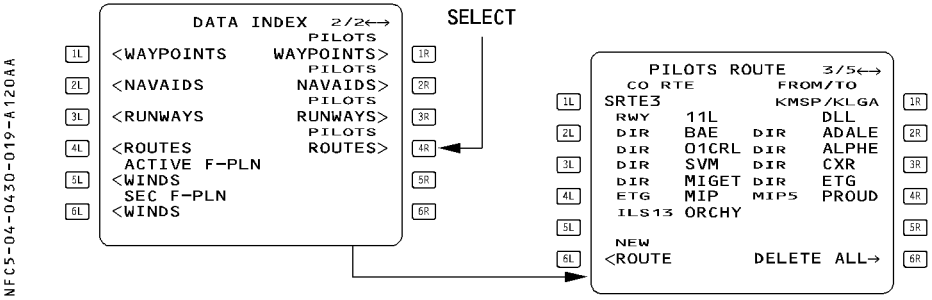


HOW TO STORE THE SECONDARY FLIGHT PLAN

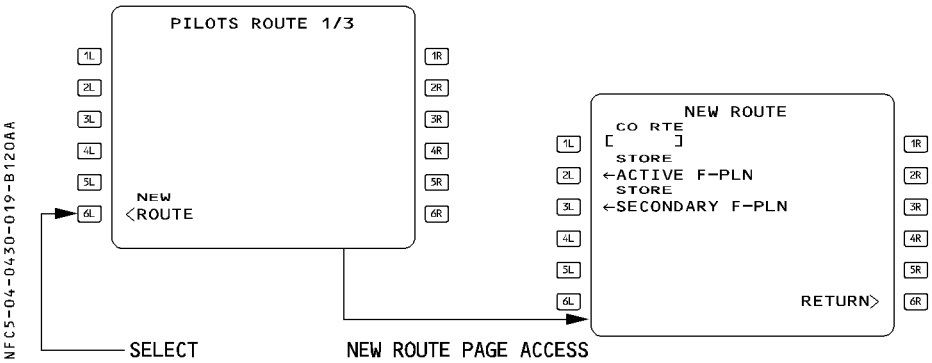
- SELECT the DATA key on MCDU
- PRESS the “STORED ROUTES” key
- PRESS the “NEW ROUTE” key
- ENTER the company route name (optional)
- PRESS the “STORE SECONDARY F-PLN” key

PILOTS ROUTE FUNCTION

The pilot's route function allows the pilot to store or review as many as five different routes defined in an active or secondary flight plan.
This also allows the pilot to store a company route that is not yet in the database, but is expected to be flown several times (a charter route, for example).
Access the PILOTS ROUTES page from the DATA INDEX page.

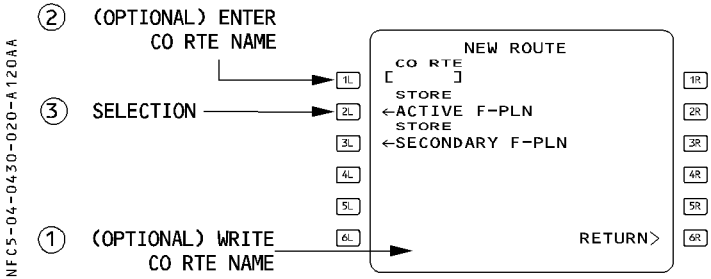


A stored route can be reviewed by using the slew key.
In order to store a new route, first define the route through the active flight plan (on the ground only), or the secondary flight plan (on the ground or in flight), then proceed as described below.



HOW TO STORE THE ACTIVE FLIGHT PLAN (DURING PREFLIGHT ONLY)

- SELECT the DATA key on MCDU
- PRESS the “PILOTS ROUTES” key
- PRESS the “NEW ROUTE” key
- ENTER the name of the company route (optional).
- PRESS the “STORE ACTIVE F-PLN” key



HOW TO STORE THE SECONDARY FLIGHT PLAN

- SELECT the DATA key on MCDU
- PRESS the “PILOTS ROUTES” key
- PRESS the “NEW ROUTE” key
- ENTER the company route name (optional)
- PRESS the “STORE SECONDARY F-PLN” key

Note : 1. In either case, you may only store a company route if the active or secondary flight plan is complete from origin to destination.

R *2. If you do not enter a name, the FMGS automatically names the stored route as "SRTE 1 (or 2 or 3)" when it is stored.*

3. The system does not retain several elements of the flight plans, when they are stored :

- *Pilot-entered holds*
- *Offsets*
- *Pilot-entered constraints*
- *Modifications to a terminal procedure*
- *Pseudo waypoints*

When this happens, it displays "REVISIONS NOT STORED".

R *4. If three routes are already stored the system will reject a new entry and display*
R *"STORED ROUTES FULL" on the MCDU. Delete one stored route by clearing the CO RTE name before inserting a new one.*

Note : 1. In either case, you may only store a company route if the active or secondary flight plan is complete from origin to destination.

R *2. If you do not enter a name, the FMGS automatically names the stored route as "SRTE 1 (or 2 ...)", when it is stored.*

3. The system does not retain several elements of the flight plans, when they are stored :
- *Pilot-entered holds*
- *Offsets*
- *Pilot-entered constraints*
- *Modifications to a terminal procedure*
- *Pseudo waypoints*

When this happens, it displays "REVISIONS NOT STORED".

4. If five routes are already stored, the system will reject a new entry and display
R *"STORED ROUTES FULL" on the MCDU. Delete a stored route by clearing the CO RTE name before inserting a new one.*

EQUITIME POINT

The equitime point page displays the ETP, computed along the F-PLN route between two referenced positions (airports, waypoints or navaids), defined by the pilot (Refer to 4.03.25 for the page description).

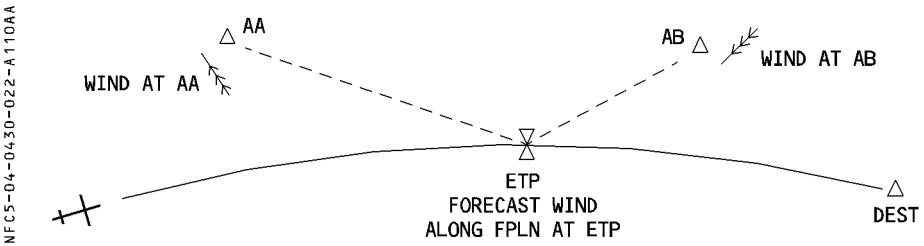
When first accessing the page, the FM proposes origin and destination airfields, as defaulted positions.

The pilot may overwrite these two positions and insert the wind in their vicinity at the applicable CRZ FL.

The FM then computes the resulting ETP, using the managed or selected speed, and blending the forecasted winds along the F-PLN route with the inserted winds.

The FM provides :

- TIME and DIST from the aircraft position (or origin on ground) to the ETP.
- The BRG/DIST from the ETP to the defined positions.
- TIME overhead each position, assuming the aircraft flies from the present position to the defined position via the ETP.
- (ETP) pseudo waypoint is displayed on the ND along the F-PLN.
- ETP location in relation to the subsequent waypoint.



Note : 1. In either case, you may only store a company route if the active or secondary flight plan is complete from origin to destination.

2. If you do not enter a name, the FMGS automatically names the stored route automatically as "SRTE 1 (or 2 ...)", when it is stored.

3. The system does not retain several elements of the flight plans, when they are stored :

– Pilot-entered holds
– Offsets
– Pilot-entered constraints
– Modifications to a terminal procedure
– Pseudo waypoints

When this happens, it displays "REVISIONS NOT STORED".

4. If five routes are already stored, the system will reject a new entry and display "PILOTS ROUTES FULL" on the MCDU. Delete a stored route by clearing the CO RTE name before inserting a new one.

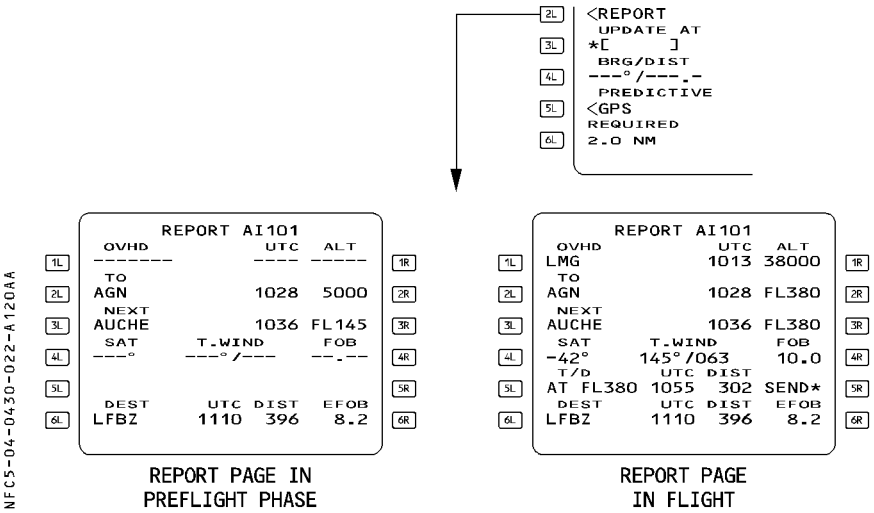
REPORT PAGE

The REPORT page allows the crew to achieve the position reporting.

REPORT PAGE ACCESS

The report page is accessed from the PROG PAGE.

R



REPORT PAGE IN PREFLIGHT PHASE

REPORT PAGE IN FLIGHT

Note : In case a DIR TO with ABEAM WPTs is achieved, the TO WPT (provided on the REPORT page) will be the ABEAM WPT if any, as on the F-PLN page.

ETP ENTRY

- **PRESS the DATA key.**

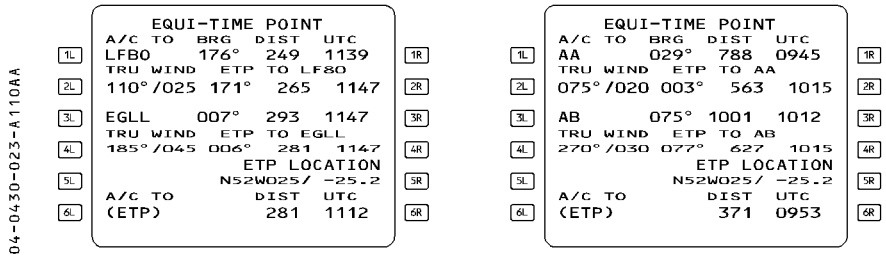
- **SELECT the EQUITIME POINT prompt.**
  The EQUITIME POINT page is displayed. The origin and destination airports are used by default.

- **ENTER the REF POINT 1 in the 1L field.**

- **ENTER the associated wind in the 2L field.**
  The wind to be inserted is the wind in the vicinity of the reference point at the CRZ FL.

- **ENTER the REF POINT 2 in the 3L field.**

- **ENTER the associated wind in the 4L field.**
  The system displays the ETP location with regards to the next waypoint of the active flight plan following the ETP in the 5R field, and the A/C TO (ETP) predictions in the 6R field.



EQUI-TIME PAGE AT ACCESS (DEFAULTED)

NFC5-04-0430-023-A110AA

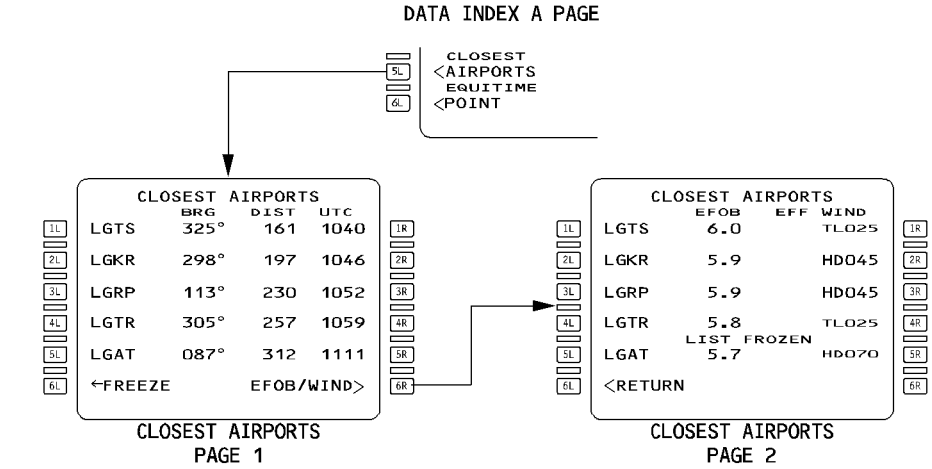
Note : – The ETP pseudo waypoint is not displayed on the MCDU F-PLN page. In order to easily locate it, or when closing the applicable ETP, the TIME MARKER may be used ; this allows the crew to visualize it in advance on the F-PLN page or, to prepare the next applicable ETP on the Equitime Point page.
– The ETP is computed using speed according to the current mode (managed or selected).

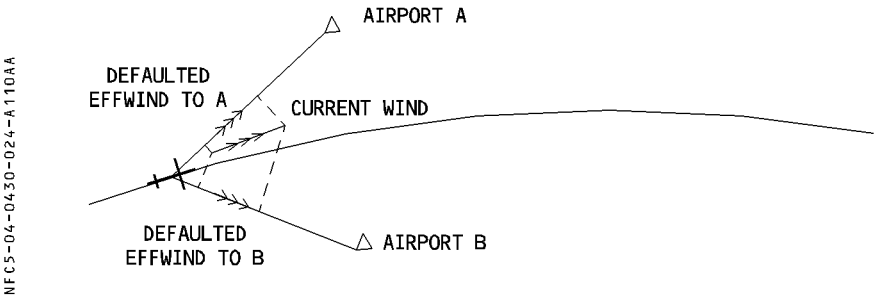
CLOSEST AIRPORTS

The CLOSEST AIRPORTS page displays the four closest airports, from the aircraft's position, found in the navigation database (Refer to 4.03.25 for the page description), and the fifth airport, as selected by the crew.

For each airport, the FM computes :

- The BRG/DIST/ESTIMATED UTC from the aircraft's position to the corresponding airport.
- The EFOB at the airport, assuming an EFFECTIVE WIND (defaulted or entered by the pilot).





Note : When the CLOSEST AIRPORTS page 2 is selected, the list of airports is automatically frozen, as indicated on the page.

EQUI-TIME POINT ENTRY

– **PRESS the DATA key.**

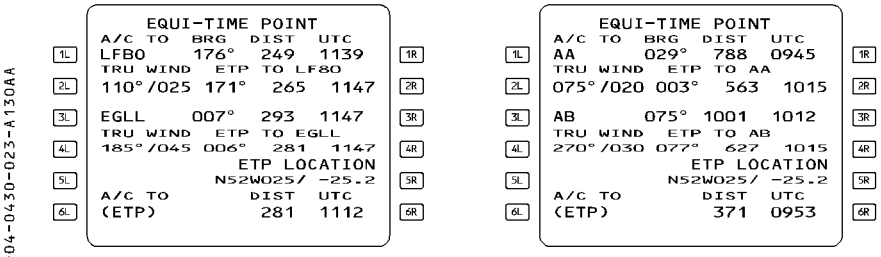
– **SELECT the EQUITIME POINT prompt.**
The EQUITIME POINT page is displayed. The origin and destination airports are used by default.

– **ENTER the REF POINT 1 in the [1L] field.**

– **ENTER the associated wind in the [2L] field.**
The wind to be inserted is the wind in the vicinity of the reference point at the CRZ FL.

– **ENTER the REF POINT 2 in the [3L] field.**

– **ENTER the associated wind in the [4L] field.**
The FMS computes the ETP location (ETP coordinates, and distance between the ETP and the following waypoint on the F-PLN) and displays it in the [5R] field. The FMS also computes predictions related to the ETP (the distance to go, and the predicted time at the ETP) and displays them in the [6R] field.



EQUI-TIME POINT PAGE AT ACCESS (DEFAULTED)

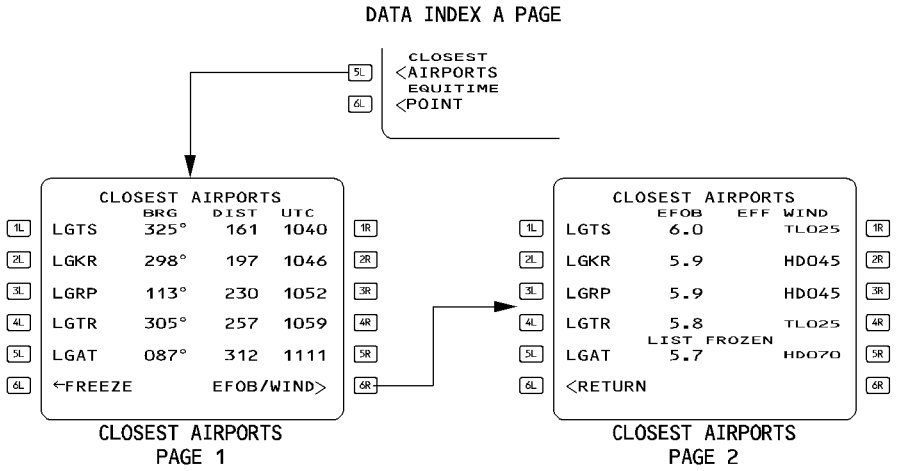
NFC5-04-0430-023-A130AA

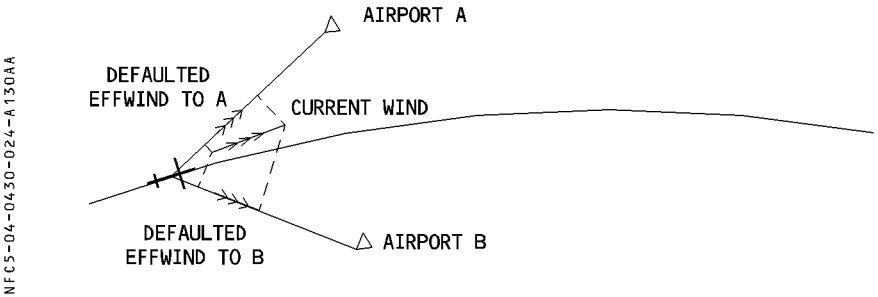
Note : – The ETP pseudo-waypoint is not displayed on the MCDU F-PLN page. In order to easily locate it, or when closing the applicable ETP, the TIME MARKER may be used ; this allows the crew to visualize it in advance on the F-PLN page or, to prepare the next applicable ETP on the Equi-time Point page.
– The ETP is computed using speed according to the current mode (managed or selected).

CLOSEST AIRPORTS

The CLOSEST AIRPORTS page displays the four closest airports, from the position of the aircraft, found in the navigation database (ref. FCOM, 4.03.28 for the page description), and the 5th airport, as selected by the crew.
For each airport, the FM computes :

- The BRG/DIST/ESTIMATED UTC from the position of the aircraft to the corresponding airport.
- The EFOB at the airport, assuming an EFFECTIVE WIND (defaulted or entered by the pilot).





Note : When the CLOSEST AIRPORTS page 2 is selected, the list of airports is automatically frozen, as indicated on the page.

The FUEL/TIME predictions to the closest airports use simplified assumptions :

- Managed speed profile in cruise, with the effective wind from the CLOSEST AIRPORTS page 2. In case of EO, Engine Out condition is considered.
- Continuous descent from CRZ FL down to the airport elevation.

Note : In case SELECTED SPD is used, the CLOSEST AIRPORTS page still provides good use to choose the applicable closest airport for diversion purposes. However, when SELECTED SPD is significantly different from MANAGED SPD, the predictions in terms of time and fuel must be disregarded since they are misleading.
The predictions may then be checked on the SEC F-PLN.

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The FUEL/TIME predictions to the closest airports use simplified assumptions :

- Managed speed profile in cruise, with the effective wind from the CLOSEST AIRPORTS page 2. In case of EO, Engine Out condition is considered.
- Continuous descent from CRZ FL down to the airport elevation.

Note : In case SELECTED SPD is used, the CLOSEST AIRPORTS page still provides good use to choose the applicable closest airport for diversion purposes. However, when SELECTED SPD is significantly different from MANAGED SPD, the predictions in terms of time and fuel must be disregarded since they are misleading.
The predictions may then be checked on the SEC F-PLN.

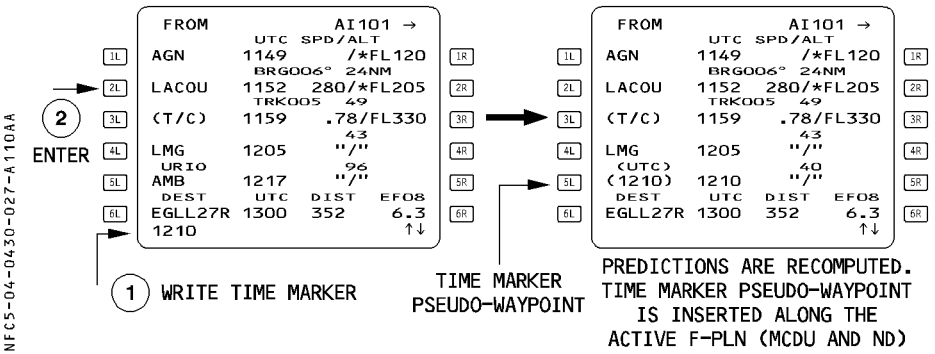
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TIME MARKER

The pilot can enter a time marker in the F-PLN A or B page. Once entered, the FMGS displays a pseudo waypoint along the flight plan on the MCDU and on the Navigation Display. This pseudo waypoint shows the predicted location of the aircraft at the entered time.

HOW TO INSERT A TIME MARKER

- **WRITE the time marker in the scratchpad. The entry format is HHMM.**
- **SELECT any left key of the F-PLN A or B page, to insert the time marker in the active flight plan.**
  The time marker is inserted in the flight plan according to time criteria, irrespective of the key choosen for entry.



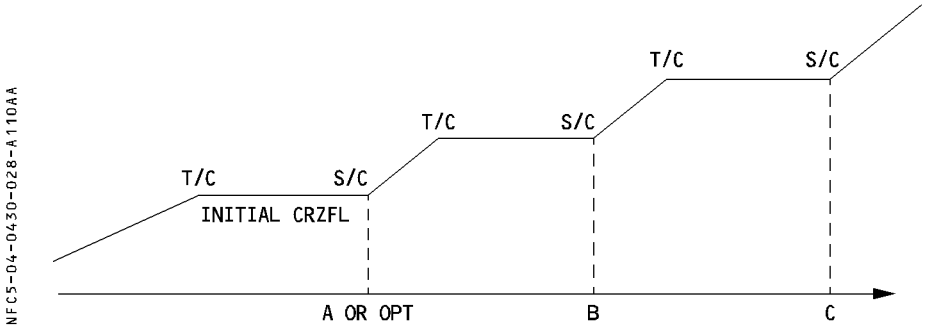
NFCS-04-0430-027-A110AA

Up to four time markers may exist at a time. An attempt to enter a fifth time marker will cause the "TIME MARKER LIST FULL" message to appear on the scratchpad.
The FMGS updates the time marker position with the predictions.
When the current clock time equals or exceeds the time marker entry, the FMGS sequences the time marker (even in preflight).

STEP ALTS

STEP CLIMB/STEP DESCENT

The STEP ALTS function enables the successive CRZ FLs to be defined. The optimum position to initiate a climb, from the initial (or current) CRZ FL to the next one, can also be determined.



PRINCIPLE

Geographic steps

Up to four geographic steps may be defined on the STEP ALTS page. These steps are initiated at the geographical position, along the F-PLN.

Rules

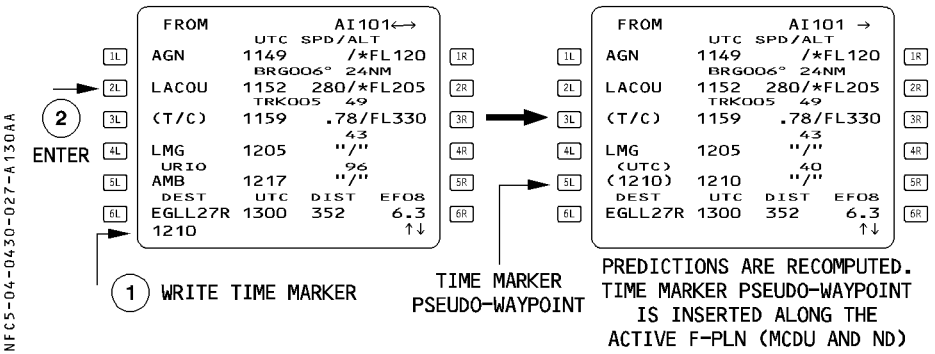
- The minimum step size is 1000 feet.
- A Step Climb (S/C) cannot follow a Step Descent (S/D).
- A STEP is automatically cleared, if :
  - The S/C (S/D) is sequenced without any level change done by the pilot.
  - The pilot achieves a LAT REV, which deletes the associated waypoint from the F-PLN
  - By EO condition.
- A STEP is manually cleared :
  - On the STEP ALTS page, by CLEARING the corresponding field.
  - On the F-PLN page, by CLEARING the (S/C) (S/D) pseudo waypoint.
- A STEP entry is IGNORED, if the remaining CRZ distance is less than about 50 NM.
- Once the steps are inserted in the F-PLN, they are displayed :
  - On the MCDU, as (S/C), (S/D), (T/C), (T/D) pseudo waypoints.
  - On the ND, by associated ↗, ↘, ↗, ↘ white symbols.

TIME MARKER

The crew can enter a time marker in the F-PLN A or B page. Once entered, the FMGS displays a pseudo waypoint along the flight plan on the MCDU and on the Navigation Display. This pseudo waypoint shows the predicted location of the aircraft at the entered time.

HOW TO INSERT A TIME MARKER

- **WRITE the time marker in the scratchpad. The entry format is HHMM.**
- **SELECT any left key of the F-PLN A or B page, to insert the time marker in the active flight plan.**
  The time marker is inserted in the flight plan according to time criteria, irrespective of the key choosen for entry.



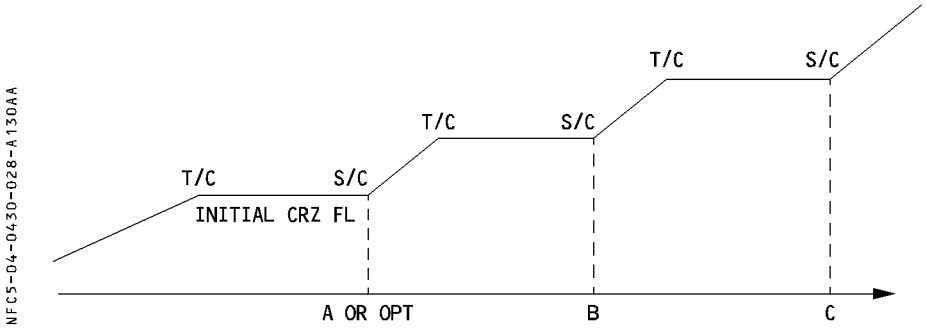
NFCS-04-0430-027-A130AA

Up to four time markers may exist in the F-PLN at a time. An attempt to enter a fifth time marker will cause the "TIME MARKER LIST FULL" message to appear on the scratchpad.
The FMGS updates the time marker position with the predictions.
When the current clock time equals or exceeds the time marker entry, the FMGS sequences the time marker (even in preflight).

STEP ALTS

STEP CLIMB/STEP DESCENT

The STEP ALTS function enables to define the successive cruise Flight Levels. The optimum position to initiate a climb, from the initial (or current) cruise Flight Level to the next one, can also be determined.



PRINCIPLE

Geographic steps

Up to four geographic steps may be defined on the STEP ALTS page. These steps are initiated at the geographical position, along the F-PLN.

Rules

- The minimum step size is 500 feet.
- A STEP is automatically cleared, if :
  - The S/C (S/D) is sequenced without any level change done by the crew.
  - The crew achieves a LAT REV, which deletes the associated waypoint from the F-PLN
  - By EO condition.
- A STEP is manually cleared :
  - On the STEP ALTS page, by CLEARING the corresponding field.
  - On the F-PLN page, by CLEARING the (S/C) or (S/D) pseudo-waypoints.
- A STEP entry is IGNORED, if the remaining CRZ distance is less than about 50 NM.
- Once the steps are inserted in the F-PLN, they are displayed :
  - On the MCDU, as (S/C), (S/D), (T/C), (T/D) pseudo waypoints.
  - On the ND, by associated ↗, ↘, ↗, ↘ white symbols.

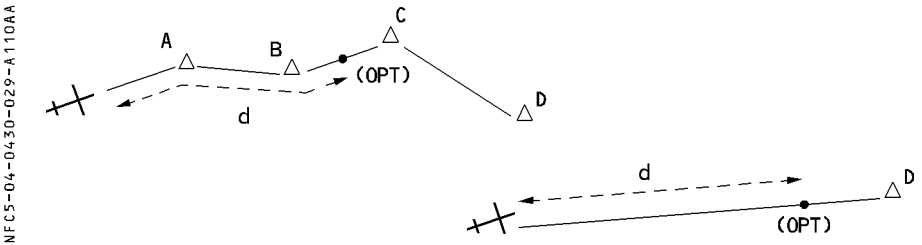
Optimum step

Once geographic steps are inserted or an altitude is entered, the FM proposes an OPTIMUM STEP start of climb position for the first step climb altitude ahead : Fuel/time savings are displayed, if above 100 kg/1 min. If no savings are found, no optimum step is proposed.

The OPT STEP is not automatically inserted, the pilot has to insert it, if appropriate. Once inserted, the OPT STEP point (OPT), is then a fixed geographical point.

If some F-PLN parameters are subsequently changed (winds, new waypoints, ...), an update of the optimum position relative to the previous one may be proposed. If savings exist, this new optimum may be inserted to replace the previous optimum step point.

Once an OPT STEP is inserted in the F-PLN, and the pilot achieves a lateral F-PLN revision, the FM keeps the (OPT) along the new F-PLN, at the same distance from the aircraft's position, as previously determined.



Rules

- The OPT STEP is only computed by the FM, if data required for the prediction computation are inserted : F-PLN, CRZ FL, CI, GW, CG at least.
- The search of the OPT STEP begins 20 NM beyond T/C before Cruise, or ahead of the aircraft's position.
- The search of the OPT STEP ends 20 NM before the next STEP POINT, or 300 NM before the TOD.
- Only one OPT STEP is computed at a time.

Guidance

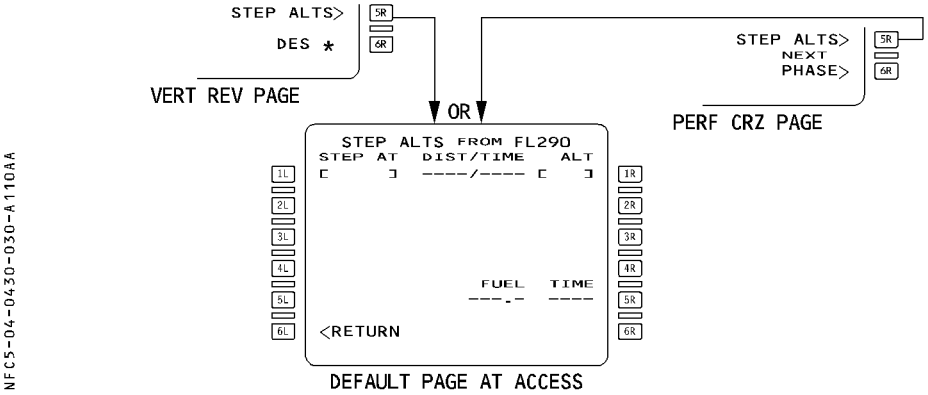
When reaching the step point, the steps must be initiated by the pilot by selecting the new CRZ FL, and pushing the FCU ALT selector knob. If sequenced without any pilot action, the step is automatically deleted.

If the pilot initiates the step :

- The CRZ FL is automatically reassigned to its new value.
- The guidance is THR CLB/CLB for a step climb.
  THR IDLE/DES with V/S = – 1000 ft/mn for a step descent.

STEP entry

The STEP ALTS page is either accessed from the : — The VERT REV page, or
— PERF CRZ page.



For GEOGRAPHIC STEP :

— PRESS the F-PLN or PERF key.

— SELECT vertical revision at a cruise waypoint.

— SELECT the STEP ALTS prompt.

— WRITE the POSITION/NEW CRZ FL in the scratchpad, and ENTER it in 1L to 4L.

Note : — The position may be a waypoint ident, PBD, PD.
— The pilot may enter LMG/–20/350. The FM will compute the geographic step 20 NM before LMG to FL 350.
— To modify an inserted STEP :
· To modify the CRZ FL only, enter it in the right key.
· To modify the position only, enter it in the left key.
R *· To modify both, modify the position first, and then the CRZ FL (it is not*
R *possible to modify both in a single entry).*

— CHECK the PREDICTIONS.

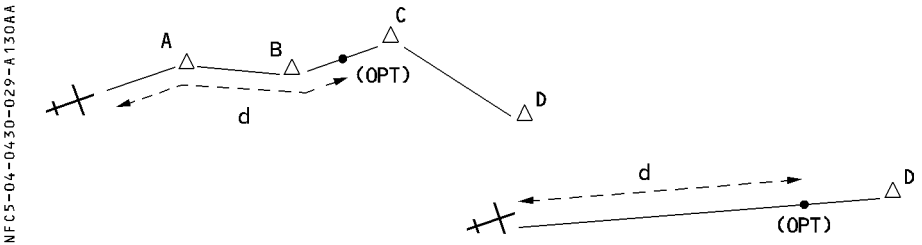
Optimum step

Once geographic steps are inserted or an altitude is entered, the FM proposes an OPTIMUM STEP start of climb position for the first step climb altitude ahead : Fuel/time savings are displayed, if above 100 kg/min. If no savings are found, no optimum step is proposed.

The OPT STEP is not automatically inserted. The crew must insert it, if appropriate. Once inserted, the OPT STEP point (OPT) becomes a fixed geographical point.

If some F-PLN parameters are subsequently changed (e.g. winds, new waypoints), an update of the optimum position relative to the previous one may be proposed. If savings exist, this new optimum may be inserted to replace the previous optimum step point.

Once an OPT STEP is inserted in the F-PLN, and the crew achieves a lateral F-PLN revision, the FM keeps the (OPT) along the new F-PLN, at the same distance from the aircraft's position, as previously determined.



NFC5-04-0430-029-A130AA

Rules

- The OPT STEP is only computed by the FM, if data required for the prediction computation are inserted : F-PLN, CRZ FL, CI, GW, CG at least.
- The search of the OPT STEP begins 20 NM beyond (T/C) before Cruise, or ahead of the aircraft's position.
- The search of the OPT STEP ends 20 NM before the next STEP POINT, or 300 NM before the (T/D).
- Only one OPT STEP is computed at a time.

Guidance

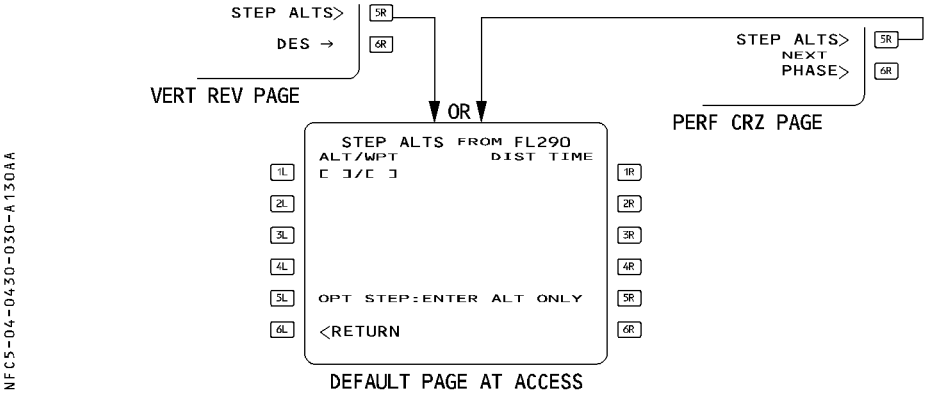
When reaching the step point, the steps must be initiated by the crew by selecting the new CRZ FL, and pressing the FCU ALT selector knob. If sequenced without any crew action, the step is automatically deleted.

If the crew initiates the step :

- The CRZ FL is automatically reassigned to its new value.
- The guidance is THR CLB/CLB for a step climb.
  THR IDLE/DES with V/S = – 1000 ft/mn for a step descent.

STEP entry

The STEP ALTS page is either accessed from the : — The VERT REV page, or
— PERF CRZ page.



For GEOGRAPHIC STEP :

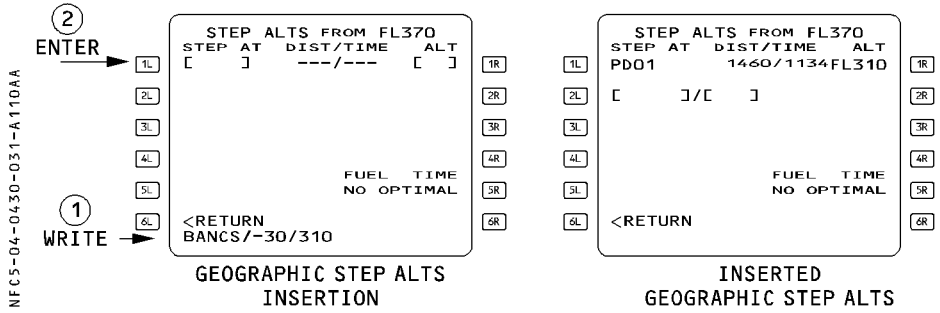
— PRESS the PERF key, or PRESS the F-PLN key and SELECT VERT REV at a cruise waypoint.

— SELECT the STEP ALTS prompt.

— WRITE the ALT/WPT in the scratchpad, and ENTER it in 1L to 4L.

Note : — The position may be a waypoint ident, PBD, PD.
— The crew may enter LMG/–20/350. The FMS will compute a geographic step to FL350 20 NM before LMG.
— To modify an inserted STEP :
· To modify the CRZ FL only, enter it in the left key, as "FLXXX".
· To modify the position only, enter it in the left key, as "/XXX".
· To modify both, modify the position first, and then the CRZ FL (it is not possible to modify both in a single entry).

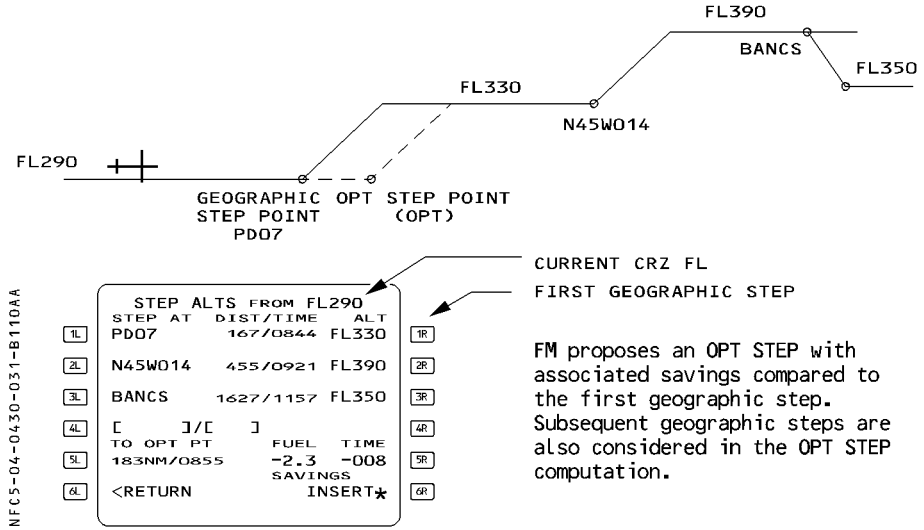
— CHECK the PREDICTIONS.



NFCS-04-0430-031-A110AA

For OPTIMAL STEP

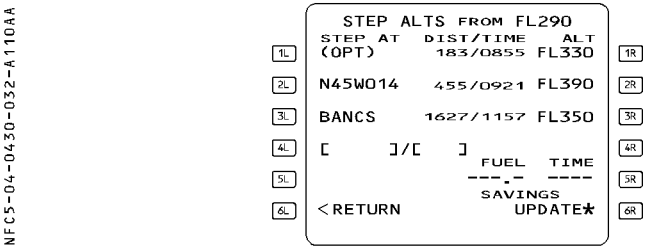
Once all geographical steps are inserted, and the predictions are available, the STEP ALTS page displays the FUEL/TIME savings for the first step climb. If no significant savings are predicted, the NO OPTIMAL message is displayed.



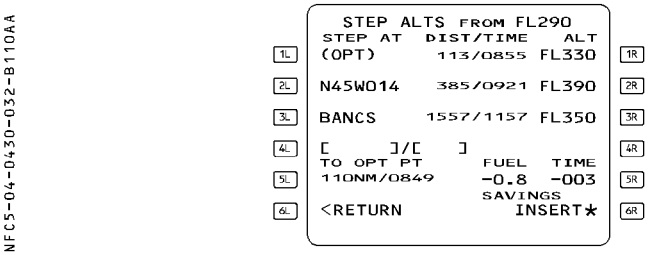
NFCS-04-0430-031-B110AA

To INSERT the proposed OPT STEP :

– **SELECT the INSERT prompt.**



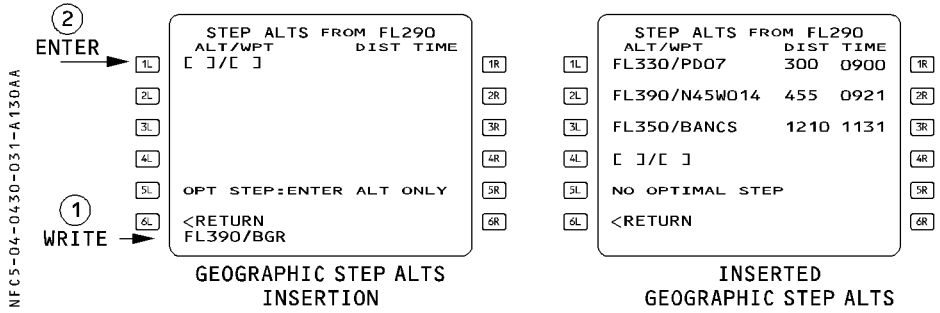
The computed (OPT) step replaces the initially inserted step position, and is then considered at a fixed geographic position. Savings are no longer displayed, and the UPDATE prompt replaces the INSERT prompt. This prompt allows the crew to update the (OPT) step position, considering possible F-PLN or inserted wind changes.
If pressed, a new OPT point is proposed, with the associated SAVINGS and INSERT prompt, or NO OPTIMAL.
UPDATE prompt has been pressed, the new OPT STEP point gives additional savings :



There are only 2 CRZ FLs in the F-PLN :

The pilot may obtain the OPT position of the STEP point, as follows :

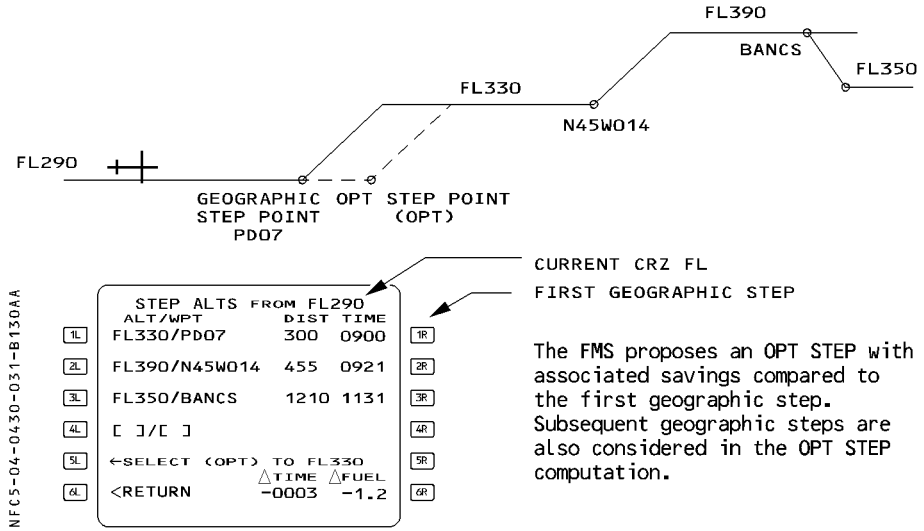
- **INSERT the initial cruise FL on the INIT A page.**
- **ENSURE that the ZFW and BLOCK fuel are inserted on the INIT B page.**
- **WRITE the new cruise FL in the STEP ALTS page, and INSERT it in the 1R field.** Distance and time to optimum point and fuel/time saving are displayed.



For OPTIMAL STEP

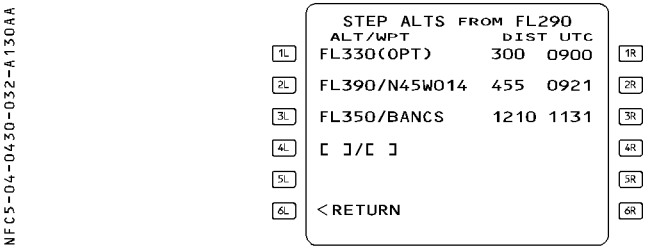
Once the geographic steps are inserted, and the predictions are available, the FMGS computes an optimal location for the first step, and the STEP ALTS page displays the associated FUEL/TIME savings.

Note : If the FMGS cannot determine an optimal step for the selected altitude, "NO OPTIMAL STEP" is displayed in the [5L] field.



To INSERT the proposed OPT STEP :

– **SELECT the [5L] prompt.**



The computed (OPT) step replaces the initially inserted step position. Once inserted, the time and fuel savings associated to the optimal step are no longer displayed. The optimum step position is regularly updated until the aircraft is within 20 NM of the optimum step point.

Note : If the circumstances lead to a situation where the entered optimal step is no longer optimal, "NO OPTIMAL" is displayed in the 1R field.

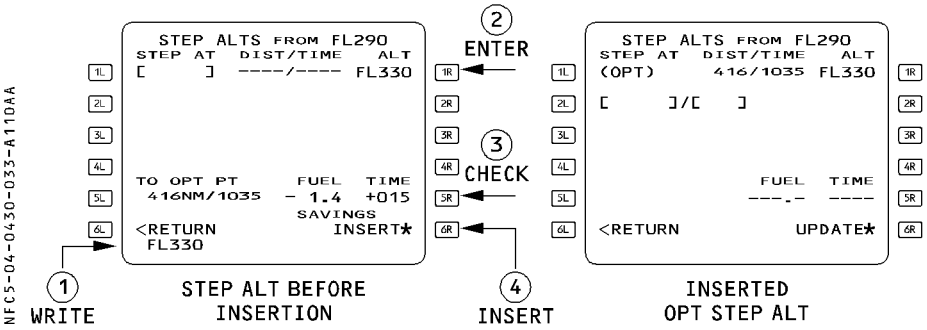
To determine the optimal step location when there are only 2 CRZ FLs in the F-PLN :

The crew may obtain the optimal position for the STEP as follows :

- **INSERT the initial CRZ FL on the INIT A page.**
- **ENSURE that the ZFW, ZFWCG and BLOCK fuel are inserted on the INIT B page.**
- **ENTER the new CRZ FL in the STEP ALTS page in the [1L] field.**
  If an optimal step can be determined, the FMGS automatically computes the optimal position of the step, with associated fuel/time savings.

– **CHECK the fuel and time savings and prediction on the 5L and 5R fields.**
Savings are computed by comparing the entered step altitude, and the origin altitude of the step.

– **INSERT, if suitable.**



Note : No OPT STEP is available in the SEC F-PLN.

Messages

Messages may be displayed in the DIST/TIME field :
– "ABOVE MAX", if the inserted step altitude exceeds the MAX MAX ALT.
The "STEP ABOVE MAX FL" scratchpad message is associated to the "ABOVE MAX" message.
– "IGNORED"
This message is displayed in the following cases :
· Step climb is located prior to the top of climb, or after the top of descent.
· Step end is at less than 50 NM from the top of descent. An optimum step point, < 200 NM from top of descent, cannot be inserted.
– "STEP NOW", if the step climb is at less than 20 NM.
The following message may be displayed in the scratchpad :
– "NOT ALLOWED", if :
· Four steps already exist in the F-PLN, and an additionnal entry is attempted.
· Any attempt to enter a step at the FROM waypoint, or at a pseudo waypoint is done.
· Two consecutive steps are entered at the same waypoint (e.g. step climb after step descent).

REQUIRED TIME OF ARRIVAL (RTA)

A time constraint (RTA) may be assigned at any waypoint of the F-PLN, downpath of the origin and the FROM waypoint. It can be an "AT", "AT OR BEFORE", or "AT OR AFTER" constraint.

The FM computes a new managed speed profile from the aircraft position to the constrained waypoint, in order to match the 30–second difference (△T) between the time predicted at the constrained waypoint and the RTA. This modified managed speed profile can be checked using the speed prediction, displayed for each waypoint of the F-PLN page.

R The RTA function uses a speed range between Green Dot speed and VMO - 10 (or MMO
R - 0.02).

When the constrained waypoint is sequenced, the ECON SPD/MACH is resumed unless the constrained waypoint is located in a descent segment.

Note : The FM does not compute a new managed speed profile when a RTA is entered in the descent profile while the aircraft is in cruise within 40 NM from the top of descent.

The time constraint is inserted on the RTA page. A time constraint may be inserted at any waypoint of the primary or secondary flight plan.

If an engine-out condition is detected, the time constraint is automatically deleted and RTA DELETED message on scratchpad.

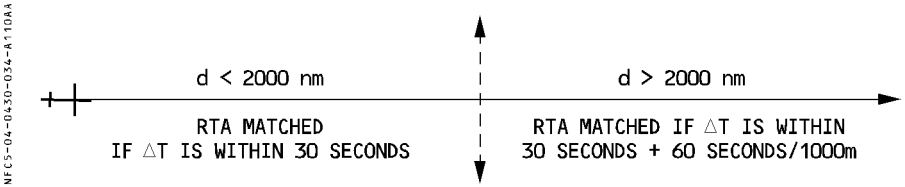
If the aircraft enters a holding pattern, the downpath time constraint is deleted.

Once inserted in the F-PLN, the RTA is displayed in magenta on the F-PLN page, as long as no predictions are available.

Once the predictions are available, the time constraint is replaced by the new predicted time at the associated waypoint,and highlighted by a star : (*)

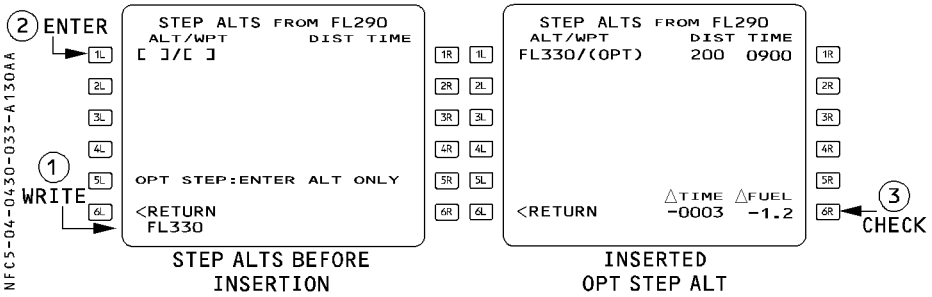
– The (*) is magenta, if the time constraint is matched with the 30–second criteria.
– The (*) is amber, if the time constraint is missed.

Time constraint matching criteria :



Note : △T is the time difference between the time predicted at the constrained waypoint and the RTA.

– **CHECK the fuel and time savings and prediction on the 6R field.**
Savings are computed by comparing the entered step altitude, and the origin altitude of the step.



Note : No OPT STEP can be computed in the SEC F-PLN.

Messages

Messages may be displayed in the DIST/TIME field :
– "ABOVE MAX", if the inserted step altitude exceeds the REC MAX ALT.
The "STEP ABOVE MAX FL" scratchpad message is associated to the "ABOVE MAX" message.
– "IGNORED" displayed in the following cases :
· Step climb is located prior to the top of climb, or after the top of descent.
· Step end is at less than 50 NM from the top of descent. An optimum step point, < 200 NM from top of descent, cannot be inserted.
– "STEP AHEAD", when the distance to the step point is less than 20 NM. A "STEP AHEAD" scratchpad message is also displayed.
– A "NOT ALLOWED" message is displayed in the scratchpad, if :
· Four steps already exist in the F-PLN, and an additional step is entered.
· A step is entered at the FROM waypoint, or at a pseudo-waypoint.
· Two consecutive steps are entered at the same waypoint (e.g. step climb after step descent).

REQUIRED TIME OF ARRIVAL (RTA)

A time constraint (RTA) may be assigned at any waypoint of the F-PLN, downpath of the origin and the FROM waypoint. It can be an "AT", "AT OR BEFORE", or "AT OR AFTER" constraint.

The FMS computes a new managed speed profile from the aircraft position to the constrained waypoint, in order to match the 30–second difference (△T) between the time predicted at the constrained waypoint and the RTA. This modified managed speed profile can be checked using the speed prediction, displayed for each waypoint of the F-PLN page.

The RTA function uses a speed range between Green Dot speed and VMO – 10 (or MMO – 0.02).

When the constrained waypoint is sequenced, the ECON SPD/MACH is resumed unless the constrained waypoint is located in a descent segment.

The time constraint is inserted on the RTA page. A time constraint may be inserted at any waypoint of the active or secondary flight plan.

If an engine-out condition is detected, the time constraint is automatically deleted and RTA DELETED message on scratchpad.

If the aircraft enters a holding pattern, the downpath time constraint is deleted.

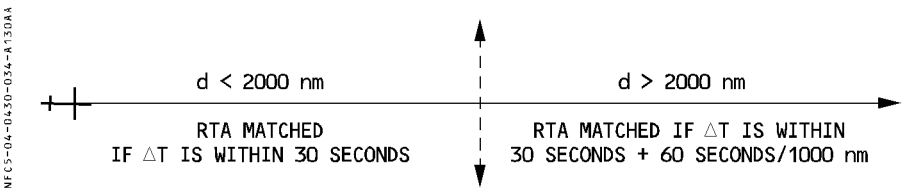
Once inserted in the F-PLN, the RTA is displayed in magenta on the F-PLN page, as long as no predictions are available. On the PERF page, the Cost Index value is replaced by "RTA CI".

Once the predictions are available, the time constraint is replaced by the new predicted time at the associated waypoint, and highlighted by a star : (*)

– The (*) is magenta, if the time constraint is matched with the 30–second criteria.

– The (*) is amber, if the time constraint is missed.

Time constraint matching criteria :

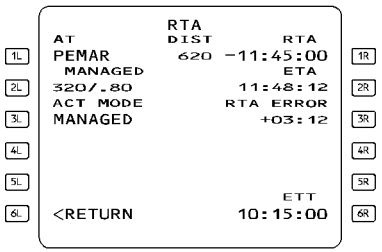


Note : △T is the time difference between the time predicted at the constrained waypoint and the RTA. It is used to define the "missed" or "made" status.

TIME CSTR entry

- **PRESS the F-PLN key.**
- **SELECT vertical revision at the revised waypoint.**
- **SELECT the RTA key.**
- **ENTER a waypoint at which a time constraint is to be defined.**
- **WRITE the time constraint (+/–HHMMSS) into the scratchpad and ENTER**
  The display automatically reverts to the F-PLN A page.

NFCS-04-0430-035-A110AA



Note : – The TIME CSTR can be directly cleared on the F-PLN A page, using the CLR key.

– The time constraint is automatically deleted in the following cases :

- *Engine out, or*
- *When entering a holding pattern, or*
- *In case of Go-Around, or*
- *A time constraint is entered at another waypoint, while another time constraint already exists.*

A scratchpad "RTA DELETED" message is displayed.

ESTIMATED TAKEOFF TIME (ETT)

The Estimated Takeoff Time (ETT) may be entered by the pilot during the preflight phase at the origin airport. This time is used as the initialization time for predictions.
The entry is accepted in the preflight phase, if the ETT is greater than the clock time.

PROCEDURE

- **PRESS the F-PLN key.**

- **SELECT a vertical revision at origin.**

- **SELECT the RTA page.**

- **WRITE the ETT into the scratchpad, and ENTER in the ETT field.**
  The display automatically reverts to the F-PLN A page.

  Note :
  - *If the current time exceeds the ETT entry, the CLK IS TAKE OFF TIME message is displayed ; the ETT is replaced by the clock time.*
  - *When the takeoff occurs, the takeoff time is automatically updated at the clock time.*
  - *ETT entry is automatically deleted, if the origin airport is modified, or if the clock is inoperative.*
  - *If a time constraint is entered at a waypoint in the F-PLN, the takeoff time required to match the constraint is automatically computed by the FM. This result is displayed in magenta as ETT at the origin.*

USE OF TIME/ETT CONSTRAINT

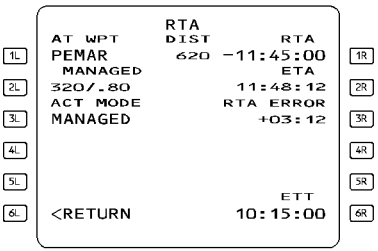
During preflight :
- If an ETT has been entered, time predictions are based on the entered value (or clock time, if greater).
- If both an ETT and a time constraint have been entered, time predictions are based on the entered ETT value (or clock time, if greater). The managed speed profile is computed to match the time constraint, as closely as possible, using a pseudo cost index value. (Not displayed).
- If only a time constraint has been entered :
  - Optimum speeds are computed to determine the ETT, so as to satisfy the time constraint.
  - If necessary, flight time (based on optimum speeds) plus clock time (current) is greater than the time constraint ; optimum speeds are modified to match the time constraint as closely as possible.

After Takeoff : The predictions are based on the current time.
Speeds are adjusted to satisfy the time constraint.

Entry of a Required Time of Arrival

- **PRESS the F-PLN key.**
- **SELECT VERT REV at any waypoint.**
- **SELECT the RTA prompt [2R].**
- **ENTER the waypoint at which a time constraint is to be defined in the [1L] field.**
  When accessing the RTA page, the [1L] field is defaulted to the waypoint at which the vertical revision has been performed.
- **WRITE the RTA in the scratchpad and ENTER in the [1R] field.**
  The format to be used is :
  · "HHMMSS" for "AT HHMMSS" (ex : "124500")
  · "+HHMMSS" for "AT OR AFTER HHMMSS" (ex : "+124500")
  · "-HHMMSS" for "AT OR BEFORE HHMMSS" (ex : "-124500")

NFCS-04-0430-035-A130AA



Note : — The RTA can be directly cleared on the F-PLN A page, using the CLR key.
— The time constraint is automatically deleted in the following cases :
· Engine out, or
· When entering a holding pattern, or
· In case of Go-Around, or
· A time constraint is entered at another waypoint, while another time constraint already exists.
In case a time constraint is deleted, the "RTA DELETED" scratchpad message is displayed.

ESTIMATED TAKEOFF TIME (ETT)

The Estimated Takeoff Time (ETT) may be entered by the pilot during the preflight phase at the origin airport. This time is used as the initialization time for predictions.
The entry is accepted in the preflight phase, if the ETT is greater than the clock time.

PROCEDURE

– PRESS the F-PLN key.

– SELECT VERT REV at any waypoint.

– SELECT the RTA prompt [2R].

– ENTER the ETT in the [6R] field.

Note : – *If the current time exceeds the ETT entry, the CLK IS TAKE OFF TIME message is displayed ; the ETT is replaced by the clock time.*
– *At takeoff, the takeoff time is automatically updated using the actual clock time.*
– *An ETT entry is automatically deleted, if the origin airport is modified, or if the clock is inoperative.*
– *If a time constraint is entered at a waypoint in the F-PLN, the takeoff time required to match the constraint is automatically computed by the FM. This result is displayed in magenta as ETT at the origin.*

USE OF TIME/ETT CONSTRAINT

During preflight : – If an ETT has been entered, time predictions are based on the entered value (or clock time, if greater).
– If both an ETT and a time constraint have been entered, time predictions are based on the entered ETT value (or clock time, if greater). The managed speed profile is computed to match the time constraint, as closely as possible, using a pseudo cost index value. (Not displayed).
– If only a time constraint has been entered :
· Optimum speeds are computed to determine the ETT, so as to satisfy the time constraint.
· If necessary, flight time (based on optimum speeds) plus clock time (current) is greater than the time constraint ; optimum speeds are modified to match the time constraint as closely as possible.

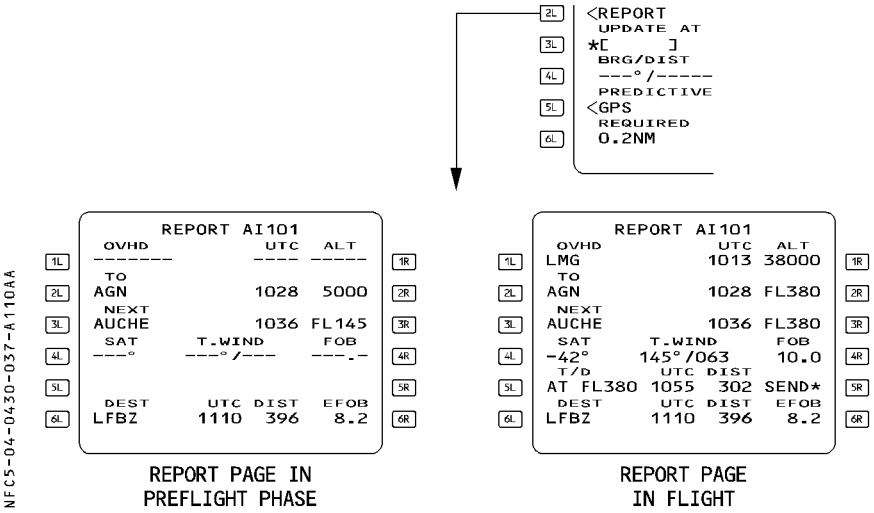
After Takeoff : The predictions are based on the current time.
Speeds are adjusted to satisfy the time constraint.

REPORT PAGE

The REPORT page allows the crew to achieve the position reporting.

REPORT PAGE ACCESS

The report page is accessed from the PROG PAGE.



NFCS-04-0430-037-A110AA

REPORT PAGE IN PREFLIGHT PHASE

REPORT PAGE IN FLIGHT

Note : In case a DIR TO with ABEAM WPTs is achieved, or in case a FIX INFO with ABEAM or RADIAL intersection is inserted in the F-PLN, the TO WPT (provided on the REPORT page) will be the ABEAM WPT or the RADIAL intersect waypoint, if any, as on the F-PLN page.

EQUI-TIME POINT

The EQUI-TIME POINT page displays the ETP, computed along the F-PLN route between two referenced positions (airports, waypoints or navaids), defined by the crew (ref. FCOM 4.03.28 for the page description).

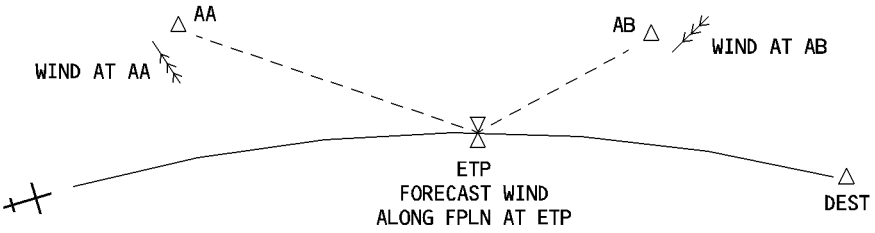
When first accessing the page, the FMS proposes origin and destination airfields, as defaulted positions.

The crew may overwrite these two positions and insert the wind in their vicinity at the applicable CRZ FL.

The FMS then computes the resulting ETP, using the managed or selected speed, and blending the forecasted winds along the F-PLN route with the inserted winds.

The FMS provides :

- TIME and DIST from the aircraft position (or origin on ground) to the ETP
- The BRG/DIST from the ETP to the defined positions
- TIME overhead each position, assuming the aircraft flies from the present position to the defined position via the ETP
- (ETP) pseudo waypoint is displayed on the ND along the F-PLN
- ETP location in relation to the subsequent waypoint.



NFC5-04-0430-037-A130AA

POLAR NAVIGATION

When a flight is scheduled to cross high latitude areas (usually beyond 60° N or S,) various precautions must be taken regarding ADIRSs, FMGSs, and EIS.
These precautions are mostly dictated by :

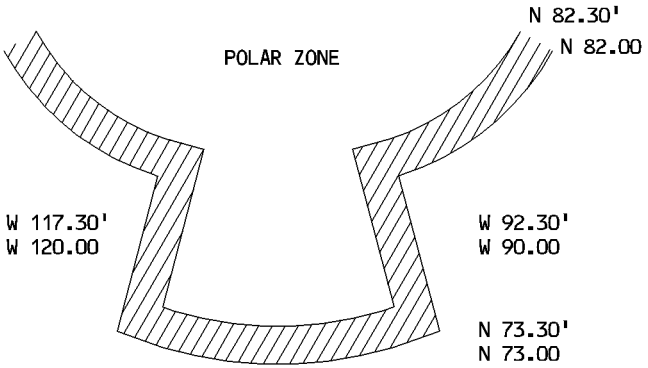
- The change from the MAG to TRUE heading (track) reference required by the airway reference changes at high latitudes, or the unavailability of magnetic variation at high latitudes.
- Some particularities linked to the pole overfly.

DESCRIPTION

ADIRS

- **Alignment :**
  The IRS may be aligned up to latitude 73N without any particular procedures.
  Between 73N and 82N (north or south), the required alignment time is greater and a specific procedure has to be performed.
  Beyond 82° North or South, no ADIRS alignment is possible.

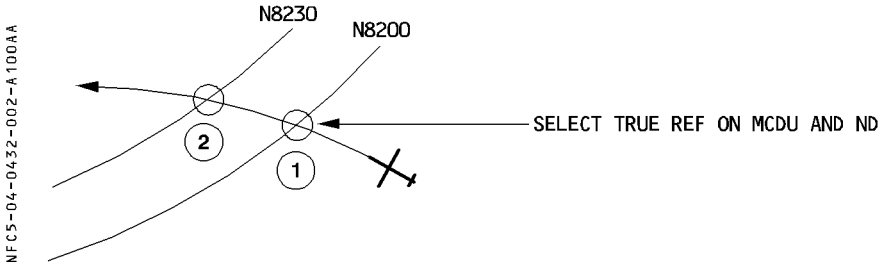
- **MAG-TRUE reference selection :**
  The ADIRS are able to provide TRUE heading (track), regardless of the aircraft latitude.
  The ADIRS are able to provide MAG heading (track) between latitudes 82°30 N and 60°30 S, except in the vicinity of the magnetic pole, as shown below :



NFC5-04-0432-001-A100AA

Note : 1. The latitude values given in this diagram are average values. In reality, the polar area involves different hysteresis, combined with the track angle penetration of the aircraft in the zone.
2. All airfields where STARs and approaches are MAG referenced — such as Svalbard — will be flown with magnetic reference selected.
3. Although located outside the polar zone, Thule is "TRUE" oriented.

The MAG/TRUE selection is achieved manually by pressing the NORTH REF pushbutton, or automatically if the aircraft enters the polar zone with MAG still selected. In this case the following messages and cautions are displayed.



When in 1, the "SELECT TRUE REF" amber message is displayed on the ND and MCDU scratchpad.
When in 2, and MAG reference is still selected, following events will occur :

- The IRSs automatically revert from MAG to TRUE
- A TRUE indication appears on the ND and PFD heading scales. The GRID track information appears on ND.
- The autopilot might disconnect, an amber caution NAV HDG DISCREPANCY (associated with a CHECK HDG message on the PFD and on the ND) might be triggered (the IRS do not reach the polar zone simultaneously).

Note : The messages and cautions are triggered as soon as the first IRS reaches the polar zone ; when the other two IRSs enter the polar zone, the messages are no longer displayed.

FMGS

- Flight Guidance part
  - When the pilot manually changes the heading reference from MAG to TRUE or vice versa.
    - if NAV mode is engaged, there is no discontinuity in the lateral guidance
    - if HDG (TRK) modes are engaged, the HDG (TRK) target is automatically modified using current position variation ; thus there is no discontinuity in the lateral guidance
  - When TRUE reference is selected, only CAT I ILS approaches may be flown
  - if an automatic MAG/TRUE switching occurs when entering the Polar zone, the autopilot might disengage due to the fact that most probably, the automatic switching will not occur simultaneously for the 3 IRSs. The AP OFF warning is displayed on the ECAM.

– Flight Management part
  · When the aircraft reaches 78 N (60 S), the aircraft position is computed using XYZ earth centered Cartesian coordinates.
  This allows the FM to continuously provide, a MIX IRS position regardless of latitude, the FM position being linked to the MIX IRS position.
  · During preflight phase, if TRUE reference is selected (takeoff with TRUE reference is rare), the pilot is reminded of this selection by :
    * CHECK NORTH REF amber message on ND and MCDU scratchpad if the origin airport reference does not match the one selected by the pilot.
    * TRUE label above PFD/ND heading scales flashes for 10 seconds at slats extension.
    * TRUE NORTH REF memo message flashes for 10 seconds at engine start or at slat extension.
  · Before approach, the pilot is reminded of the correct TRUE/MAG selection by :
    * CHECK NORTH REF amber message on ND and MCDU scratchpad if the destination airport reference in database does not match the one selected by the pilot and the aircraft reaches the arrival area (approximately 25 NM from destination airport).
    * If true is selected, TRUE label pulses on PFD/ND during 10 seconds at slats extension, as well as the TRUE NORTH REF message on ECAM (as a reminder).
  · The tracks and bearings, provided on the MCDU F-PLN, PROG... pages are computed TRUE or MAG referenced, according to the TRUE/MAG cockpit selection
    * if selection is TRUE, the bearing and track figures are displayed followed by a T.
  · if the pilot wishes to create a PBD, PB/PB waypoint or define a radial (DIR TO INTCPT), the rule for bearing or radial entry is as follows :
    * if the bearing is inserted without specifying its reference, the reference is the one corresponding to the cockpit selection
    * if the bearing is inserted with its specified reference (M for magnetic, T for true), the bearing is so defined : e.g. TOU/350 T/15.

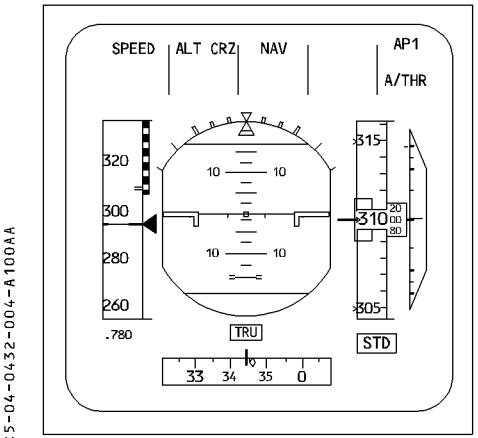
EIS PFD/ND

– **TRUE/MAG reference indication**

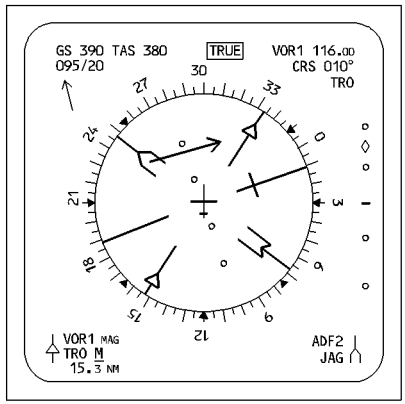
The TRUE/MAG reference selection is indicated by a specific label displayed above the heading scales of both EFIS DUs :

· If MAG is selected (which is the most common situation) no label is provided ; the bearing to the TO waypoint on the ND is displayed with the digits only

· If TRUE is selected (manually or automatically), a TRUE label is provided above PFD/ND heading scales.



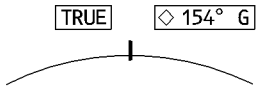
PFD : TRUE REFERENCE SELECTED



ND ROSE in ROSE-VOR mode:
TRUE REFERENCE SELECTED

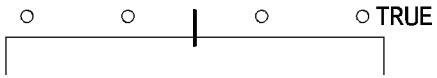
NFCS-04-0432-004-A100AA

· The GRID TRACK appears on the ND in all modes except in PLAN mode if no approach title is displayed.



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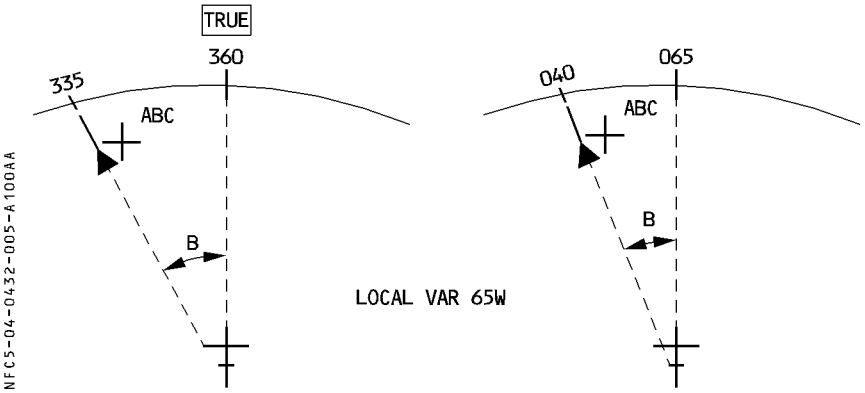
Note : If the ILS scale is displayed on PFD, the TRUE message is shifted on the right side.



NFCS-04-0432-004-C100AA

ADF and VOR bearing display

– The ADF needle represents the relative bearing between the aircraft and the NDB.
The ADF relative bearing information (B) is thus independant of the TRUE/MAG selection, and the needle is always pointing to the same direction whatever is the selection.
Furthermore (provided FM position is accurate) when the EFIS ND is in ARC or ROSE NAV modes, the ADF needle will point towards the NDB symbol as provided by the FMS.

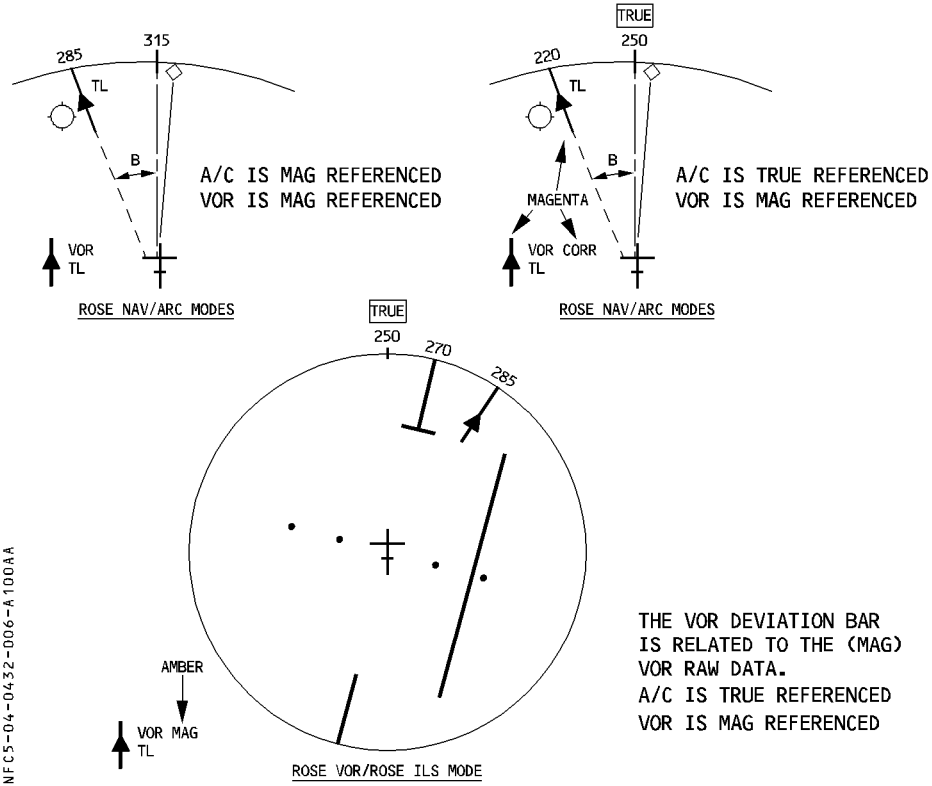


Note : the same reading is available on the DDRMI.

– The VOR bearing is measured by the VOR, at the VOR location :
· it is a TRUE bearing if the VOR station is TRUE referenced
· it is a MAG bearing if the VOR station is MAG referenced.
When the ND display mode is ARC or ROSENAV, the FM computed data (aircraft position, F-PLN legs, NAVAID position symbol...) are provided along with VOR needles, if selected.
→ It is important in these display modes, that there is a consistency between the FM data and the VOR raw data.
Hence, if the cockpit NORTH REF selection does not match the VOR station reference, there may be a discrepancy between the VOR raw data and the FM data, unless a correction is applied to the VOR data.

Principle
When the ND is in ARC/ROSE NAV mode, if there is a mismatch between the NORTH REF selection and the VOR station reference, the VOR needle is equal to the VOR raw bearing corrected by the local variation at the aircraft present position.
In that case, the needle is displayed in magenta colour, the label CORR (corrected) is displayed in magenta in the lower corner of the ND.
In all other ND display modes (ROSE VOR, ROSE ILS), the VOR raw data (with no correction) is displayed. MAG or TRUE (amber) is displayed next to the VOR identifier when its reference does not match the cockpit selection.

Example :
Local variation 65W – TL is a magnetic referenced VOR.



VOR transmitter Reference	ND display MODE	Cockpit Reference Selection		DDRMI
		TRUE	MAG	
TRUE	ARC/ROSE NAV	VOR Raw data	VOR is corrected	VOR RAW DATA
	ROSE VOR/ILS	VOR RAW DATA		
MAG	ARC/ROSE NAV	VOR is corrected	VOR Raw data	
	ROSE VOR/ILS	VOR RAW DATA		

Note : ND in ROSE VOR/ROSE ILS modes and DDRMI VOR bearing indications are always identical.

DDRMI

The heading provided by the DDRMI is directly linked to the NORTH REF cockpit selection. The VOR bearing indications are raw data, as provided by the station.

PROCEDURES

IRS alignment :

- **When a high latitude flight or polar flight is planned, it is most probably a long range type of a flight.**
  - **DELAY the completion of IRS aligment as long as possible.**
  - **Prior to pressing the ALIGN IRS prompt, SLEW the origin airport reference coordinates to the gate coordinates, if published.**
- **When the origin airport is located between latitude 73°N and 82° (North or South), IRS alignment should last at least 15 minutes. Consequently :**
  - **SET IRS selectors to NAV**
  - **START the STOP WATCH**
  - **ADJUST the origin airport coordinates to the gate coordinates, if published.**
  - **PRESS the ALIGN IRS prompt, after the 15-minute countdown or later.**

  Note : Beyond 82° North or South, no ADIRS alignment is possible.

Flight

- **Takeoff :**

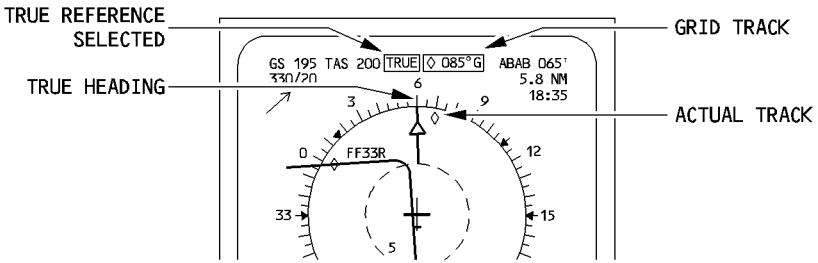
  – **If the "CHECK NORTH REF" amber message comes up on the ND and MCDU, verify that the NORTH REF selection matches the origin airport reference.**

  Note : The "CHECK NORTH REF" amber message and the associated alerts are dependant of a correct coding of the airport North reference (TRUE/MAG) in the navigation database. The runway orientation displayed on ND is also affected if the airport North reference is not correctly coded.

- **Cruise :**

  When reaching an area where the heading reference should be changed (oceanic area, airway or polar track defined in TRUE reference ...) ;

  – **SELECT TRUE by pressing the NORTH REF pushbutton.**
  When reaching 65 N with TRUE reference selected, the GRID TRACK is provided on the ND's upper right box. The ND compass still displays true track and heading. GRID TRK along with XTK are the cues to be used to monitor the proprer lateral guidance.



If the "SELECT TRUE" message appears on the ND/MCDU, this indicates that the aircraft has reached the Polar zone with MAG reference still selected in the cockpit. Press the NORTH REF pushbutton to select TRUE.

Note : If this is not achieved, an automatic switching will subsequently occur. The AP will most probably disengage with associated warnings.
In such a case :
Press the NORTH REF pushbutton to select "TRUE".
Re-engage the AP.

– Use of VOR/DME

En route, the VOR/DME are basically used for either FM NAV ACCY crosscheck, or for reporting a given radial to the ATC.

The FM NAV ACCY crosscheck is achieved, as usual, by comparing the bearing/distance that is displayed on the ND, with the bearing/distance that is displayed on the PROG page.

In case the VOR used is defined in another reference (e.g. MAG) than the one selected in the cockpit (e.g. TRUE), the bearing that is provided on ND is in magenta and is corrected. The VOR-corrected bearing should be within 5° of the FM-computed bearing (taking into account the meridian convergence and the difference in magnetic variation).

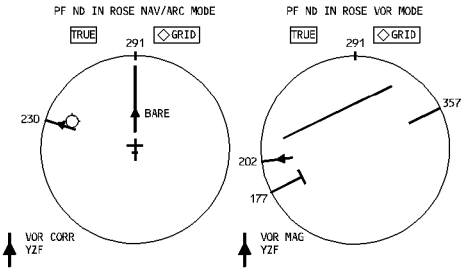
→ In case of doubt, set the NORTH REF to the VOR reference, and check the bearings.

CAUTION

The correction of VOR indications in ROSENAV or ARC ND modes depend on a correct navigation database coding. If the North reference (TRUE/MAG) that is coded for the VOR orientation is not correct, the VOR indication correction will be unduly applied.

If VOR needles are in magenta (CORR), check both the aircraft NORTH REF selection and the VOR station orientation on the navigation charts.

If the aircraft has to report on a given VOR radial, which is defined in a different reference (e.g. MAG) from the cockpit reference (e.g. TRUE), check the RADIAL crossing on the PNF ND set to ROSE VOR mode, or use DDRMI. (Ex : The aircraft flies NCA 24) : (NCA 24 is the TRUE referenced route). ATC requests the aircraft to report on RADIAL 357 from YZF (MAG-referenced).



NFC5-04-0432-009-A100AA

– Use of ADF

The Polar Zone NDBs are quite powerful, and the bearing can be received at long distances.

– Use these NDBs to check the reasonableness of the FM navigation by comparing the ADF bearing, that is displayed on the ND, with the FM-computed bearing, that is displayed on the PROG page.

– Flying the pole
  · In most case, the autopilot will be in NAV mode.
  When approaching the pole, a CHECK HDG message appears, with the associated ECAM Procedure.
    * Disregard the ECAM Procedure.
    The message is due to the fact that the IRSs do not reach the pole simultaneously ; thus the headings do not turn simultaneously from 360 to 180°.
  · In case HDG mode is used (e.g FM1 + 2 failed and Back Up Nav is used)
    * The autopilot onside that the best IRS is to be engaged.
    The offside HDG bug (▽) should be disregarded when close to the pole since, the IRS headings may differ.
– Approach
  · If CHECK NORTH REF amber message comes up on ND and MCDU, verify that the NORTH pushbutton is selected to the destination airport reference.

  Note : The "CHECK NORTH REF" amber message and the associated alerts are dependant of a correct coding of the airport North reference (TRUE/MAG) in the navigation database. The runway orientation displayed on ND is also affected if the airport North reference is not correctly coded.

  · If TRUE is selected for approach, only CAT I ILS approaches may be flown.

FLIGHT PLAN INITIALIZATION THROUGH ACARS

REQUEST FOR ACTIVE FLIGHT PLAN INITIALIZATION BEFORE ENGINE START

R Before engine start, the pilot may request a route for the active flight plan. When the route is received, "AOC ACT F-PLN UPLINK" message is displayed on the MCDU indicating that the flight plan has been received and automatically inserted.

After engine start, it is not possible to initialize directly the active flight plan since the received flight plan is automatically routed into the secondary, and the MDCU displays "AOC SEC F-PLN UPLINK".

PROCEDURE

– PRESS the INIT REQUEST * prompt.

– The star (*) disappears, and dashes appear in all the data fields, except :

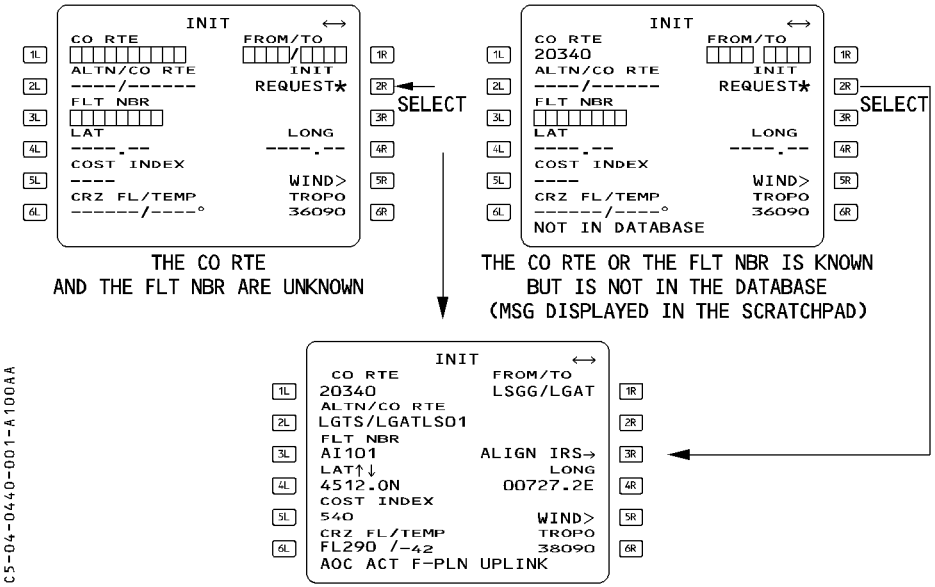
· CO RTE, FLT NBR, if previously displayed and

· fields with default values.

The star is not displayed when the FMGS cannot communicate with the ACARS. No request can be sent.

When an active flight plan exists, the INIT REQUEST prompt is removed from the active INIT page and no request can be sent for the active flight plan. If a flight plan is entered manually after the request, the uplink message is routed to the secondary flight plan.

R



NFC5-04-0440-001-A100AA

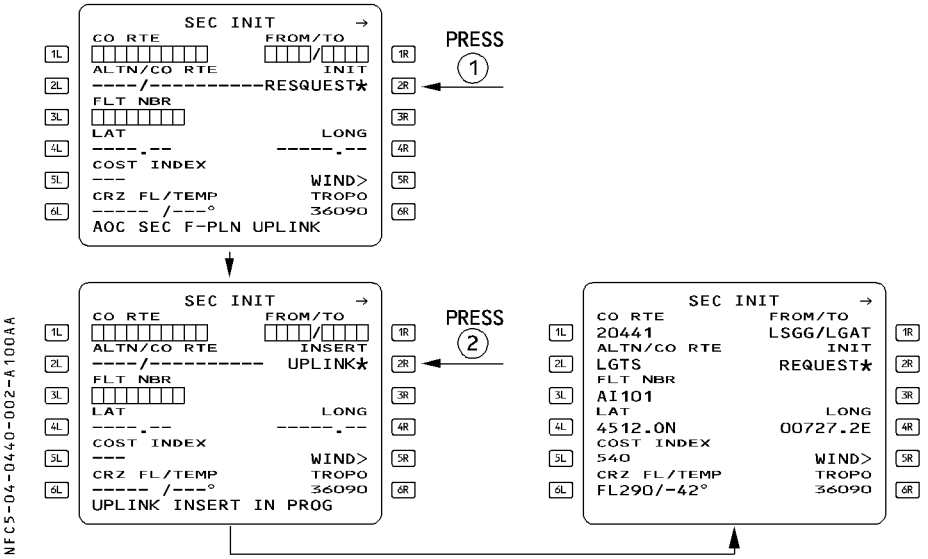
REQUEST FOR SECONDARY FLIGHT PLAN

A request for a secondary flight plan can be initiated anytime. Any flight plan received after engine start is automatically routed into the secondary flight plan.
When the flight plan is received, a message "AOC SEC F-PLN UPLINK" is displayed on the MCDU scratchpad.

R Before engine start, and if the SEC F-PLN is empty, any uplinked flight plan is automatically
R inserted into the secondary flight plan, and no flight crew action is required.
R After engine start, or if the SEC F-PLN is not empty, the flight crew must manually insert
R the uplinked flight plan via INSERT UPLINK prompt.

PROCEDURE TO INSERT OR REJECT A SECONDARY FLIGHT PLAN

When the uplink message is received, the the INIT REQUEST prompt of the INIT A page is replaced by INSERT UPLINK (2R field). Pressing the 2R key will insert the flight plan into the secondary one. Clearing the prompt will reject it.
If a temporary flight plan or a DIR TO is in progress, the uplink insertion is not accepted until the temporary flight plan or the DIR TO is completed.



FLIGHT PLAN INITIALIZATION THROUGH ACARS ◁

REQUEST FOR ACTIVE FLIGHT PLAN INITIALIZATION BEFORE ENGINE START

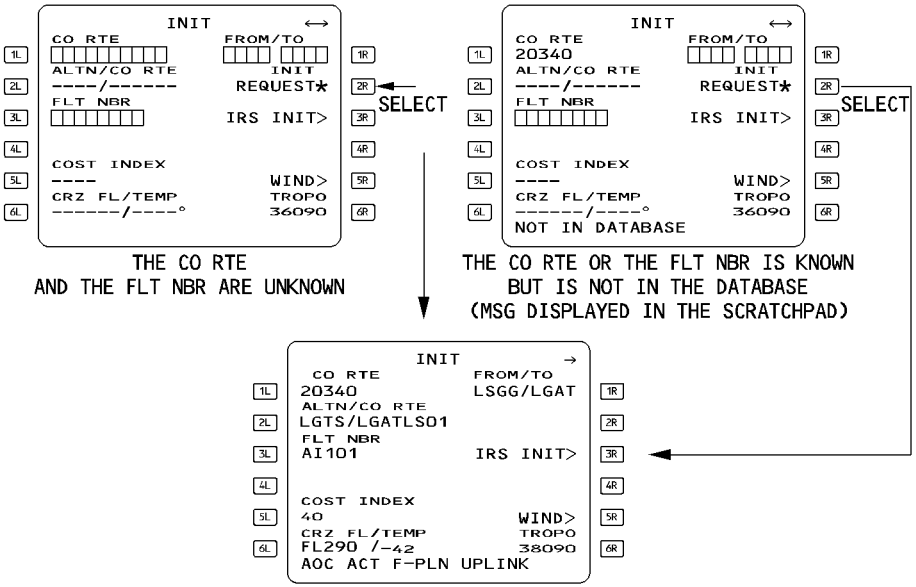
Before engine start, the crew may request a route for the active flight plan. When the route is received, "AOC ACT F-PLN UPLINK" message is displayed on the MCDU indicating that the flight plan has been received and automatically inserted.
After engine start, it is not possible to initialize directly the active flight plan since the received flight plan is automatically routed into the secondary, and the MDCU displays "AOC SEC F-PLN UPLINK".

PROCEDURE

– PRESS the INIT REQUEST * prompt.

– The star (*) disappears, all data fields are dashed except :
  · CO RTE, FLT NBR if previously displayed and
  · default values.

The star is not displayed when the FMGS cannot communicate with the ACARS. No request can be sent.
When an active flight plan exists, INIT REQUEST prompt is removed from the active INIT page and no request can be sent for the active flight plan. If a flight plan is entered manually after the request, the uplink message is routed to the secondary.



NFC5-04-0440-001-A204AA

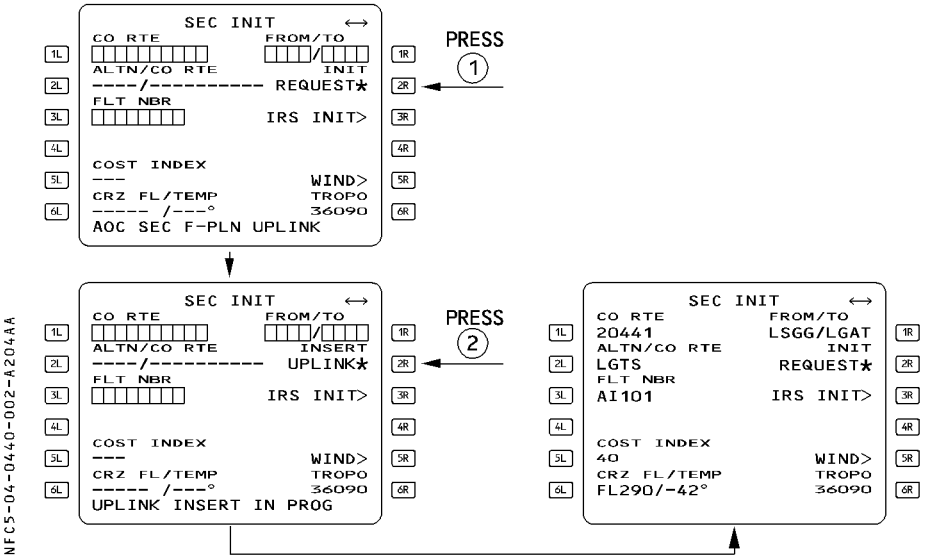
REQUEST FOR SECONDARY FLIGHT PLAN

A request for secondary flight plan can be initiated anytime. Any flight plan received after engine start is automatically routed into the secondary flight plan.
When the flight plan is received, a message "AOC SEC F-PLN UPLINK" is displayed on the MCDU scratchpad.

R Before engine start, and if the SEC F-PLN is empty, any uplinked flight plan is automatically
R inserted into the secondary flight plan, and no flight crew action is required.
R After engine start, or if the SEC F-PLN is not empty, the flight crew must manually insert
R the uplinked flight plan via INSERT UPLINK prompt.

PROCEDURE TO INSERT OR REJECT A SECONDARY FLIGHT PLAN

When the uplink message is received, the INIT REQUEST prompt of INIT A page is replaced by INSERT UPLINK (2R field). Pressing the 2R key will insert the flight plan into the secondary. Clearing the prompt will reject it.
If a temporary flight plan or a DIR TO is in progress, the uplink insertion is not accepted until the temporary flight plan or the DIR TO is completed.



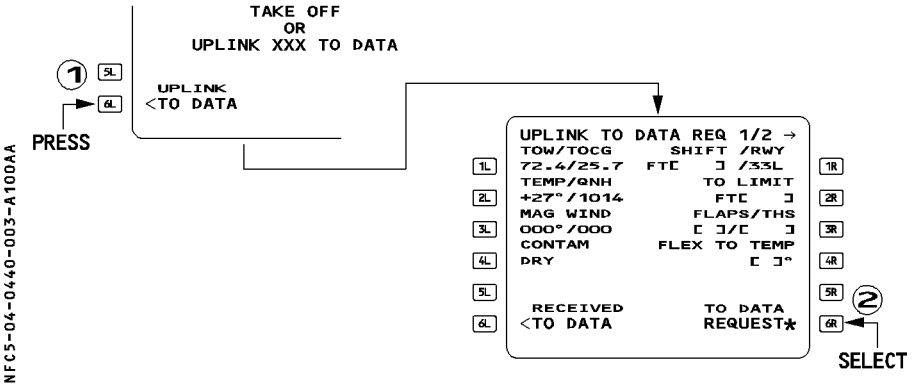
TAKEOFF DATA

The takeoff data may be requested in the preflight or done phase for the active flight plan only. It is always associated with the active flight plan message.

REQUEST FOR TAKEOFF DATA

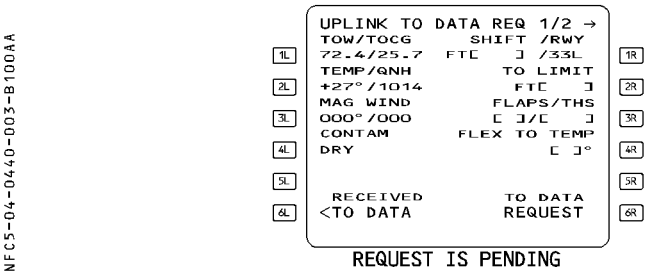
In order to obtain takeoff data from the ground station :

- **SELECT the UPLINK TO DATA [6L] key.**
- **SEND the request by pressing the "TO DATA REQUEST" [6R] key.**



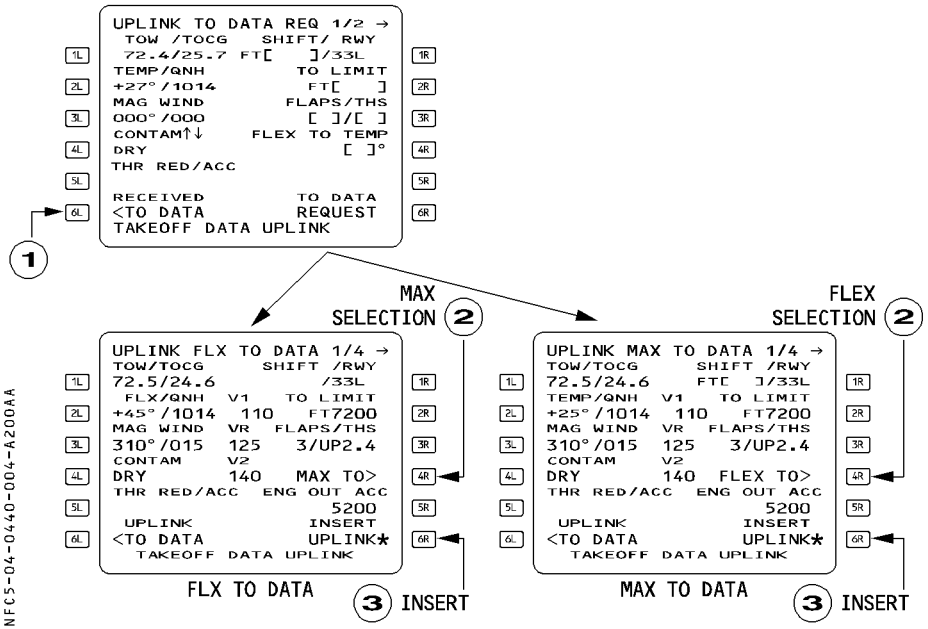
When TO DATA REQUEST is sent, data of the TO DATA REQ page are locked in and the star displayed in the 6R field is removed.

R



PROCEDURE TO INSERT UPLINK TAKEOFF DATA

– PRESS the 6L key "RECEIVED TO DATA" when the message TAKEOFF DATA UPLINK is displayed.



This displays the uplink data on 2 different pages : UPLINK MAX TO DATA
UPLINK FLX TO DATA

– SELECT the data corresponding to the thrust to be used (MAX or FLEX) by pressing [4R].

– SELECT the active runway data by slewing the pages (1/4... 4/4).

– PRESS the [6R] key "INSERT UPLINK".

UPLINK MAX TO DATA and UPLINK FLX TO DATA pages are not modifiable.
If the takeoff data displayed on this page are not relevant to the active runway entered in the flight plan, the INSERT UPLINK prompt is not displayed.

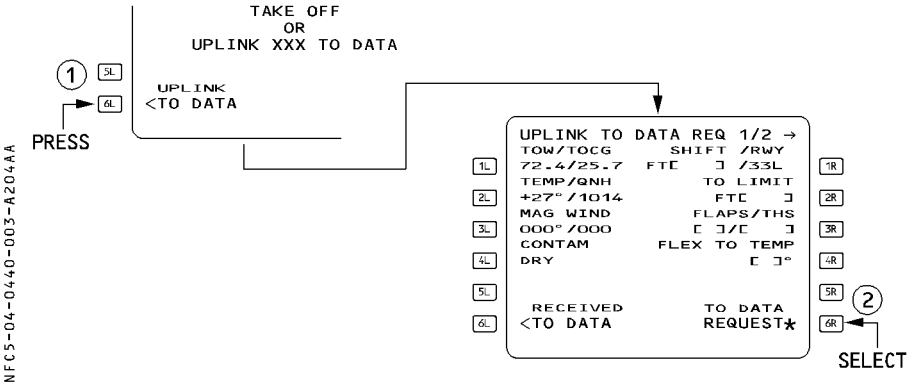
TAKEOFF DATA

The takeoff data may be requested in preflight or done phase for the active flight plan only. It is always associated with the active flight plan message.

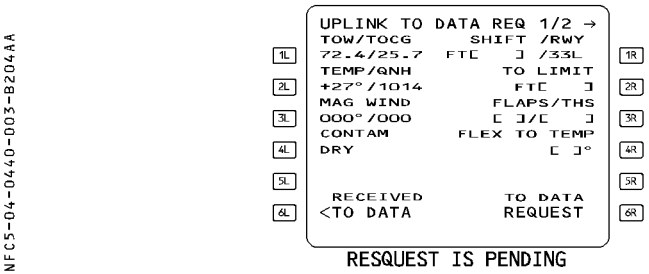
REQUEST FOR TAKEOFF DATA

In order to obtain takeoff data from the ground station :

- **SELECT UPLINK TO DATA [6L] key.**
- **SEND the request by pressing "TO DATA REQUEST" [6R] key.**

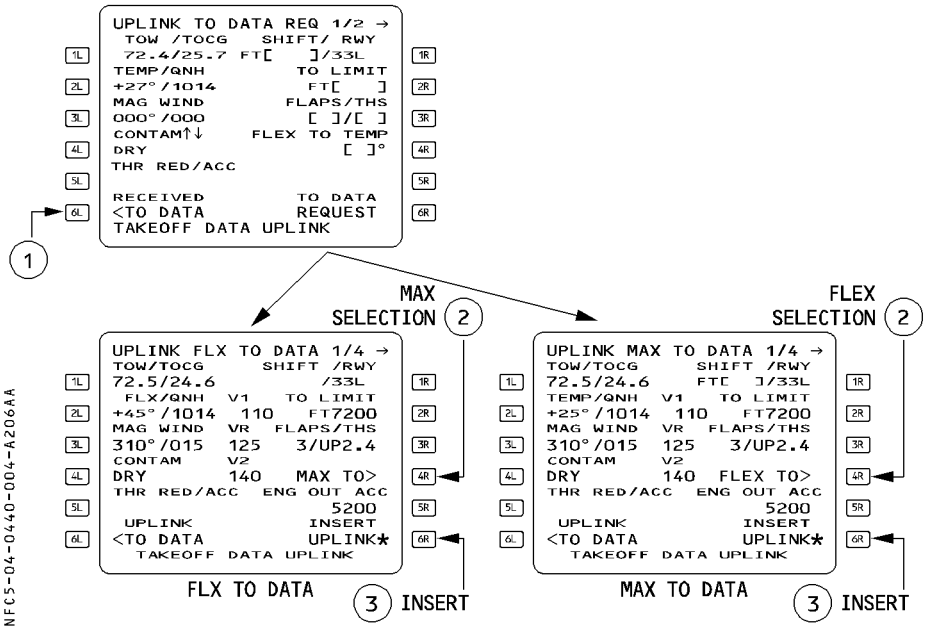


When TO DATA REQUEST is sent, data of the TO DATA REQ page are locked in and the star displayed in 6R field is removed.



PROCEDURE TO INSERT UPLINK TAKEOFF DATA

– PRESS the 6L key "RECEIVED TO DATA" when the message TAKEOFF DATA UPLINK is displayed.



This displays the uplink data on 2 different pages : UPLINK MAX TO DATA
UPLINK FLX TO DATA

– SELECT the data corresponding to the thrust to be used (MAX or FLEX) by pressing [4R]

– SELECT the active runway data by slewing the pages (1/4... 4/4).

– PRESS the [6R] key "INSERT UPLINK"

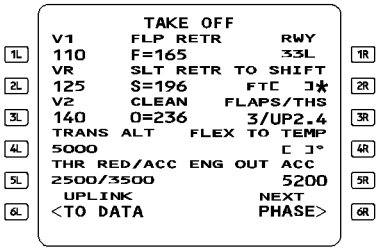
UPLINK MAX TO DATA and UPLINK FLX TO DATA pages are not modifiable.
If the takeoff data displayed on this page are not relevant to the active runway entered in the flight plan, the INSERT UPLINK prompt is not displayed.

CAUTION

Once TAKEOFF DATA have been inserted, the uplinked "MAG WIND" value is transferred to the WIND pages, and is therefore used for fuel/time predictions.

When the takeoff data have been inserted, the PERF TO page is updated with of the new data.

NFC5-04-0440-005-A100AA



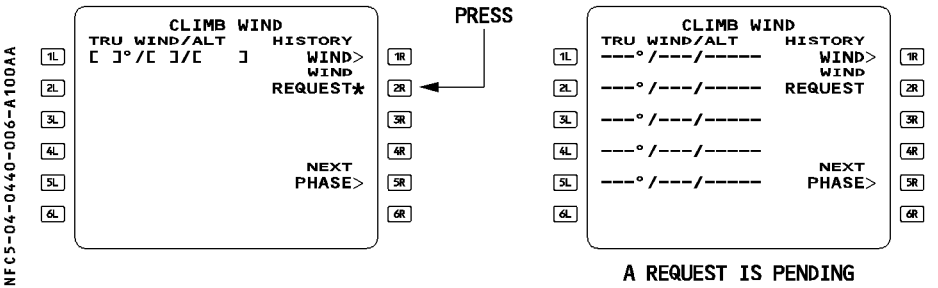
WIND DATA

REQUEST FOR WIND DATA

To send a wind request, press the "WIND REQUEST" selection key on any of the wind pages. This request is automatically sent to the ground for one or more flight phases and for the selected flight plan (primary or secondary). The content of the wind request message is not dependent on the selected wind page (CLIMB, CRUISE or DESCENT) but on the flight phase in progress.

- For an active flight plan or secondary flight plan that is a "COPY ACTIVE", a wind request sent by the flight crew :
  - During the preflight or takeoff phase, initiates a demand for climb, cruise, descent and alternate winds.
  - During the climb and cruise phase, initiates a demand for cruise, descent and alternate winds.
  - During descent/approach and go around, no wind request is possible.
- For a secondary flight plan that is not a "COPY ACTIVE" there is no restriction linked to the flight phase.

R Before engine start, and if data has not been entered in any WIND page for the flight
R plan, the uplinked wind data is automatically inserted into the flight plan, and no flight
R crew action is required.
R If the uplinked wind message is received after engine start, or if data has been entered
R in any WIND page of the flight plan, the flight crew must manually insert the uplinked
R wind data via the INSERT UPLINK prompt.

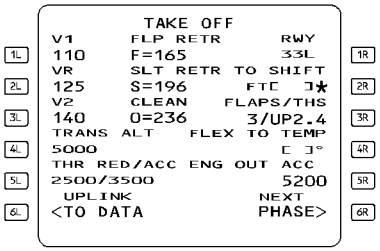


A REQUEST IS PENDING

When the amber star following the "WIND REQUEST" is not displayed, the FM is not able to communicate with the ACARS and the flight crew cannot send any request. When a temporary flight plan is active or a DIR TO is selected, an uplink message cannot be displayed and the "WIND UPLINK PENDING" scratchpad message remains displayed until the action is completed.

When the takeoff data have been inserted, the PERF TO page is amended of the new data.

NFC5-04-0440-005-A204AA



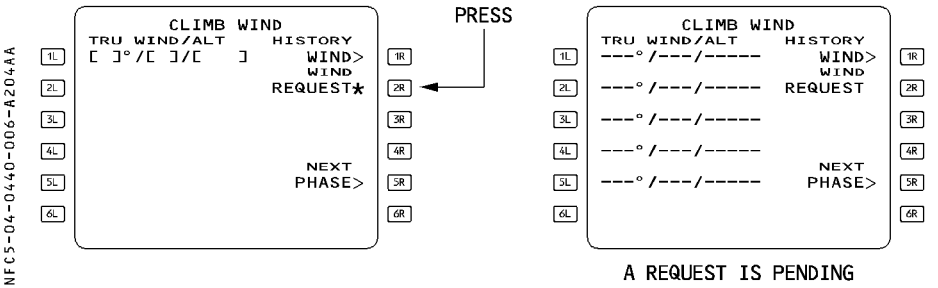
WIND DATA

REQUEST FOR WIND DATA

To send a wind request, press the "WIND REQUEST" selection key of any wind pages. This request is automatically sent to the ground for one or more flight phases and for the selected flight plan (primary or secondary). The content of the wind request message is not dependent on the selected wind page (CLIMB, CRUISE or DESCENT) but on the flight phase in progress.

- For active flight plan or secondary flight plan that is a "COPY ACTIVE", a wind request sent by the crew :
  - during preflight or takeoff phase, initiates a demand for climb, cruise, descent and alternate winds.
  - during climb and cruise phase, initiates a demand for cruise, descent and alternate winds.
  - during descent/approach and go around, no wind request is possible.
- For secondary flight plan that is not a "COPY ACTIVE" there is no restriction linked to flight phase.

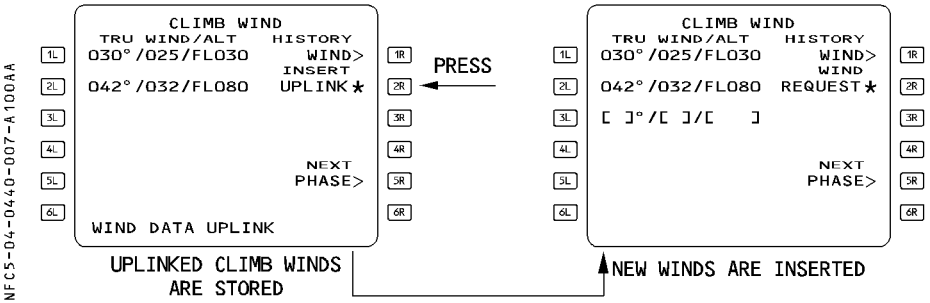
R Before engine start, and if data has not been entered in any WIND page for the flight
R plan, the uplinked wind data is automatically inserted into the flight plan, and no flight
R crew action is required.
R If the uplinked wind message is received after engine start, or if data has been entered
R in any WIND page of the flight plan, the flight crew must manually insert the uplinked
R wind data via the INSERT UPLINK prompt.



When the amber star following the "WIND REQUEST" is not displayed, the FM is not able to communicate with the ACARS and the pilot cannot send any request. When a temporary flight plan is active or a DIR TO is selected, an uplink message cannot be displayed and the "WIND UPLINK PENDING" scratchpad message remains displayed until the action is completed.

PROCEDURE TO INSERT WIND DATA

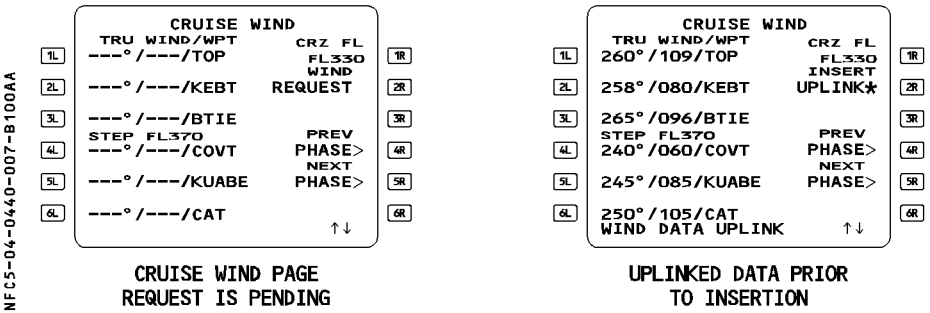
When the uplink message is received, the 2R field is modified, the amber "WIND REQUEST" is replaced by the blue "INSERT UPLINK*". This prompt, when pressed, enables the flight crew to insert the uplink wind data, phase by phase.
To access, review, insert or delete the uplink wind data of other phases, the flight crew uses the "NEXT PHASE" or "PREV PHASE" key.
If the flight crew is not satisfied with the uplink winds, the flight crew will delete the winds, phase by phase clearing the "INSERT UPLINK" prompt. This will delete all the uplinked winds of the selected flight phase.



CLIMB WIND page

When a request is pending, the history WIND page cannot be accessed.
When the climb phase is active, the flight crew cannot request or modify the climb winds of the active flight plan, or the secondary flight plan, if it is a "COPY ACTIVE".

CRUISE WIND page



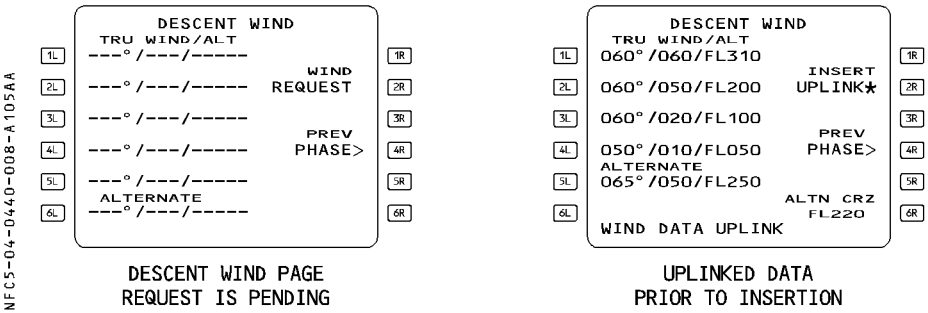
A wind request sent during the cruise phase will apply to downpath waypoints of the cruise, descent, approach and alternate phases.

- If the uplink message contains more data and waypoints than the flight plan, the winds at extra waypoints are not considered and are automatically discarded. This is transparent to the flight crew.
- Clearing the INSERT UPLINK* prompt deletes all uplink wind data of the cruise phase. The CRUISE page reverts to the previous data.

Note : During cruise, whenever uplink wind data is received and not inserted or cancelled on the CRUISE WIND page, access to the DIR TO function is not possible. The "WIND UPLINK EXISTS" message is displayed on the MCDU scratchpad.
Insert or cancel the uplinked wind message first and then access the DIR TO function.

DESCENT WIND page

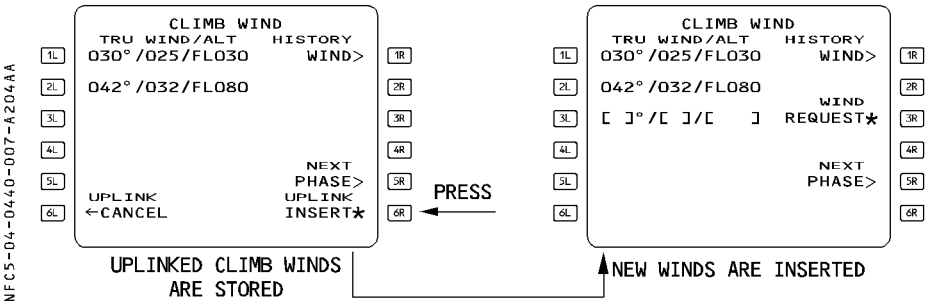
The procedures to insert, review or delete descent winds during the preflight, climb or cruise phase are described in the above wind general procedure.



If the alternate wind is not available, dashes are displayed in the field.
In the descent, approach or go around phases, the flight crew cannot request or modify the descent winds of the active flight plan, or the secondary flight plan, if it is a "COPY ACTIVE".

PROCEDURE TO INSERT WIND DATA

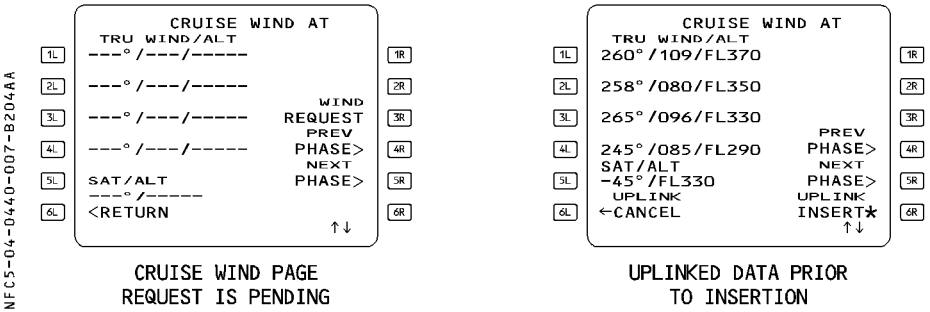
When the uplink message is received, "WIND REQUEST" disappears from the 3R field.
To access, review, insert or delete the uplink wind data of other phases, the crew uses "NEXT PHASE" or "PREV PHASE" key.
If the crew is not satisfied with the uplink winds, he can delete them using the "UPLINK CANCEL" prompt (6L field). This will delete all uplinked winds.



CLIMB WIND page

When a request is pending, the history WIND page cannot be accessed.
When the climb phase is active, the crew cannot request neither modify the climb winds of the active flight plan or secondary flight plan if it is a copy active.

CRUISE WIND page

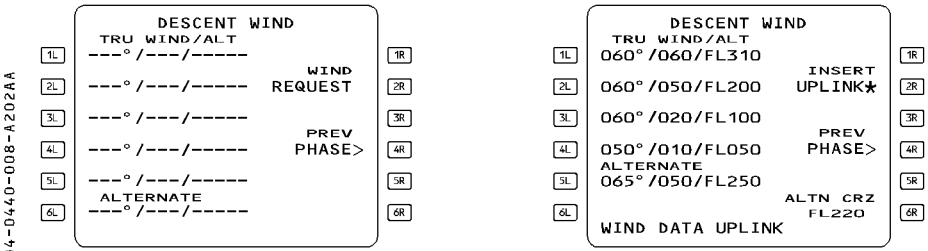


A wind request sent during cruise phase will apply for downpath waypoints of the cruise, descent, approach and alternate phases.

- If the uplink message contains more data and waypoints than the flight plan, the winds at extra waypoints are not considered and automatically discarded. This is transparent to the pilot.
- Clearing the INSERT UPLINK* prompt deletes all uplink wind data of the cruise phase. Cruise page reverts to the previous data.

DESCENT WIND page

The procedures to insert, review or delete descent winds during preflight, climb or cruise phase are described in the above wind general procedure.



NFC5-04-0440-008-A202AA

DESCENT WIND PAGE
REQUEST IS PENDING

UPLINKED DATA
PRIOR TO INSERTION

If the alternate wind is not available, dashes are displayed in the field.
In descent, approach or go around phases, the pilot cannot request or modify the descent winds of the active flight plan or secondary flight plan if it is a “COPY ACTIVE”.

PRINT FUNCTION

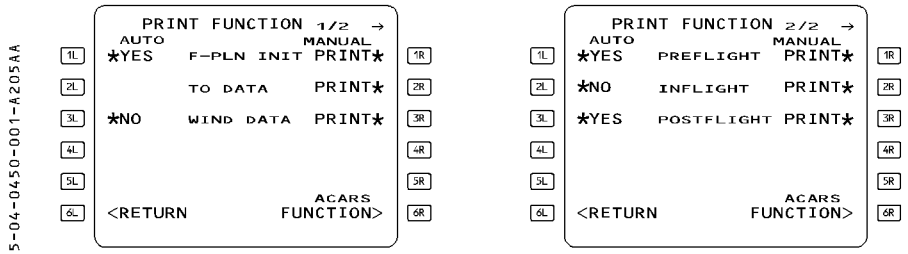
The PRINT function allows various reports to be printed either automatically (when linked to ACARS or ATSU ◁) or manually.
The manual PRINT function allows printing of FM-generated flight reports and additional data :

F-PLN	INITialization data
T.O.	Data
WIND	Data
PREFLIGHT	REPORT
IN FLIGHT	REPORT
POSTFLIGHT	REPORT

A detailed description of the PRINT FUNCTION pages is provided in 4.03.25.
The print function is available if ACARS or ATSU (◁) are available or not.
The various flight reports contain most of the prediction information required by the flight crew to monitor the progress of the flight. The resulting documents can therefore be used as realistic master documents, based on the latest data provided by the flight crew to the computer, in terms of ATC clearances and weather information.

PRINT FUNCTION ACCESS

The PRINT FUNCTION page is accessed :
- From the DATA INDEX A PAGE, or
- From the AOC FUNCTION page (if ACARS is installed).



NFC5-04-0450-001-A205AA

PRINT FUNCTION PAGE 1 PRINT FUNCTION PAGE 2

Note : For automatic printing, "time" is the time of the reception of the message. For manual printing, "time" is the time of the print request.

ON GROUND BEFORE ENGINE START

When the overall F-PLN data (lateral, vertical including winds, steps constraints) and the ZFW and ZFWCG values have been inserted :

– **SELECT the FUEL PLANNING prompt [3R]**

● **If the computed BLOCK fuel does not correspond to the actual block fuel required for the flight :**

– **ENTER the actual block fuel required for the flight in the [2R] field**

– **PRINT the PREFLIGHT report.**
The flight crew may then use the PREFLIGHT report to monitor the progress of the flight.

Note : Before printing the PREFLIGHT report, the flight crew must check that the F-PLN is complete (all F-PLN discontinuities must be cleared) and that all the F-PLN elements (including winds, steps, constraints, alternate airport) have been inserted, in order to obtain an accurate PREFLIGHT report.

PRINT FUNCTION

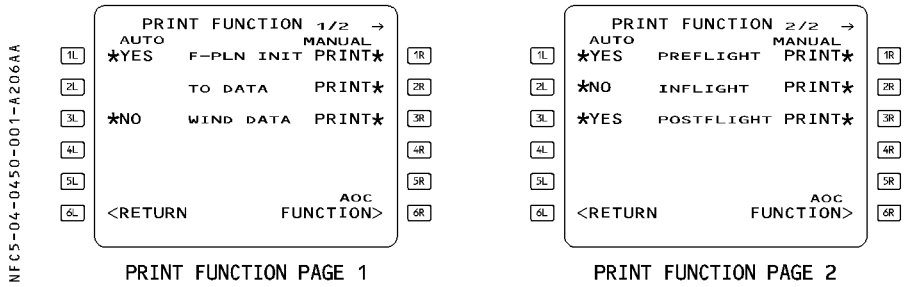
The PRINT function allows various reports to be printed either automatically (when linked to ACARS or ATSU ◁) or manually.
The manual PRINT function allows printing of FM-generated flight reports and additional data.

F-PLN	INITialization data
T.O.	Data
WIND	Data
PREFLIGHT	REPORT
IN FLIGHT	REPORT
POSTFLIGHT	REPORT

A thorough description of the PRINT FUNCTION pages is provided in 4.03.28
The print function is available whether ACARS or ATSU (◁) are available or not.
The various flight reports collect most of the prediction information required by the crew to monitor the progress of the flight. The resulting documents may thus be used as realistic master documents, based on the latest data provided by the crew to the computer in terms of ATC clearances and weather information.

PRINT FUNCTION ACCESS

The PRINT FUNCTION page is accessed :
- From the DATA INDEX A PAGE, or
- From the AOC FUNCTION page (if ACARS is installed).



NFC5-04-0450-001-A206AA

PRINT FUNCTION PAGE 1 PRINT FUNCTION PAGE 2

Note : For an automatic printing, "time" is the time of the reception of the message. For a manual printing, "time" is the time of the print request.

ON GROUND BEFORE ENGINE START

Once the overall F-PLN data (lateral, vertical including winds, steps, constraints) and the ZFW and ZFWCG values have been inserted :

– **SELECT the FUEL PLANNING prompt [3R],**

● **If the computed BLOCK fuel does not correspond to the actual block fuel required for the flight :**

  – **ENTER the actual block required for the flight in the [2R] field,**

– **PRINT the PREFLIGHT report.**
The flight crew may then use the PREFLIGHT report to monitor the progress of the flight.

Note : Before printing the PREFLIGHT report, the flight crew must check that the F-PLN is complete (all F-PLN discontinuities must be cleared) and that all the F-PLN elements (including winds, steps, constraints, alternate airport) have been inserted, in order to obtain an accurate PREFLIGHT report.

EXAMPLE

R

FM PREFLIGHT REPORT

DATE : 24 OCT 06
TIME : 07 : 24

A/C TYPE	: A320-200	DATABASE	: AB49402001
ENG TYPE	: CFM56-5B4	CYCLE	: 29 SEP-26 OCT
FLT NUMBER	: AIB 105	FROM/TO	: EINN/LFBO
CO RTE	:	ALTN	: LFBP
ALTN CO RTE	:		
PERF FACTOR	: +1.5	COST INDEX	: 100
IDLE FACTOR	: +0.0		

CRUISE FL/STEP START WPT
CRZ FL 1 : FL410

FLIGHT PLAN DATA

	DIST	TIME	CRZ FL	
DEST-LFBO	: 714	01:32	FL410	
ALTN-LFBP	: 80	01:52	FL220	
DEP RWY	: 24		ARV PRC	: . . . . .
DEP PRC	:		APR PRC	: . . . . .
			ARV RWY	: . . . . .

WPT	TIME	SPD/ALT	FOB	T. WIND	TAS	SAT	CRS	DIST
PREDICTED VALUES								
EINN24	00:00	133/-95	13.6	TL/040	-	+11	183	0
1520	00:00	159/1574	13.2	TL/040	163	+12	240	2
SHA	00:02	190/FL70	13.0	TL/040	211	+01	059	3
CRK	00:10	295/FL300	11.4	TL/040	459	-44	173	55
TIVLI	00:16	.82/FL400	11.2	TL/040	467	-57	140	50
LND	00:27	.84/FL410	11.0	TL/040	482	-57	140	99
NAKID	00:33	.84/FL410	10.9	TL/040	482	-57	130	46
LIZAD	00:34	.84/FL410	9.2	TL/040	482	-57	129	14
BALOT	00:38	.84/FL410	8.7	TL/040	482	-57	130	37
BERAT	00:41	.84/FL410	8.2	TL/040	482	-57	129	23
DIN	00:46	.84/FL410	7.6	TL/040	482	-57	128	47
NTS	00:56	.84/FL410	7.3	TL/040	482	-57	173	88
MINEL	01:02	.84/FL410	7.1	TL/040	482	-57	153	46
VENAR	01:05	.84/FL410	6.6	TL/040	482	-57	152	25
CGC	01:08	.84/FL410	6.1	TL/040	482	-57	153	34
VELIN	01:14	320/FL280	5.9	TL/040	482	-41	158	45
AGN	01:25	250/FL60	5.2	TL/040	274	+02	157	72
LFBO	01:32	128/550	5.2	TL/040	129	+14	001	27

FUEL PREDICTIONS

TAXI :	0.2	ZFWCG	: 25.0 %
TRIP (DEST) :	8.4	ZFW	: 51.2
RSV :	1.3	TOW	: 66.5
ALTN :	0.6	LW	: 55.9
FINAL :	1.8	CG	: —.-
EXTRA :	0.8		
BLOCK :	15.5		

MISC PERF DATA

TROPOPAUSE :	36090
CLB TRANS :	5000
CRZ TEMP :	-60

IN FLIGHT

When the aircraft has reached the CRZ FL, and when all the latest ATC clearances have been inserted in the FM, and when all the WINDS/STEPS have been properly updated :

– **ACCESS the PRINT FUNCTION page**

– **PRINT the INFLIGHT REPORT**
The inflight report provides the list of all the overflown F-PLN waypoints (HISTORY VALUES) with their associated data (Time, Alt, Fuel, ...), and the predictions to all the downpath waypoints (PREDICTED VALUES).
This new document replaces the PREFLIGHT report, since it carries all the latest expected F-PLN changes. It is the new applicable master document used to monitor the progress of the flight.
The inflight report will be printed after each important F-PLN modification.

Note : If the selected Fuel Unit option is pounds, the HISTORY FOB values may be incorrectly printed in tons on the INFLIGHT REPORT. The CURRENT and PREDICTED FOB values, however, are correctly printed in pounds.

EXAMPLE

R

FM PREFLIGHT REPORT

DATE : 24 OCT 06
TIME : 07 : 24

A/C TYPE	: A330-300	DATABASE	: AB49402001
ENG TYPE	: CF6-80E1A2	CYCLE	: 29 SEP–26 OCT
FLT NUMBER	: AIB 105	FROM/TO	: EINN/LFBO
CO RTE	:	ALTN	: LFBP
ALTN CO RTE	:		
PERF FACTOR	: +1.5	COST INDEX	: 100
IDLE FACTOR	: +0.0		

CRUISE FL/STEP START WPT
CRZ FL 1 : FL410

FLIGHT PLAN DATA

	DIST	TIME	CRZ FL	
DEST-LFBO	: 714	01:32	FL410	
ALTN-LFBP	: 80	01:52	FL220	
DEP RWY	: 24		ARV PRC	: . . . . .
DEP PRC	:		APR PRC	: . . . . .
			ARV RWY	: . . . . .

WPT	TIME	SPD/ALT	FOB	T. WIND	TAS	SAT	CRS	DIST
PREDICTED VALUES								
EINN24	00:00	133/-95	13.6	TL/040	-	+11	183	0
1520	00:00	159/1574	13.2	TL/040	163	+12	240	2
SHA	00:02	190/FL70	13.0	TL/040	211	+01	059	3
CRK	00:10	295/FL300	11.4	TL/040	459	-44	173	55
TIVLI	00:16	.82/FL400	11.2	TL/040	467	-57	140	50
LND	00:27	.84/FL410	11.0	TL/040	482	-57	140	99
NAKID	00:33	.84/FL410	10.9	TL/040	482	-57	130	46
LIZAD	00:34	.84/FL410	9.2	TL/040	482	-57	129	14
BALOT	00:38	.84/FL410	8.7	TL/040	482	-57	130	37
BERAT	00:41	.84/FL410	8.2	TL/040	482	-57	129	23
DIN	00:46	.84/FL410	7.6	TL/040	482	-57	128	47
NTS	00:56	.84/FL410	7.3	TL/040	482	-57	173	88
MINEL	01:02	.84/FL410	7.1	TL/040	482	-57	153	46
VENAR	01:05	.84/FL410	6.6	TL/040	482	-57	152	25
CGC	01:08	.84/FL410	6.1	TL/040	482	-57	153	34
VELIN	01:14	320/FL280	5.9	TL/040	482	-41	158	45
AGN	01:25	250/FL60	5.2	TL/040	274	+02	157	72
LFBO	01:32	128/550	5.2	TL/040	129	+14	001	27

FUEL PREDICTIONS

TAXI :	0.2	ZFWCG	: 25.0 %
TRIP (DEST) :	8.4	ZFW	: 51.2
RSV :	1.3	TOW	: 66.5
ALTN :	0.6	LW	: 55.9
FINAL :	1.8	CG	: —.-
EXTRA :	0.8		
BLOCK :	15.5		

MISC PERF DATA

TROPOPAUSE :	36090
CLB TRANS :	5000
CRZ TEMP :	-60

IN FLIGHT

Once the aircraft has reached the CRZ FL once, all the latest ATC clearances have been inserted in the FM, once all the WINDS/STEPS have been properly updated :

- **ACCESS to the PRINT FUNCTION page**

- **PRINT the INFLIGHT REPORT**
  The inflight report provides the list of all the overflown F-PLN waypoints (HISTORY VALUES) with their associated data (Time, Alt, Fuel, ...), and the predictions to all the downpath waypoints (PREDICTED VALUES).
  This new document replaces the PREFLIGHT report, since it carries all the latest expected F-PLN changes. It is the new applicable master document used to monitor the progress of the flight.
  The inflight report will be printed after each important F-PLN modification.

EXAMPLE

R

FM INFLIGHT REPORT

DATE : 24 OCT 06
TIME : 09 : 24

A/C TYPE	: A320-200	DATABASE	: AB49402001
ENG TYPE	: CFM56-5B4	CYCLE	: 29 SEP-26 OCT
FLT NUMBER	: AIB 105	FROM/TO	: LFBO/EINN
CO RTE	:	ALTN	: EIDW
ALTN CO RTE	:		
PERF FACTOR	: +1.5	COST INDEX	: 90
IDLE FACTOR	: +0.0		

CRUISE FL/STEP START WPT
CRZ FL 1 : FL390
FLIGHT PLAN DATA

	DIST	TIME	CRZ FL	
DEST-EINN	: 730	10:24	FL390	
ALTN-EIDW	: 106	10:50	FL220	
DEP RWY	: 14R		ARV PRC	: . . . . .
DEP PRC	: LMG3A		APR PRC	: . . . . .
			ARV RWY	: . . . . .

WPT	TIME	SPD/ALT	FOB	T. WIND	TAS	SAT	CRS	DIST
HISTORY VALUES								
LFB014R	08:29	126/536	13.6	HD/070	-	+12	142	0
1000	08:30	141/982	13.2	056°/003	141	+10	143	2
CURRENT POSITION : N43-37.9/E001-22.0								
	08:32	252FL63	13.6	HD/070	297	-11	350	10
PREDICTED VALUES								
OSKAM	08:34	320/FL130	10.4	HD/070	387	-11	350	14
LMG	08:52	.84/FL390	10.2	HD/070	482	-57	359	119
VERAC	08:59	.84/FL390	10.0	HD/070	482	-57	310	48
MAIXE	09:01	.84/FL390	9.9	HD/070	482	-57	310	18
NTS	09:11	.84/FL390	8.2	HD/070	482	-57	310	70
DIN	09:24	.84/FL390	7.7	HD/070	482	-57	352	88
BERAT	09:31	.84/FL390	7.2	HD/070	482	-57	309	47
BALOT	09:34	.84/FL390	6.6	HD/070	482	-57	309	23
LIZAD	09:40	.84/FL390	6.3	HD/070	482	-57	310	37
NAKID	09:42	.84/FL390	6.1	HD/070	482	-57	309	14
LND	09:48	.84/FL390	5.6	HD/070	482	-57	309	46
TIVLI	10:03	.84/FL390	5.1	HD/070	482	-57	322	99
CRK	10:10	320/FL170	4.9	HD/070	407	-19	319	50
SHA	10:23	128/900	4.2	HD/070	130	+13	353	55
EINN	10:24	128/100	4.2	HD/070	128	+15	001	2

FUEL INFORMATION AT 08:32

WEIGHT	CG	FOB	RSV/RSW%	FINAL	EXTRA
65.0	37.3%	13.6	0.4/5.0%	3.1	2.8

Note : In case of a major failure such as an engine out, a new print will be done when time permits.

REACHING THE GATE AFTER LANDING

The POSTFLIGHT REPORT gives a complete list of all the overflown waypoints during the flight (HISTORY VALUES).
Furthermore it provides :
– FUEL/TIME summary
– IRS Drift and G/S
When at the gate, after engine shutdown :
– ACCESS the PRINT FUNCTION page
– PRINT the POSTFLIGHT REPORT

Note : If the selected Fuel Unit option is pounds, the HISTORY FOB values may be incorrectly printed in tons on the POSTFLIGHT REPORT.

EXAMPLE

R

FM INFLIGHT REPORT

DATE : 24 OCT 06
TIME : 09 : 24

A/C TYPE	: A330-300	DATABASE	: AB49402001
ENG TYPE	: CF6-80E1A2	CYCLE	: 29 SEP-26 OCT
FLT NUMBER	: AIB 105	FROM/TO	: LFBO/EINN
CO RTE	:	ALTN	: EIDW
ALTN CO RTE	:		
PERF FACTOR	: +1.5	COST INDEX	: 90
IDLE FACTOR	: +0.0		

CRUISE FL/STEP START WPT
CRZ FL 1 : FL390

FLIGHT PLAN DATA

	DIST	TIME	CRZ FL	
DEST-EINN	: 730	10:24	FL390	
ALTN-EIDW	: 106	10:50	FL220	
DEP RWY	: 14R		ARV PRC	: . . . . .
DEP PRC	: LMG3A		APR PRC	: . . . . .
			ARV RWY	: . . . . .

WPT	TIME	SPD/ALT	FOB	T. WIND	TAS	SAT	CRS	DIST
HISTORY VALUES								
LFB014R	08:29	126/536	13.6	HD/070	-	+12	142	0
1000	08:30	141/982	13.2	056°/003	141	+10	143	2
CURRENT POSITION : N43-37.9/E001-22.0								
	08:32	252/FL63	13.6	HD/070	297	-11	350	10
PREDICTED VALUES								
OSKAM	08:34	320/FL130	10.4	HD/070	387	-11	350	14
LMG	08:52	.84/FL390	10.2	HD/070	482	-57	359	119
VERAC	08:59	.84/FL390	10.0	HD/070	482	-57	310	48
MAIXE	09:01	.84/FL390	9.9	HD/070	482	-57	310	18
NTS	09:11	.84/FL390	8.2	HD/070	482	-57	310	70
DIN	09:24	.84/FL390	7.7	HD/070	482	-57	352	88
BERAT	09:31	.84/FL390	7.2	HD/070	482	-57	309	47
BALOT	09:34	.84/FL390	6.6	HD/070	482	-57	309	23
LIZAD	09:40	.84/FL390	6.3	HD/070	482	-57	310	37
NAKID	09:42	.84/FL390	6.1	HD/070	482	-57	309	14
LND	09:48	.84/FL390	5.6	HD/070	482	-57	309	46
TIVLI	10:03	.84/FL390	5.1	HD/070	482	-57	322	99
CRK	10:10	320/FL170	4.9	HD/070	407	-19	319	50
SHA	10:23	128/900	4.2	HD/070	130	+13	353	55
EINN	10:24	128/100	4.2	HD/070	128	+15	001	2

FUEL INFORMATION AT 08:32

WEIGHT	CG	FOB	RSV/RSW%	FINAL	EXTRA
65.0	37.3%	13.6	0.4/5.0%	3.1	2.8

Note : In case of a major failure such as an Engine out, a new print will be done when time permits.

REACHING THE GATE AFTER LANDING

The POSTFLIGHT REPORT gives a complete list of all the overflown waypoints during the flight (HISTORY VALUES).
Furthermore it provides :
– FUEL/TIME summary
– IRS Drift and G/S
Once at the gate, after engine shutdown :
– ACCESS the PRINT FUNCTION page
– PRINT the POST FLIGHT REPORT

Note : The IRS Drift value on the POST FLIGHT REPORT may be erroneous.

EXAMPLE

R

FM POSTFLIGHT REPORT

DATE : 24 OCT 06
TIME : 12 : 05

A/C TYPE	: A320-200	DATABASE	: AB49402001
ENG TYPE	: CFM56-5B4	CYCLE	: 29 SEP-26 OCT
FLT NUMBER	: AIB 105	FROM/TO	: EINN/LFBO
CO RTE	:	ALTN	: LFBP
ALTN CO RTE	:		
PERF FACTOR	: +1.5	COST INDEX	: 90
IDLE FACTOR	: +0.0		

FLIGHT PLAN DATA

	DIST	TIME	CRZ FL		
DEST-LFBO	: —	11:52	FL—		
ALTN/——	: —	—:—	FL—		
DEP RWY	: 06		ARV PRC	: AGN2T	
DEP PRC	:		APR PRC	: VOR32L	
			ARV RWY	: 32L	

WPT	TIME	SPD/ALT	FOB	T. WIND	TAS	SAT	CRS	DIST
HISTORY VALUES								
EINN06	10:17	134/44	17.0	043/005	-	+11	053	0
1550	10:18	163/1536	16.9	235'/019	165	+08	050	2
SHA	10:18	161/1691	16.9	236'/019	163	+08	049	0
ABCRK	10:27	305/FL280	15.1	295'/049	459	-41	149	53
TIVLI	10:33	.80/FL330	14.8	298'/057	448	-64	143	46
LND	10:44	.84/FL330	14.1	320'/034	477	-61	129	111
ABLIZAD	10:51	.84/FL330	13.6	326'/034	474	-61	141	47
ABBERAT	10:58	.84/FL330	12.4	313'/029	480	-59	141	21
ABOIN	11:03	.84/FL330	12.2	326'/030	479	-60	142	44
ABNTS	11:13	.84/FL330	12.0	330'/034	481	-60	142	126
ABVENAR	11:21	.84/FL330	10.2	335'/028	479	-60	143	24
CGC	11:25	.84/FL330	9.7	339'/031	476	-61	150	33
VELIN	11:31	.84/FL330	9.2	352'/028	476	-60	154	45
AGN	11:40	312/FL220	8.6	050'/024	429	-26	149	72
SOTAK	11:40	321/FL190	8.3	052'/025	425	-20	141	5
D191K	11:44	253/FL90	8.1	347'/015	288	+00	137	24
D165R	11:46	253/4360	7.6	309'/014	265	+04	103	11
CD32L	11:49	175/2967	6.9	293'/009	180	+05	322	5
FD32L	11:50	253/FL1609	6.2	308'007	132	+08	323	4
LFB032L	11:52	132/674	6.2	326'/006	131	+11	321	3

FUEL AND TIME SUMMARY

START UP		SHUT DOWN	
FUEL : 17.0		FUEL	: 4.2
WEIGHT : 75.8		WEIGHT	: 65.0
TIME : 10.09		TIME	: 12:01
TO TIME : —.-		LDG TIME	: 11:52

IRS DATA AT : LFB032L

	IRS 1	IRS2	IRS 3
AVERAGE DRIFT	- 00.3 NM/H	00.4 NM/H	00.3 NM/H
RESIDUAL GND SPD	- 01.0 KTS	03.0 KTS	1.0 KTS

EXAMPLE

R

FM POSTFLIGHT REPORT

DATE : 24 OCT 06
TIME : 12 : 05

A/C TYPE	: A330-300	DATABASE	: AB49402001
ENG TYPE	: CF6-80E1A2	CYCLE	: 29 SEP-26 OCT
FLT NUMBER	: AIB 105	FROM/TO	: EINN/LFBO
CO RTE	:	ALTN	: LFBP
ALTN CO RTE	:		
PERF FACTOR	: +1.5	COST INDEX	: 90
IDLE FACTOR	: +0.0		

FLIGHT PLAN DATA

	DIST	TIME	CRZ FL		
DEST-LFBO	: —	11:52	FL—		
ALTN/——	: —	—:—	FL—		
DEP RWY	: 06		ARV PRC	: AGN2T	
DEP PRC	:		APR PRC	: VOR32L	
			ARV RWY	: 32L	

WPT	TIME	SPD/ALT	FOB	T. WIND	TAS	SAT	CRS	DIST
HISTORY VALUES								
EINN06	10:17	134/44	17.0	043/005	-	+11	053	0
1550	10:18	163/1536	16.9	235'/019	165	+08	050	2
SHA	10:18	161/1691	16.9	236'/019	163	+08	049	0
ABCRK	10:27	305/FL280	15.1	295'/049	459	-41	149	53
TIVLI	10:33	.80/FL330	14.8	298'/057	448	-64	143	46
LND	10:44	.84/FL330	14.1	320'/034	477	-61	129	111
ABLIZAD	10:51	.84/FL330	13.6	326'/034	474	-61	141	47
ABBERAT	10:58	.84/FL330	12.4	313'/029	480	-59	141	21
ABOIN	11:03	.84/FL330	12.2	326'/030	479	-60	142	44
ABNTS	11:13	.85/FL330	12.0	330'/034	481	-60	142	126
ABVENAR	11:21	.84/FL330	10.2	335'/028	479	-60	143	24
CGC	11:25	.84/FL330	9.7	339'/031	476	-61	150	33
VELIN	11:31	.84/FL330	9.2	352'/028	476	-60	154	45
AGN	11:40	312/FL220	8.6	050'/024	429	-26	149	72
SOTAK	11:40	321/FL190	8.3	052'/025	425	-20	141	5
D191K	11:44	253/FL90	8.1	347'/015	288	+00	137	24
D165R	11:46	253/4360	7.6	309'/014	265	+04	103	11
CD32L	11:49	175/2967	6.9	293'/009	180	+05	322	5
FD32L	11:50	132/1609	6.2	308'007	132	+08	323	4
LFB032L	11:52	132/674	6.2	326'/006	131	+11	321	3

FUEL AND TIME SUMMARY

START UP		SHUT DOWN	
FUEL : 17.0		FUEL	: 6.2
WEIGHT : 75.8		WEIGHT	: 65.0
TIME :10.09		TIME	: 12:01
TO TIME : —.-		LDG TIME	: 11:52

IRS DATA AT : LFB032L

	IRS 1	IRS2	IRS 3
AVERAGE DRIFT	- 00.3NM/H	00.4 NM/H	00.3 NM/H
RESIDUAL GND SPD	- 01.0 KTS	03.0 KTS	01.0 KTS

05.00 CONTENTS

05.05 INTRODUCTION

05.10 COCKPIT PREPARATION

FMGS INITIALIZATION 1
FLIGHT PLAN INITIALIZATION 3
– LATERAL F-PLN 5
– VERTICAL F-PLN 7
FMGS DATA INSERTION 16

05.15 BEFORE PUSH BACK OR START

CHANGE OF RUNWAY 1
TAKEOFF FROM INTERSECTION 2

05.20 TAXI

FCU SELECTION FOR TAKEOFF 1
FMA MODE CHECK 1
SELECTING A NAVIGATION DISPLAY 2
SELECTING TAKEOFF DISPLAYS FOR PILOT'S AND COPILOT'S MCDU . . . 2

05.30 TAKEOFF

MONITORING THE TAKEOFF 1
PRESELECTING A HDG OR A TRK 3
NORMAL TAKEOFF PROFILE 4
NO FLIGHT DIRECTOR TAKEOFF 5
TAKEOFF WITH NO V2 ENTRY 6
TAKEOFF USING THE LOCALIZER OF THE OPPOSITE RUNWAY 7

05.40 CLIMB

MONITORING THE CLIMB PHASE 1
EXPEDITE CLIMB ◁ 7
IMMEDIATE RETURN TO ORIGIN AIRPORT 8

05.50 CRUISE

REACHING CRUISE FLIGHT LEVEL 1
MONITORING THE NAVIGATION ACCURACY 2
MONITORING THE PREDICTIONS 4
R ENTERING A STEP CLIMB OR A STEP DESCENT 5
IMMEDIATE CHANGE OF LEVEL IN CRUISE 7
PREPARATION FOR DESCENT AND APPROACH 8

05.60 DESCENT

DESCENT INITIATION 1
DESCENT MONITORING 1
EXPEDITE DESCENT ◁ 7
MONITORING THE NAVIGATION IN THE TERMINAL CONTROL AREA . . . 8
TOO STEEP PATH 8
HOLDING PATTERN 9
MANUAL TERMINATION 10

05.70 APPROACH

INITIAL APPROACH 1
ILS APPROACH 3
STANDARD ILS AUTOMATIC APPROACH 6
SWITCHING FROM NON ILS TO ILS APPROACH 9
TASK SHARING DURING CAT I, CAT II, CAT III, APPROACH AND LANDING . 10
R TASK SHARING DURING CAT I APPROACH (or better) 11
R TASK SHARING DURING CAT II APPROACH 12
TASK SHARING DURING CAT III APPROACH WITH DH. 13
TASK SHARING FOR CAT III APPROACH/LANDING WITHOUT DH 13A
LANDING CATEGORIES 14
WARNINGS FOR ILS APPROACH 15
FAILURES AND ASSOCIATED ACTIONS ABOVE 1000 FT FOR CAT II/III . . 16
R FAILURES AND ASSOCIATED ACTIONS BELOW 1000 FT FOR CAT II. . . . 17
R FAILURES AND ASSOCIATED ACTIONS BELOW 1000 FT DURING
R A CAT III APPROACH WITH DH. 18
R FAILURES AND ASSOCIATED ACTIONS BELOW 1000 FT DURING
R A CAT III APPROACH WITHOUT DH. 19
BACK COURSE LOCALIZER APPROACH 20
NON PRECISION APPROACH 21
CIRCLING APPROACH 29
VISUAL APPROACH 29

05.80 GO-AROUND

MONITORING THE GO-AROUND 1
GO-AROUND FROM AN INTERMEDIATE APPROACH ALTITUDE 1A
GO-AROUND PROFILE 2
– WITH FD ON 2
– WITHOUT FD 3
MISSED APPROACH : TRY AGAIN 4
MISSED APPROACH : DIVERT 4
TASK SHARING DURING A GO-AROUND 5

05.00 CONTENTS

05.05 INTRODUCTION

05.10 COCKPIT PREPARATION

FMGS INITIALIZATION 1
FLIGHT PLAN INITIALIZATION 3
– LATERAL F-PLN 5
– VERTICAL F-PLN 7
FMGS DATA INSERTION 16

05.15 BEFORE PUSH BACK OR START

CHANGE OF RUNWAY 1
TAKEOFF FROM INTERSECTION 2

05.20 TAXI

FCU SELECTION FOR TAKEOFF 1
FMA MODE CHECK 1
SELECTING A NAVIGATION DISPLAY 2
SELECTING TAKEOFF DISPLAYS FOR PILOT'S AND COPILOT'S MCDU . . . 2

05.30 TAKEOFF

MONITORING THE TAKEOFF 1
PRESELECTING A HDG OR A TRK 3
NORMAL TAKEOFF PROFILE 4
NO FLIGHT DIRECTOR TAKEOFF 5
TAKEOFF WITH NO V2 ENTRY 6
TAKEOFF USING THE LOCALIZER OF THE OPPOSITE RUNWAY 7

05.40 CLIMB

MONITORING THE CLIMB PHASE 1
EXPEDITE CLIMB ◁ 7
IMMEDIATE RETURN TO ORIGIN AIRPORT 8

05.50 CRUISE

REACHING CRUISE FLIGHT LEVEL 1
MONITORING THE NAVIGATION ACCURACY 2
MONITORING THE PREDICTIONS 4
R ENTERING A STEP CLIMB OR A STEP DESCENT 5
IMMEDIATE CHANGE OF LEVEL IN CRUISE 7
PREPARATION FOR DESCENT AND APPROACH 8

05.60 DESCENT

DESCENT INITIATION 1
DESCENT MONITORING 1
EXPEDITE DESCENT ◁ 7
MONITORING THE NAVIGATION IN THE TERMINAL CONTROL AREA 8
TOO STEEP PATH 8
HOLDING PATTERN 9
MANUAL TERMINATION 10

05.70 APPROACH

INITIAL APPROACH 1
ILS APPROACH 3
STANDARD ILS AUTOMATIC APPROACH 6
SWITCHING FROM NON ILS TO ILS APPROACH 9
TASK SHARING DURING CAT I, CAT II, CAT III, APPROACH AND LANDING . 10
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R FAILURES AND ASSOCIATED ACTIONS BELOW 1000 FT DURING
R A CAT III APPROACH WITH DH. 18
R FAILURES AND ASSOCIATED ACTIONS BELOW 1000 FT DURING
R A CAT III APPROACH WITHOUT DH. 19
BACK COURSE LOCALIZER APPROACH 20
NON PRECISION APPROACH 21
CIRCLING APPROACH 29
VISUAL APPROACH 29

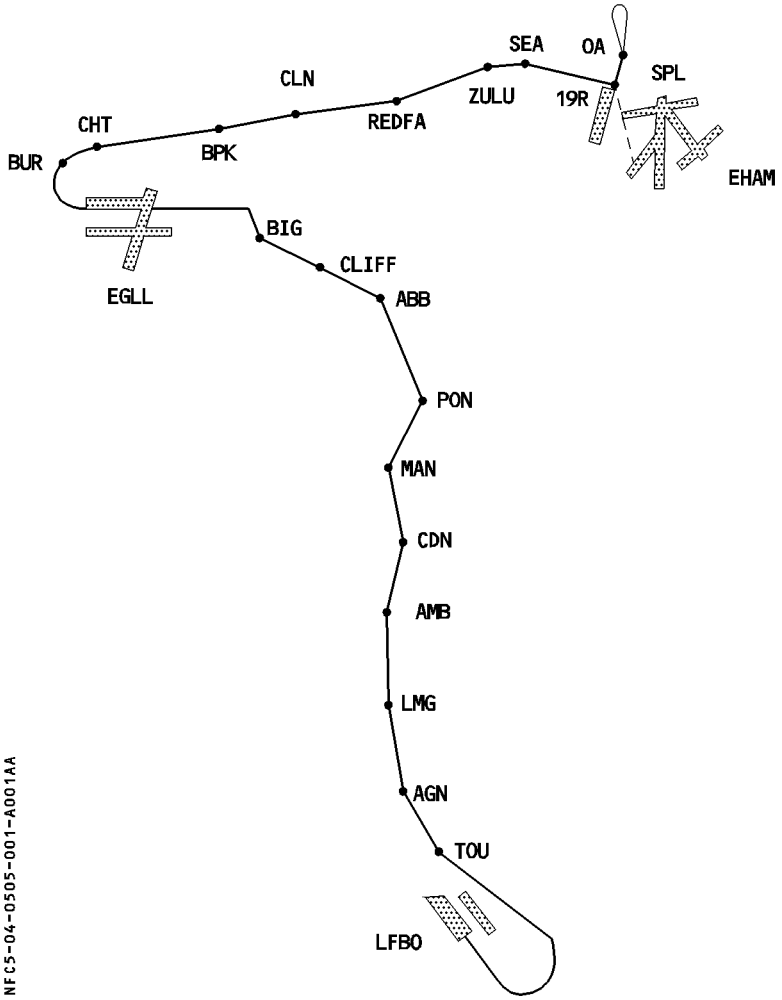
05.80 GO AROUND

MONITORING THE GO-AROUND 1
GO-AROUND FROM AN INTERMEDIATE APPROACH ALTITUDE 1A
GO-AROUND PROFILE 2
MISSED APPROACH : TRY AGAIN 4
MISSED APPROACH : DIVERT 4
TASK SHARING DURING A GO-AROUND 5

INTRODUCTION

Note : This chapter is an amplification of the SOP. Anytime it was feasible, the same chapters and the same titles of paragraph were retained.

The following discussion of the FMGS uses this flight plan as an example.

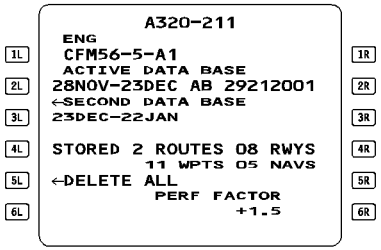


FMGS INITIALIZATION

CHECKING THE CLOCK DATE

– **CHECK the CLOCK DATE and ADJUST if necessary.**
If the date in the active database does not match the clock date, the MCDU displays "CHECK DATA BASE CYCLE". If this message appears, check the period of validity in the second database and select it, if required.

NFCS-04-0510-001-A001AA



CAUTION

Cycling the database deletes the active and secondary flight plans. Do not cycle it while airborne because doing so will delete the flight plan, eliminate all speed predictions, and blank the ND. If the aircraft is in managed speed, Green Dot becomes the speed target.

CHECKING stored WAYPOINTS, NAVAIDS, RUNWAYS, or ROUTES

– **PRESS the DATA key.**

– **SELECT, successively, as required :**
· STORED WAYPOINT
· STORED NAVAIDS
· STORED RUNWAYS
· STORED ROUTES

– **CHECK the contents of each of these data storages and DELETE items, as appropriate.**

NAVAIDS DESELECTION

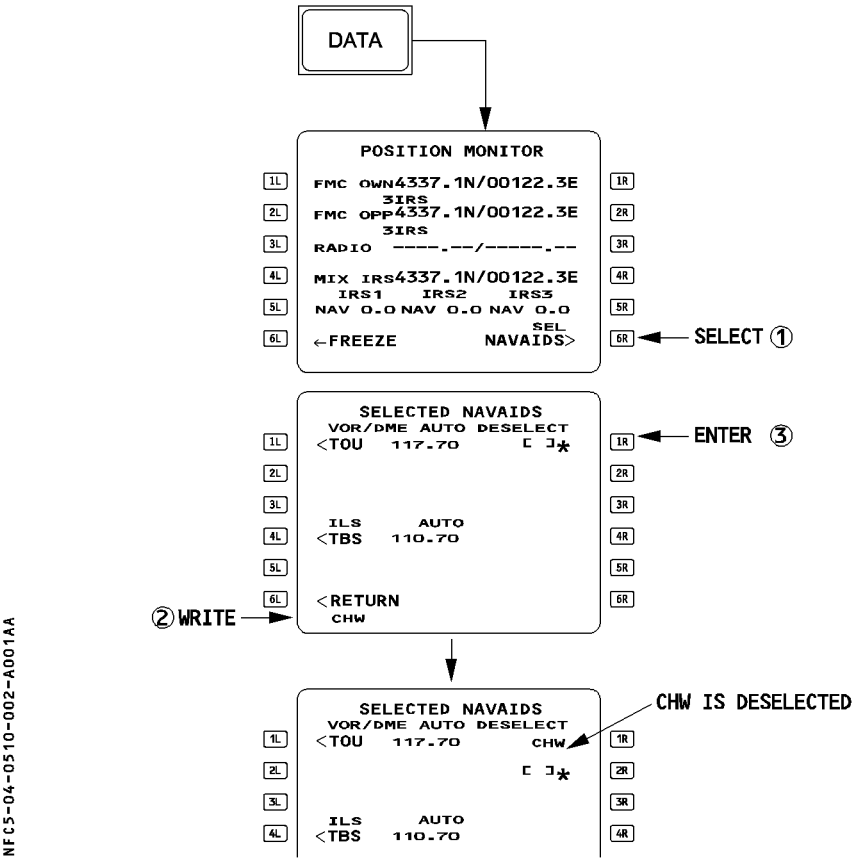
If NOTAMS indicate that selected navaids are unreliable or unserviceable, deselect them as follows :

– PRESS the DATA key

– SELECT the POSITION MONITOR page

– SELECT the SELECTED NAVAIDS page

– Under "DESELECT", INSERT the navaid identifier into the brackets.
The pilot can make only six deselections.

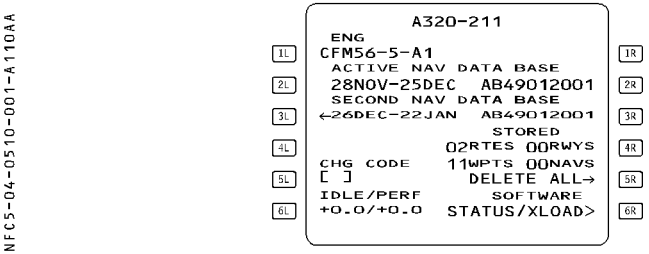


FMGS INITIALIZATION

CHECKING THE CLOCK DATE

– **CHECK the CLOCK DATE and ADJUST, if necessary.**
If the date in the active database does not match the clock date, the MCDU displays "CHECK DATA BASE CYCLE". If this message appears, check the period of validity in the second database and select it, if required.

R



NFC5-04-0510-001-A110AA

CAUTION

Cycling the navigation database deletes the active and secondary flight plans. Do not cycle it while airborne because doing so will delete the flight plan, eliminate all speed predictions, and blank the ND. If the aircraft is in managed speed, Green Dot becomes the speed target.

CHECKING stored WAYPOINTS, NAVAIDS, RUNWAYS, or ROUTES

– **PRESS the DATA key.**

– **PRESS the next page key.**

– **SELECT, successively, as required :**
· STORED WAYPOINT
· STORED NAVAIDS
· STORED RUNWAYS
· STORED ROUTES

– **CHECK the contents of each of these data storages and DELETE items, as appropriate.**

NAVAIDS DESELECTION

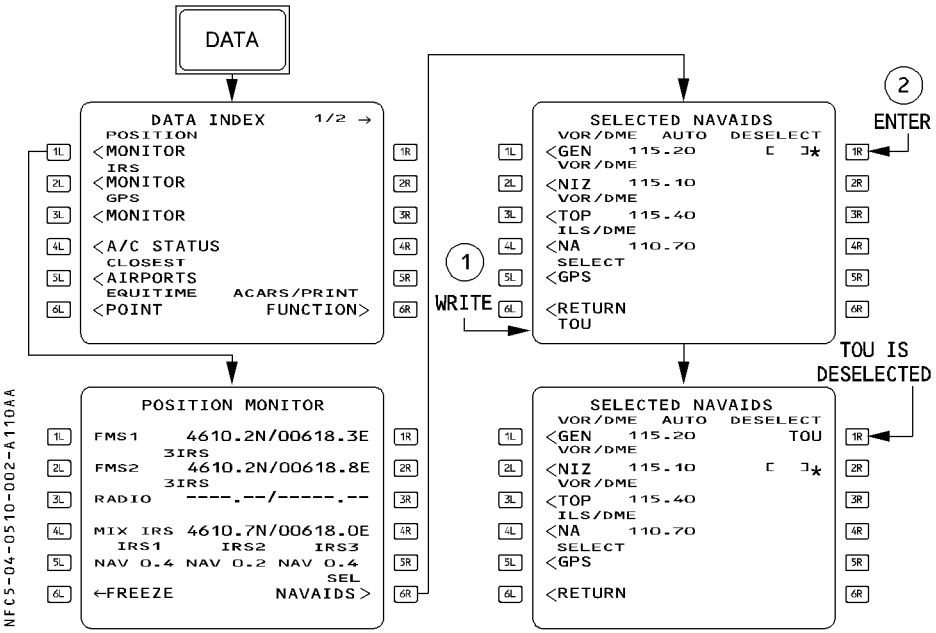
If NOTAMS indicate that selected navaids are unreliable or unserviceable, deselect them as follows :

– PRESS the DATA key.

– SELECT the POSITION MONITOR page.

– SELECT the SELECTED NAVAIDS page.

– Under "DESELECT", INSERT the navaid identifier in the brackets.
The pilot can only make six deselections.

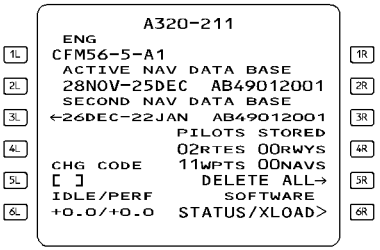


FMGS INITIALIZATION

CHECKING THE DATABASE CYCLE

– **CHECK the CLOCK DATE and ADJUST, if necessary.**
If the date in the active database does not match the clock date, the MCDU displays "CHECK DATA BASE CYCLE". If this message appears, check the period of validity in the second database and select it, if required.

NFCS-04-0510-001-A120AA



CAUTION

Cycling the navigation database deletes the active and secondary flight plans. Do not cycle it while airborne because doing so will delete the flight plan, eliminate all speed predictions, and blank the ND. If the aircraft is in managed speed, Green Dot becomes the speed target.

CHECKING pilots' WAYPOINTS, NAVAIDS, RUNWAYS, or ROUTES

– **PRESS the DATA key.**

– **PRESS the next page key.**

– **SELECT, successively, as required :**
· PILOTS WAYPOINTS
· PILOTS NAVAIDS
· PILOTS RUNWAYS
· PILOTS ROUTES

– **CHECK the contents of each of these data storages and DELETE items, as appropriate.**

NAVAIDS DESELECTION

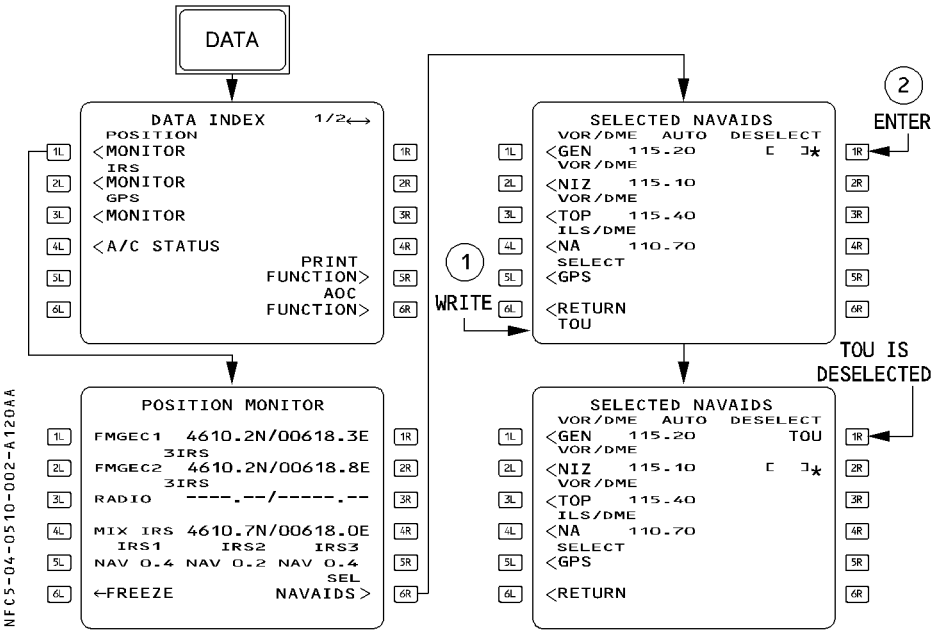
If NOTAMS indicate that selected navaids are unreliable or unserviceable, deselect them as follows :

– PRESS the DATA key.

– SELECT the POSITION MONITOR page.

– SELECT the SELECTED NAVAIDS page.

– Under "DESELECT", INSERT the navaid identifier in the brackets.
The pilot can only make six deselections.

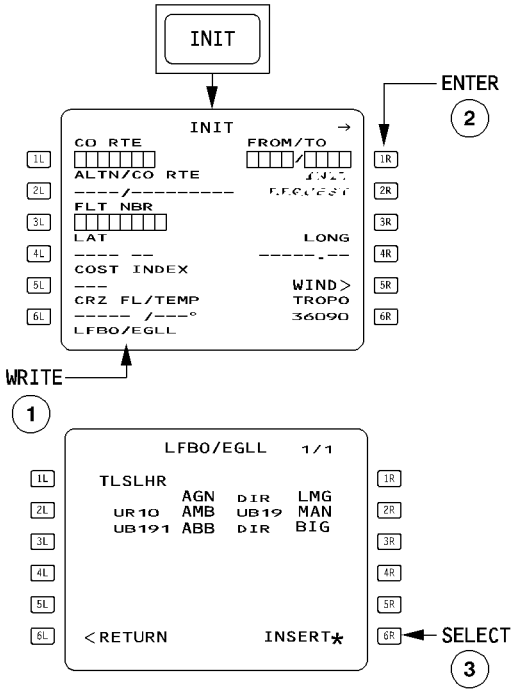


Note : When a navaid is deselected, it is no more used for navigation by the FMGC during the rest of the flight. However a deselected navaid can still be manually tuned on the RAD NAV page and displayed on ND.

FLIGHT PLAN INITIALIZATION

– Follow SOP instructions, when the route is a company route stored in the database.

● **If the company route is unknown, proceed as follows :**



NFCS-04-0510-003-A001AA

– **WRITE a "FROM/TO" city pair, then ENTER it :**
If one or more company routes run between the cities, the ROUTE SELECTION page appears and defines them.

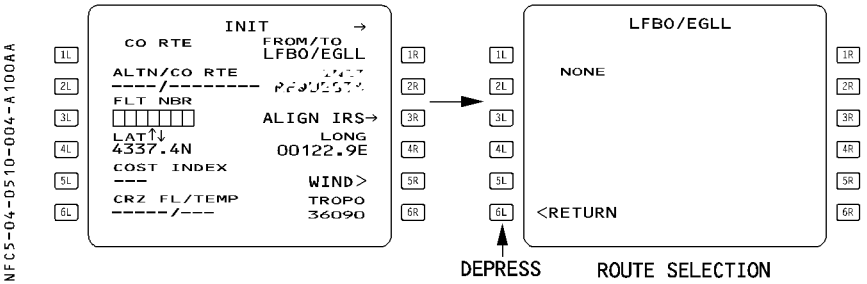
– **INSERT the preferred company route.**

- **If the database does not contain a company route :**
  The flight plan must be constructed manually :

  – **PRESS the INIT key**

  – **ENTER a city pair in the FROM/TO field.**
  The ROUTE SELECTION page comes up with "NONE"

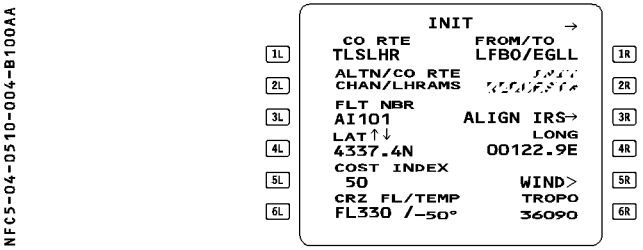
  – **SELECT RETURN [6L] key then construct the flight plan manually.**



If waypoints, navaids or airports are not in the nav database, the pilot must define and store them manually, using the "data stored" function.

ALIGNING IRS

· The pilot can enter latitude with N or S preceding or following the value (for example, N4350.5 or 4350.5N), and longitude with E or W preceding or following the value (for example, E00364.5 or 364.5E, W11020.3 or 11020.3W).
Leading zeros may be omitted.



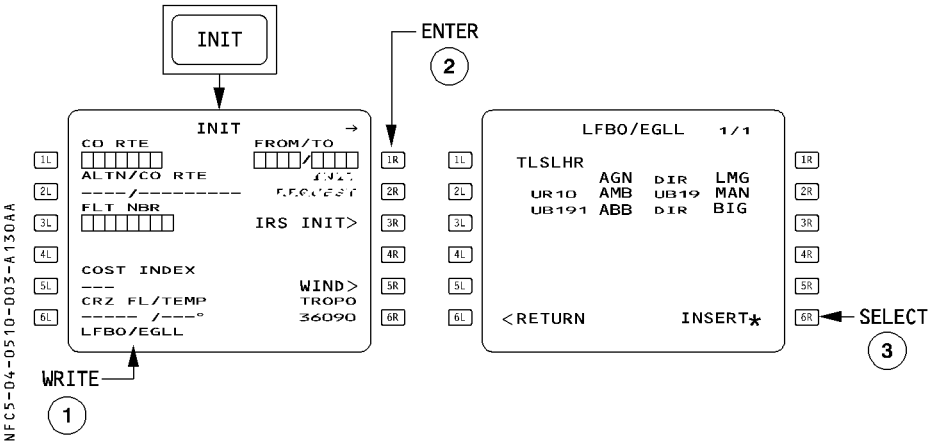
· If the airport reference point is modified after the completion of the alignment, the MCDU displays the message "RESET IRS TO NAV". During stop over, it should be considered as a reminder for a quick realignment.

FLIGHT PLAN INITIALIZATION

– Follow SOP instructions, when the route is a company route stored in the database.

– check COST INDEX.

● **If the company route is unknown, proceed as follows :**



– WRITE a "FROM/TO" city pair, then ENTER it :
If one or more company routes run between the cities, the ROUTE SELECTION page appears and defines them.

– INSERT the preferred company route.

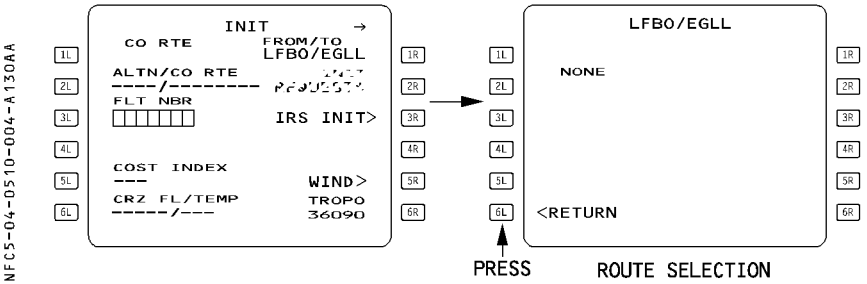
– check COST INDEX.

- **If the database does not contain a company route :**
  The flight plan must be constructed manually :

  – PRESS the INIT key

  – ENTER a city pair in the FROM/TO field.
  The ROUTE SELECTION page comes up with "NONE"

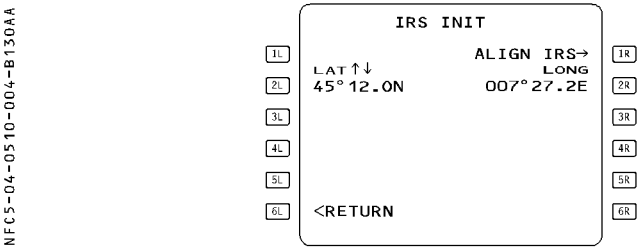
  – SELECT RETURN [6L] key then construct the flight plan manually.



If waypoints, navaids or airports are not in the nav database, the crew must define and store them manually, using the "data stored" function.

ALIGNING IRS

· The crew can enter latitude with N or S preceding or following the value (for example, N4350.5 or 4350.5N), and longitude with E or W preceding or following the value (for example, E00364.5 or 364.5E, W11020.3 or 11020.3W).
Leading zeros may be omitted.

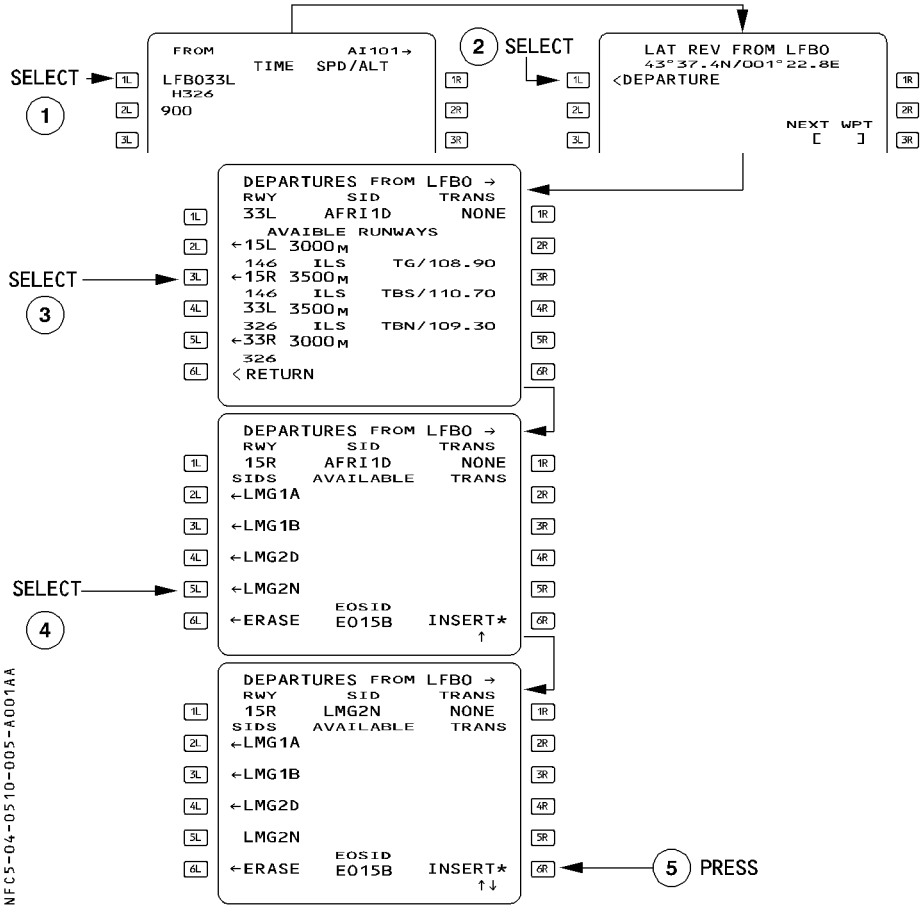


· If the airport reference point is modified after the completion of the alignment, the MCDU displays the message "RESET IRS TO NAV". During stop over, it should be considered as a reminder for a quick realignment.

- **If the "RESET IRS TO NAV" message comes up later :**
  - Check the latitude and longitude shown on the INIT A page against the position of the IRSs in NAV MODE on the Inertial System Display Unit (overhead panel).
  - If these positions differ, RESET the ADIRS CDU mode by switching the selector switches OFF and back to NAV within five seconds. (All three IRSs must be switched OFF and then all three switched to NAV.)

LATERAL FLIGHT PLAN

SELECTING A DEPARTURE



You may use the [NEXT PAGE] key to gain access to the listings of runways, SIDs, and transitions.

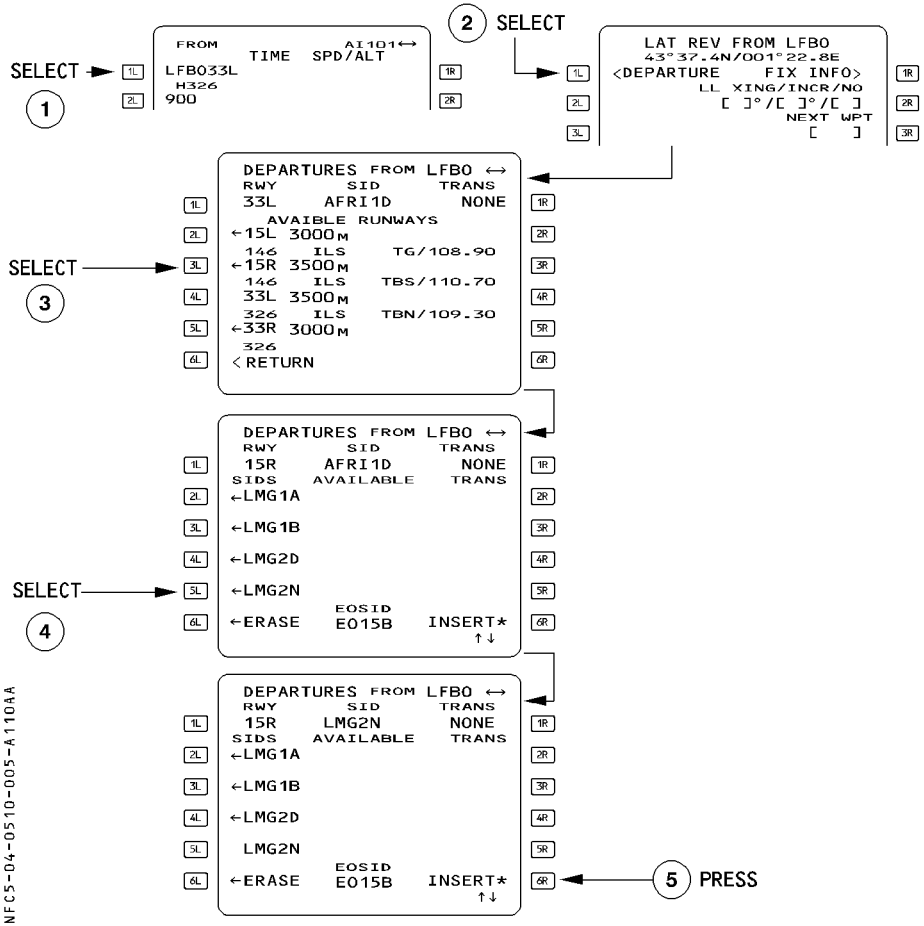
Procedure

- **PRESS the F-PLN key on MCDU**
- **SELECT the DEPARTURE prompt [1L] key**
- **SELECT the RWY in USE, SID and TRANS**
- **CHECK the resulting temporary F-PLN**
- **If it is correct, INSERT it using [6R] key.**
- **If it is not correct, ERASE it using [6L] key.**

- **If the "RESET IRS TO NAV" message comes up later :**
  - Check the latitude and longitude shown on the INIT A page against the position of the IRSs in NAV MODE on the IRS pages (accessed through the IRS MONITOR page).
  - If these positions differ, RESET the ADIRS CDU mode by switching the selector switches OFF and back to NAV within five seconds. (All three IRSs must be switched OFF, and then all three switched to NAV.)

LATERAL FLIGHT PLAN

SELECTING A DEPARTURE



R You may use the "NEXT PAGE" key ◁, or the "←" or "→" keys, to gain access to the listings of runways, SIDs, and transitions.

Procedure

– **PRESS the F-PLN key on MCDU**

– **SELECT the DEPARTURE prompt [1L] key**

– **SELECT the RWY in USE, SID and TRANS**

– **CHECK the resulting temporary F-PLN**

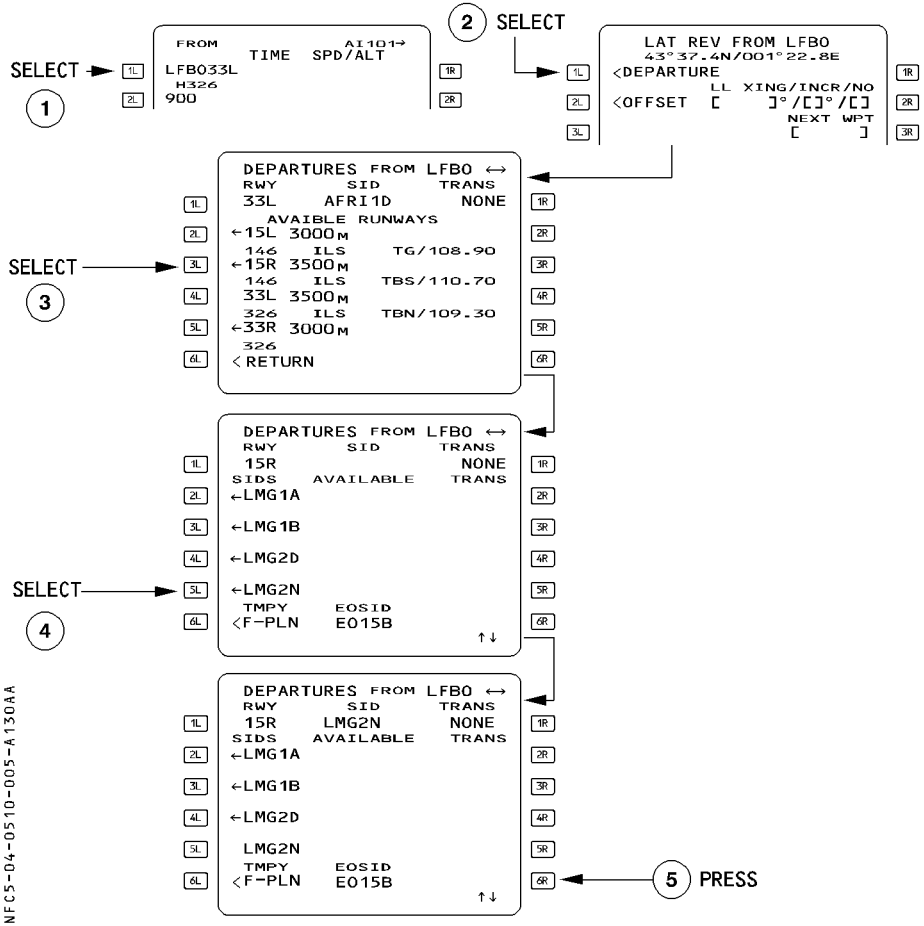
– **If it is correct, INSERT it using [6R] key.**

– **If it is not correct, ERASE it using [6L] key.**

- **If the "RESET IRS TO NAV" message comes up later :**
  - Check the latitude and longitude shown on the INIT A page against the position of the IRSs in NAV MODE on the IRS pages (accessed through the IRS MONITORS page).
  - If these positions differ, RESET the ADIRS CDU mode by switching the selector switches OFF and back to NAV within five seconds. (All three IRSs must be switched OFF, and then all three switched to NAV.)

LATERAL FLIGHT PLAN

SELECTING A DEPARTURE



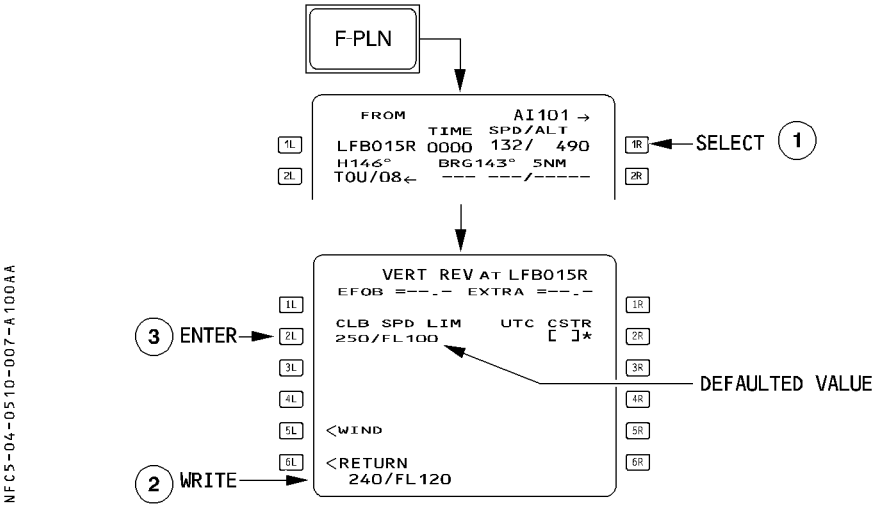
You may use the "←" or "→" keys to gain access to the listings of runways, SIDs, and transitions.

Procedure

- **PRESS the F-PLN key on MCDU**
- **SELECT the DEPARTURE prompt [1L] key**
- **SELECT the RWY in USE, SID and TRANS**
- **CHECK the resulting temporary F-PLN**
- **If it is correct, INSERT it using [6R] key.**
- **If it is not correct, ERASE it using [6L] key.**

VERTICAL FLIGHT PLAN

– ENTERING/MODIFYING A SPEED LIMIT



– PRESS the F-PLN key on MCDU

– SELECT the VERTICAL REVISION at FROM waypoint

– WRITE a new speed limit/altitude and ENTER.

The pilot can insert one climb speed limit and one descent speed limit into the vertical flight plan, or modify or clear the limits that are already in it.

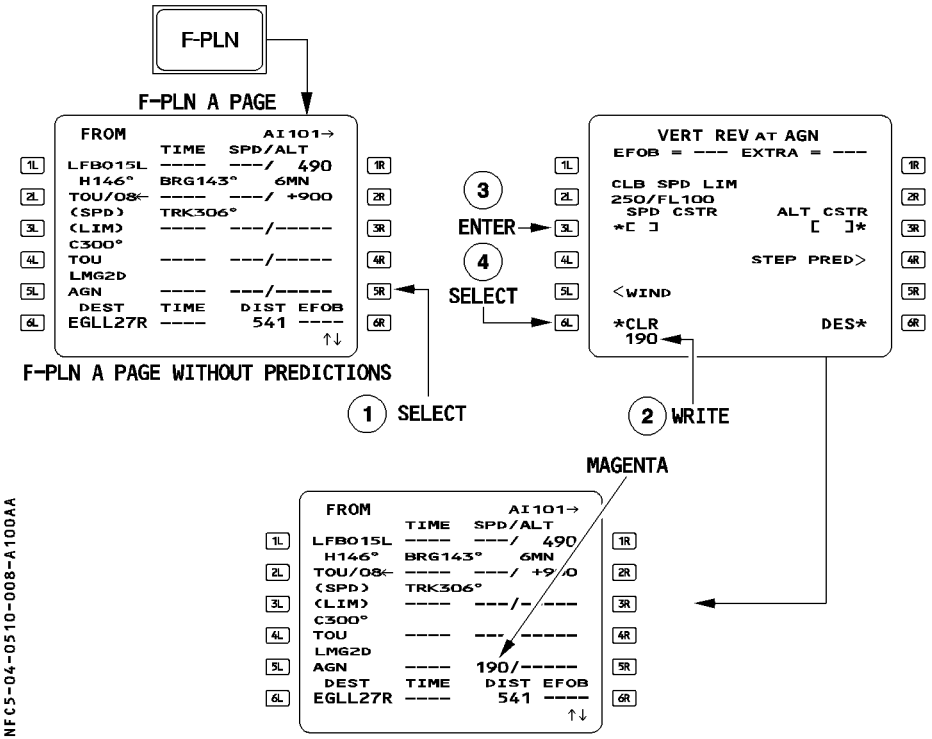
The speed limit is defined by a speed and an altitude (for example, 230/9000), which means that the managed speed target will be limited by the speed limit when the aircraft flies below the specified altitude.

250 knots at 10,000 feet is the default speed limit in the vertical flight plan in both climb and descent. The vertical revision page presents the climb speed (CLB SPD) limit if the revised waypoint belongs to a SID or is between departure and top of climb.

The vertical revision page shows the descent speed (DES SPD) limit if the revised waypoint belongs to a standard terminal arrival route (STAR) or is between top of descent and destination.

It can be deleted by a clear action, field reverts to brackets. It can also be cleared directly on the F-PLN A page by clearing the SPD LIM pseudo waypoint.

ENTERING A SPEED CONSTRAINT

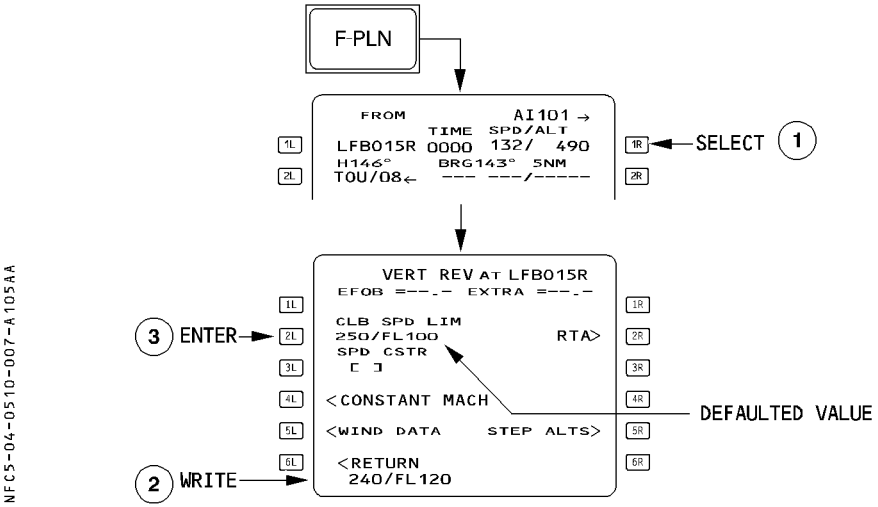


Procedure

- **PRESS the F-PLN key on MCDU**
- **SELECT the VERT REV page at revised waypoint**
- **WRITE the speed constraint value into the scratchpad and ENTER it in 3L.**
- **INSERT the constraint using the appropriate *CLB or DES* prompt when displayed. If CLB and DES are not displayed, insertion occurs when the value is entered in 3L.** The system displays the climb (CLB) or the descent (DES) prompt at [6L] or [6R] when the predictions are not yet available or when the waypoint is part of the cruise phase as originally defined.

VERTICAL FLIGHT PLAN

– ENTERING/MODIFYING A SPEED LIMIT



– **PRESS the F-PLN key on the MCDU.**

– **SELECT VERT REV at the FROM waypoint.**

– **WRITE a new speed limit/altitude and enter it**

– **CHECK and INSERT the temporary flight plan.**

The crew can insert one climb speed limit and one descent speed limit into the vertical flight plan, or modify or clear the limits that are already in it.

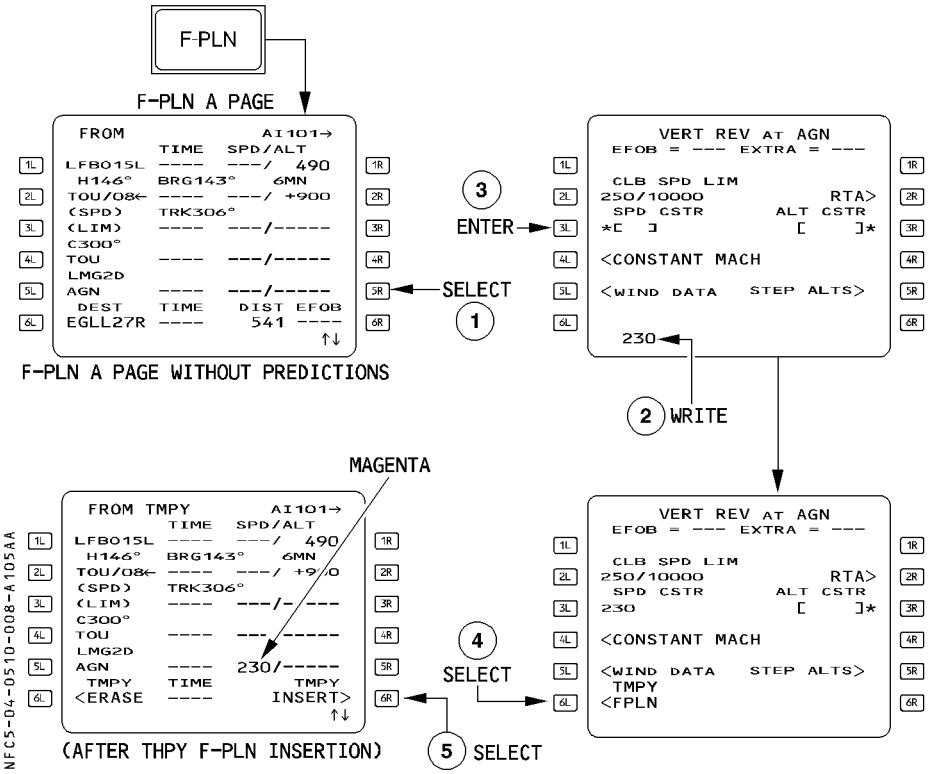
The speed limit is defined by a speed and an altitude (for example, 230/9000), which means that the managed speed target will be limited by the speed limit when the aircraft flies below the specified altitude.

In both climb and descent, 250 knots at 10,000 feet is the default speed limit in the vertical flight plan. The vertical revision page presents the climb speed (CLB SPD) limit if the revised waypoint is between departure and top of descent.

The vertical revision page shows the descent speed (DES SPD) limit, if the revised waypoint is between top of descent and destination.

It can be deleted by a clear action, the field reverts to brackets. It can also be cleared directly on the F-PLN A page by clearing the SPD LIM pseudo-waypoint.

ENTERING A SPEED CONSTRAINT

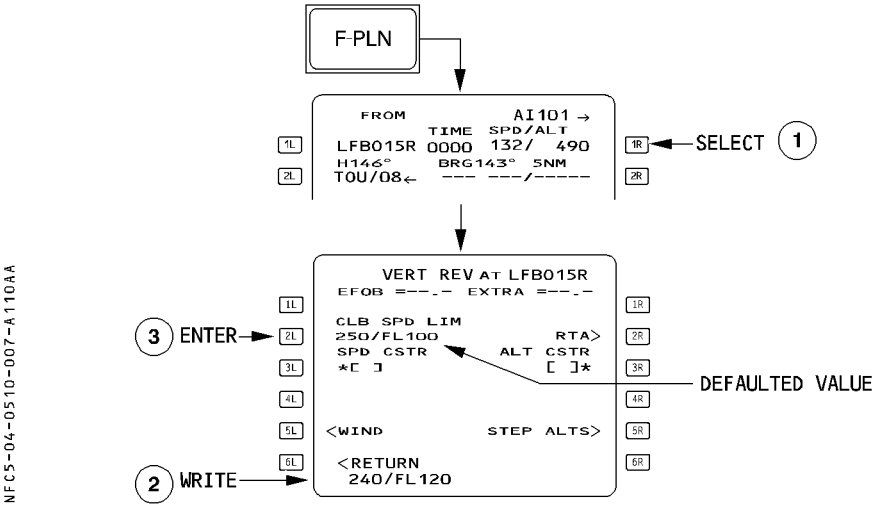


Procedure

- PRESS the F-PLN key on the MCDU.
- SELECT the VERT REV page at the revised waypoint.
- ENTER the speed constraint value in the [3L] field.
- CHECK and INSERT the temporary flight plan.

VERTICAL FLIGHT PLAN

– ENTERING/MODIFYING A SPEED LIMIT



– PRESS the F-PLN key on the MCDU.

– SELECT the VERTICAL REVISION at the FROM waypoint.

– WRITE a new speed limit/altitude and ENTER.

The pilot can insert one climb speed limit and one descent speed limit into the vertical flight plan, or modify or clear the limits that are already in it.

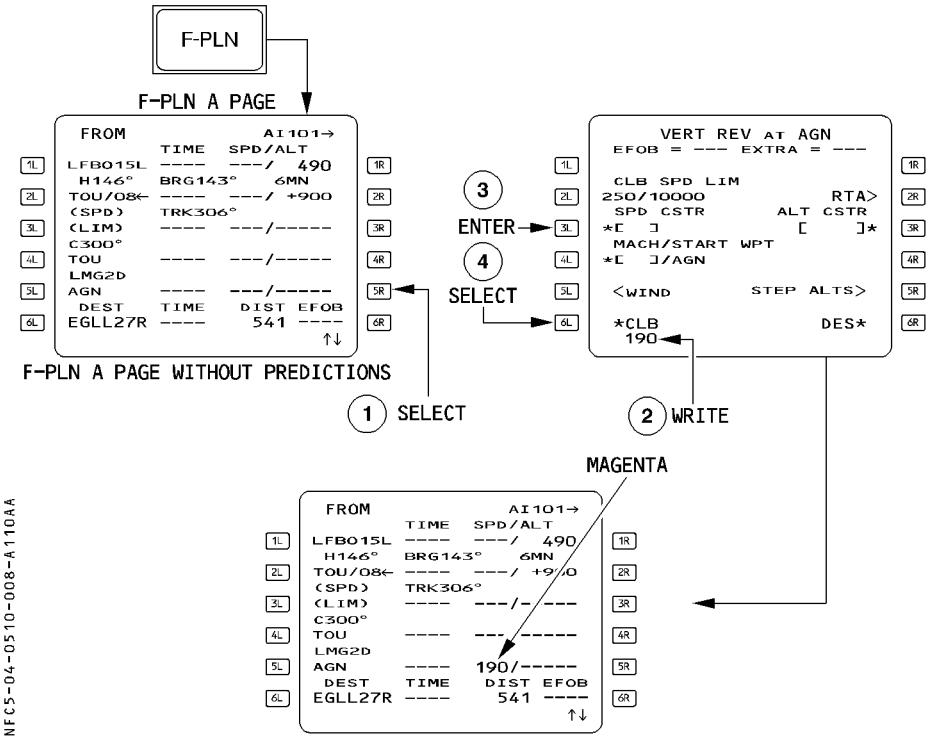
The speed limit is defined by a speed and an altitude (for example, 230/9000), which means that the managed speed target will be limited by the speed limit when the aircraft flies below the specified altitude.

In both climb and descent, 250 knots at 10,000 feet is the default speed limit in the vertical flight plan. The vertical revision page presents the climb speed (CLB SPD) limit if the revised waypoint is between departure and top of descent.

The vertical revision page shows the descent speed (DES SPD) limit if the revised waypoint is between top of descent and destination.

It can be deleted by a clear action, the field reverts to brackets. It can also be cleared directly on the F-PLN A page by clearing the SPD LIM pseudo waypoint.

ENTERING A SPEED CONSTRAINT



Procedure

– PRESS the F-PLN key on the MCDU.

R **– SELECT the VERT REV page at the revised waypoint.**

– WRITE the speed constraint value in the scratchpad, and ENTER it in [3L] key.

– INSERT the constraint using the appropriate *CLB or DES* prompt when displayed. If CLB and DES are not displayed, insertion occurs when the value is entered in 3L.
The system displays the *CLB or DES* prompt at [6L] or [6R] when the predictions are not yet available, or when the waypoint is part of the cruise phase, as originally defined.

When predictions are not yet available, the constraints are displayed on the F-PLN A page in magenta.

When predictions are available, the speed constraint is highlighted by a star (*).

* If the predicted speed matches the constraint, the star is magenta.
* If the prediction is that the aircraft will miss the speed constraint, the star is amber.
  If a speed constraint cannot be met (by more than 10 kt), the FMGS generates the message "SPD ERROR AT WPT XX".

A speed constraint may be assigned to any waypoint in the climb or the descent phase except the FROM, origin, or destination waypoints, and any pseudo waypoint.

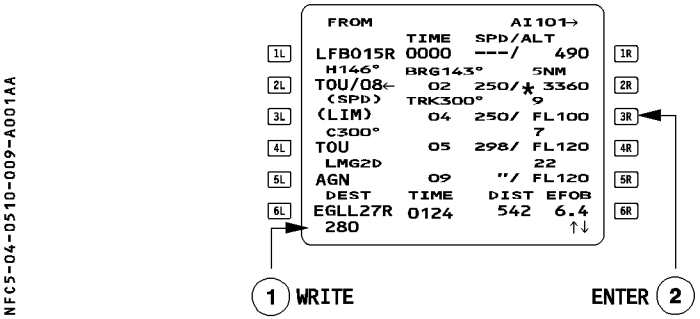
When a speed constraint is assigned to a waypoint, the constraint will limit the managed speed target as follows :

— In takeoff or climb phase until you pass the constrained waypoint.
— In descent an approach phase, after passing the constrained waypoint.

Speed constraints are observed by the FMGS when NAV mode and speed managed are active.

ENTERING A SPEED CONSTRAINT THROUGH F-PLN A PAGE

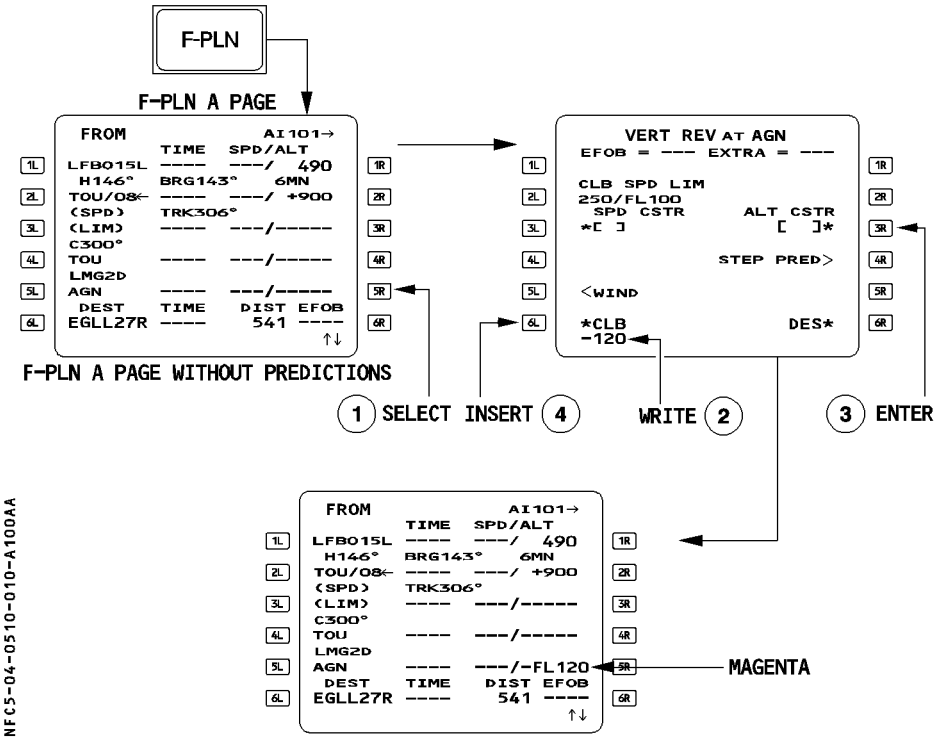
You may also enter a speed constraint through the F-PLN A page.



NFC5-04-0510-009-A001AA

Note : You may delete the constraint using the clear key on the relevant right hand key. However if there is an altitude constraint assigned at that point, the clear action deletes it too.

ENTERING AN ALTITUDE CONSTRAINT



Procedure

- **PRESS the F-PLN key on MCDU**
- **SELECT the "VERT REV" page at the revised waypoint**
- **WRITE an altitude constraint into the scratchpad and ENTER it in 3R**
- **INSERT the constraint using *CLB or DES* prompt when it is displayed. Otherwise the value is inserted when it is entered in 3L field.**
  The system displays the *CLB or DES* prompt when the predictions are not yet available or when the waypoint is part of the cruise phase as originally defined.

R *Note : In case of QFE operations, the height constraints must be converted and entered*
R *as an altitude in feet.*

When predictions are not yet available, the constraints are displayed on the F-PLN A page in magenta.

When predictions are available, the speed constraint is highlighted by a star (*).

* If the predicted speed matches the constraint, the star is magenta.
* If the prediction is that the aircraft will miss the speed constraint, the star is amber.
  If a speed constraint cannot be met (by more than 10 kt), the FMGS generates the message "SPD ERROR AT WPT XX".

A speed constraint may be assigned to any waypoint in the climb or the descent phase except the FROM, origin, or destination waypoints, and any pseudo waypoint.

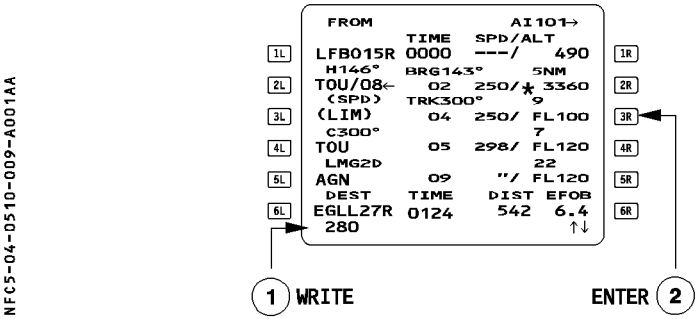
When a speed constraint is assigned to a waypoint, the constraint will limit the managed speed target as follows :

— In takeoff or climb phase until you pass the constrained waypoint.
— In descent an approach phase, after passing the constrained waypoint.

Speed constraints are observed by the FMGS when NAV mode and speed managed are active.

ENTERING A SPEED CONSTRAINT THROUGH F-PLN A PAGE

You may also enter a speed constraint through the F-PLN A page.

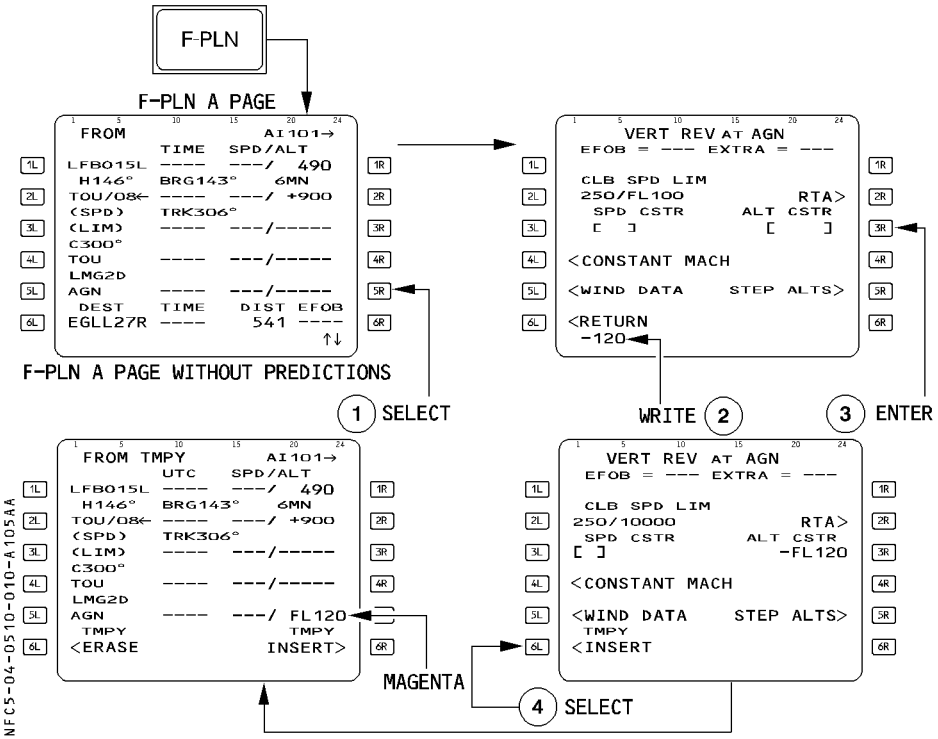


NFCS-04-0510-009-A001AA

Note : You may delete the constraint using the clear key on the relevant right hand key. However if there is an altitude constraint assigned at that point, the clear action deletes it too.

R

ENTERING AN ALTITUDE CONSTRAINT



Procedure

– **PRESS the F-PLN key on the MCDU.**

– **SELECT the "VERT REV" page at the revised waypoint.**

– **WRITE an altitude constraint in the scratchpad and ENTER it in 3R.**

– **If ← CLB and DES → prompt are displayed, SELECT the type of constraint.**
The system displays the ← CLB or DES → prompt, when the predictions are not yet available, or when the waypoint is part of the cruise phase as originally defined.

– **CHECK and INSERT the temporary flight plan.**

Note : In case of QFE operations, the altitude constraints must be converted and entered as an altitude in feet.

When predictions are not yet available, the constraints are displayed on the F-PLN A page in magenta.

When predictions are available, the speed constraint is highlighted by a star (*).

* If the predicted speed matches the constraint, the star is magenta.
* If the prediction is that the aircraft will miss the speed constraint, the star is amber.
  If a speed constraint cannot be met (by more than 10 kt), the FMGS generates the message "SPD ERROR AT WPT XX".

A speed constraint may be assigned to any waypoint in the climb or the descent phase except the FROM, origin, or destination waypoints, and any pseudo waypoint.

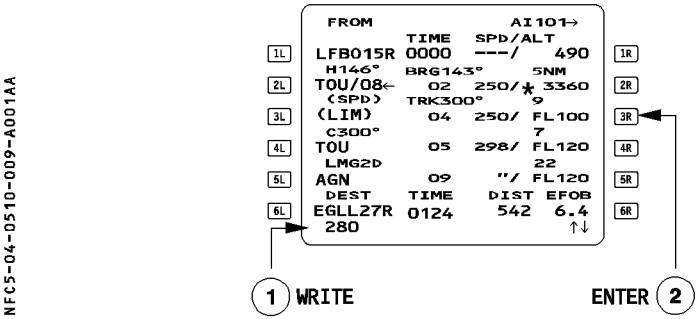
When a speed constraint is assigned to a waypoint, the constraint will limit the managed speed target as follows :

— In takeoff or climb phase until you pass the constrained waypoint.
— In descent an approach phase, after passing the constrained waypoint.

Speed constraints are observed by the FMGS when NAV mode and speed managed are active.

ENTERING A SPEED CONSTRAINT THROUGH F-PLN A PAGE

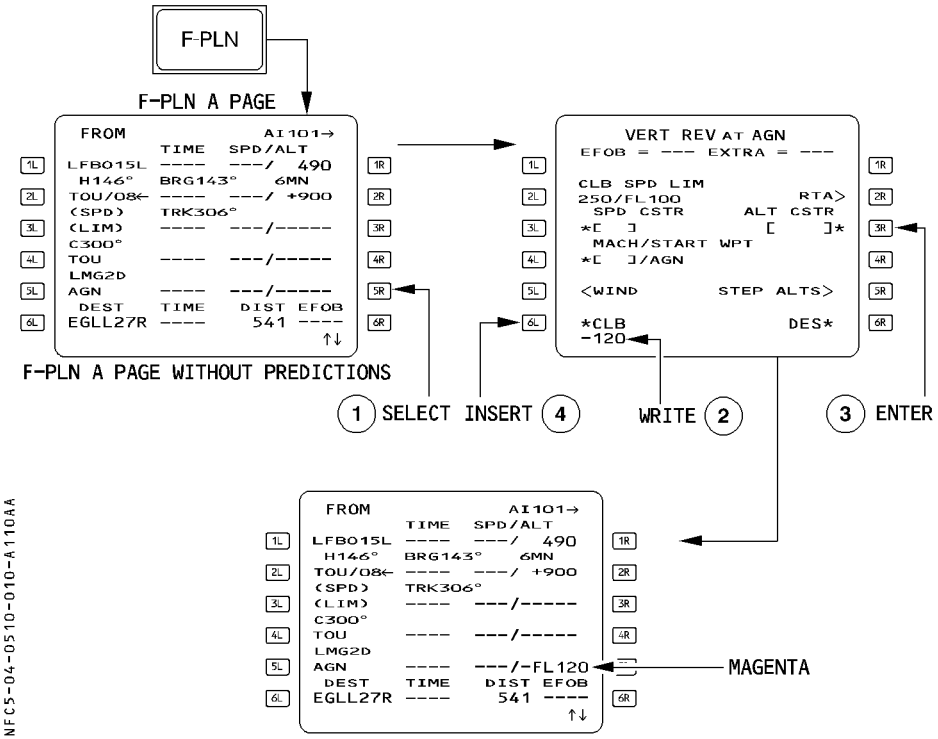
You may also enter a speed constraint through the F-PLN A page.



NFC5-04-0510-009-A001AA

Note : You may delete the constraint using the clear key on the relevant right hand key. However if there is an altitude constraint assigned at that point, the clear action deletes it too.

ENTERING AN ALTITUDE CONSTRAINT



Procedure

- **PRESS the F-PLN key on the MCDU.**
- **SELECT the "VERT REV" page at the revised waypoint.**
- **WRITE an altitude constraint in the scratchpad and ENTER it in 3R.**
- **INSERT the constraint using the *CLB or DES* prompt when it is displayed. Otherwise, the value is inserted when it is entered in 3R**
  The system displays the *CLB or DES* prompt when the predictions are not yet available or when the waypoint is part of the cruise phase as originally defined.

R *Note : In case of QFE operations, the height constraints must be converted and entered*
R *as an altitude in feet.*

You or the database may assign an altitude constraint to any waypoint in the climb or descent phases except the FROM, origin, or destination waypoints, or any pseudo waypoint.
An altitude constraint may be defined as an “at”, an “at or above”, or an “at or below” constraint. In certain procedures, the database may define an altitude constraint as a window in which the aircraft should fly.

– Enter “AT” constraints with no sign.

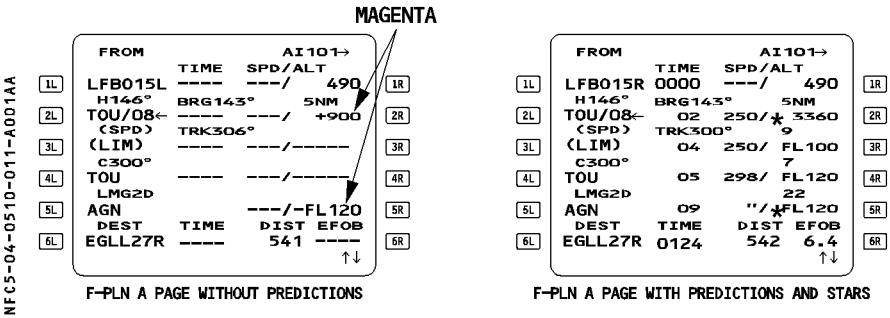
– Enter “AT or ABOVE” constraints preceded by a + sign (+FL 130, for example).

– Enter “AT or BELOW” constraints preceded by a – sign (–15000, for example).

– enter four or five-digit number when entering altitude. Include the lead zero (0500 feet, for example).
For flight level, enter a two- or three-digit number, with or without the letters “FL”. The lead zero is optional. (Examples : + FL120 or +120 ; –FL090 or –90 or –090)

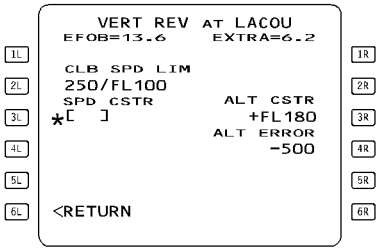
– Enter the altitude value as either altitude or flight level ; the MCDU displays the selected value as an “ALT” or “FL,” as appropriate for the transition altitude.
The constraint must be higher than the thrust reduction altitude and lower than the cruise flight level.
Once inserted in the flight plan, the altitude constraint (ALT CSTR) is displayed in magenta as long as predictions are not available.
When predictions are available, the altitude constraints are replaced by the predicted altitude at relevant waypoints highlighted by a star.

* If the predicted altitude matches the constraint the star is magenta. If the predicted altitude is missed (by more than 250 ft), the star is amber.



The vertical revision page displays "ALT ERROR", along with the difference between the constraint and the predicted altitude at the revised waypoint.

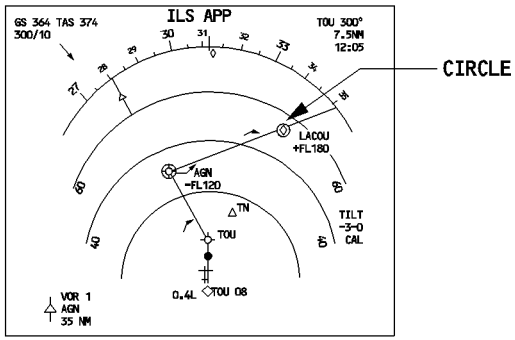
NFC5-04-0510-012-A001AA



ND display

An altitude-constrained waypoint is marked by a circle (○) on the navigation display.
This circle is white when the guidance does not take the altitude constraint into account.
It is magenta if the guidance system takes the altitude constraint into account and predicts that it will be matched.
It is amber if the guidance system takes the altitude constraint into account and predicts that it will not be matched.

NFC5-04-0510-012-B001AA



The aircraft should be at or below FL120 at AGN and above FL 180 at LACOU.

You or the database may assign an altitude constraint to any waypoint in the climb or descent phases except the FROM, origin, or destination waypoints, or any pseudo waypoint.
An altitude constraint may be defined as an “at”, an “at or above”, or an “at or below” constraint. In certain procedures, the database may define an altitude constraint as a window in which the aircraft should fly.

– Enter “AT” constraints with no sign.

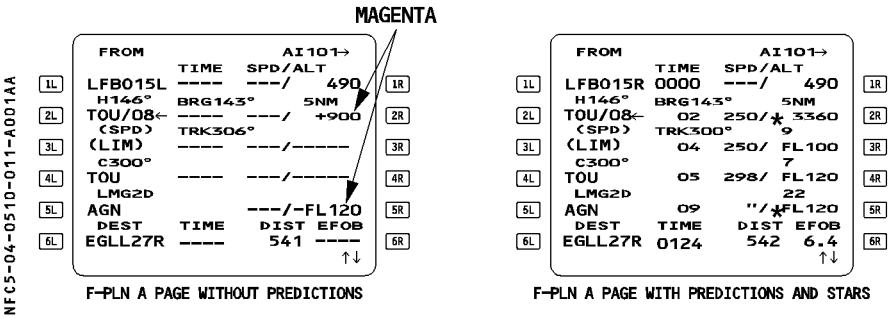
– Enter “AT or ABOVE” constraints preceded by a + sign (+FL 130, for example).

– Enter “AT or BELOW” constraints preceded by a – sign (–15000, for example).

– enter four or five-digit number when entering altitude. Include the lead zero (0500 feet, for example).
For flight level, enter a two- or three-digit number, with or without the letters “FL”. The lead zero is optional. (Examples : + FL120 or +120 ; –FL090 or –90 or –090)

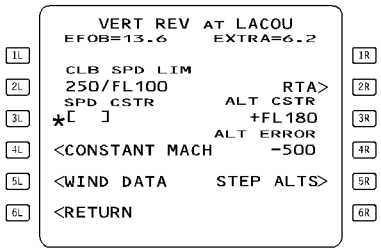
– Enter the altitude value as either altitude or flight level ; the MCDU displays the selected value as an “ALT” or “FL,” as appropriate for the transition altitude.
The constraint must be higher than the thrust reduction altitude and lower than the cruise flight level.
Once inserted in the flight plan, the altitude constraint (ALT CSTR) is displayed in magenta as long as predictions are not available.
When predictions are available, the altitude constraints are replaced by the predicted altitude at relevant waypoints highlighted by a star.

* If the predicted altitude matches the constraint the star is magenta. If the predicted altitude is missed (by more than 250 ft), the star is amber.



The vertical revision page displays "ALT ERROR", value along with the difference between the constraint and the predicted altitude at the revised waypoint.

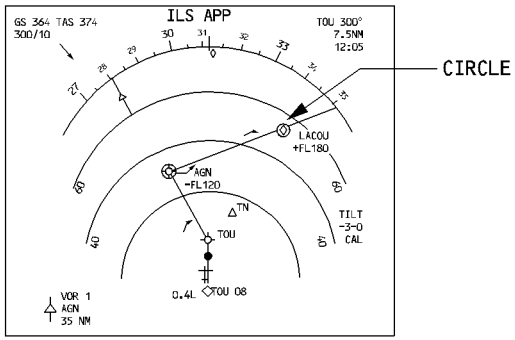
NFC5-04-0510-012-A105AA



ND display

An altitude-constrained waypoint is marked by a circle (○) on the navigation display.
This circle is white when the guidance does not take the altitude constraint into account.
It is magenta if the guidance system takes the altitude constraint into account and predicts that it will be matched.
It is amber if the guidance system takes the altitude constraint into account and predicts that it will not be matched.

NFC5-04-0510-012-B105AA



The aircraft should be at or below FL120 at AGN and above FL 180 at LACOU.

You or the database may assign an altitude constraint to any waypoint in the climb or descent phases except the FROM, origin, or destination waypoints, or any pseudo waypoint.
An altitude constraint may be defined as an “at”, an “at or above”, or an “at or below” constraint. In certain procedures, the database may define an altitude constraint as a window in which the aircraft should fly.

– Enter “AT” constraints with no sign.

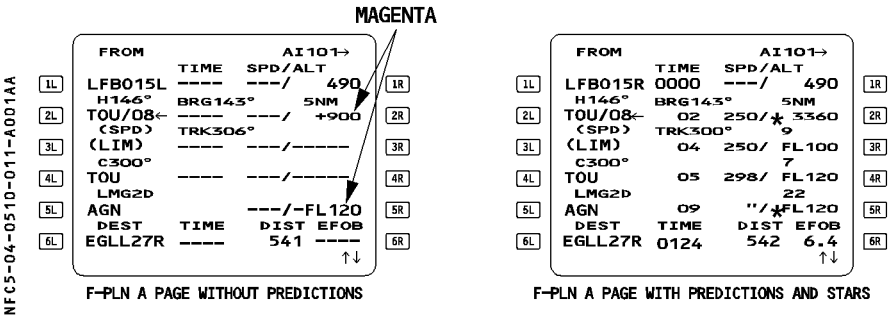
– Enter “AT or ABOVE” constraints preceded by a + sign (+FL 130, for example).

– Enter “AT or BELOW” constraints preceded by a – sign (–15000, for example).

– enter four or five-digit number when entering altitude. Include the lead zero (0500 feet, for example).
For flight level, enter a two- or three-digit number, with or without the letters “FL”. The lead zero is optional. (Examples : + FL120 or +120 ; –FL090 or –90 or –090)

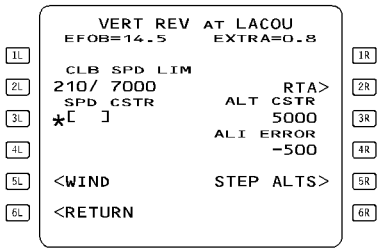
– Enter the altitude value as either altitude or flight level ; the MCDU displays the selected value as an “ALT” or “FL,” as appropriate for the transition altitude.
The constraint must be higher than the thrust reduction altitude and lower than the cruise flight level.
Once inserted in the flight plan, the altitude constraint (ALT CSTR) is displayed in magenta as long as predictions are not available.
When predictions are available, the altitude constraints are replaced by the predicted altitude at relevant waypoints highlighted by a star.

* If the predicted altitude matches the constraint the star is magenta. If the predicted altitude is missed (by more than 250 ft), the star is amber.



The vertical revision page displays "ALT ERROR", along with the difference between the constraint and the predicted altitude at the revised waypoint.

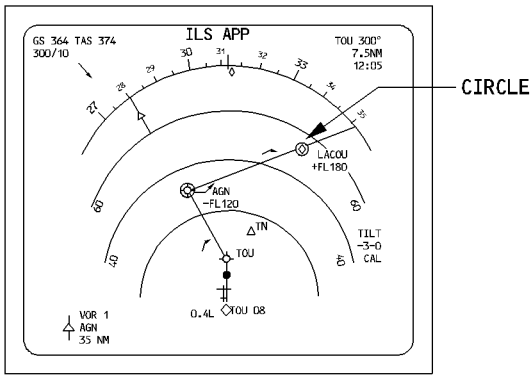
NFC5-04-0510-012-A110AA



ND display

An altitude-constrained waypoint is marked by a circle (○) on the navigation display.
This circle is white when the guidance does not take the altitude constraint into account.
It is magenta if the guidance system takes the altitude constraint into account and predicts that it will be matched.
It is amber if the guidance system takes the altitude constraint into account and predicts that it will not be matched.

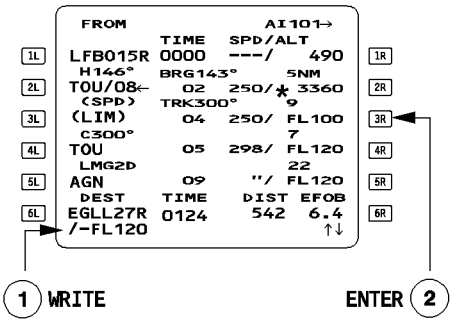
NFC5-04-0510-012-B110AA



The aircraft should be at or below FL120 at AGN and above FL 180 at LACOU.

Entering an altitude constraint through F-PLN A page

The pilot may also enter an altitude constraint directly through the F-PLN A page.
When entering the value into the scratchpad do not forget the slash e.g. /–120 or /–FL 120.
If the slash is omitted the value will be considered as a speed constraint if it is within the range value.

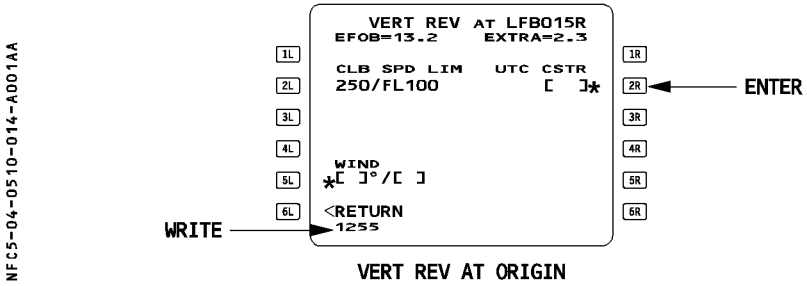


NFCS-04-0510-013-A001AA

Use CLR to delete them directly from the flight plan page, as well. However, if there is also a speed constraint assigned at that waypoint, the clear action deletes it too.

ENTERING AN ESTIMATED TIME OF TAKEOFF

The estimated takeoff time (ETT) is a time entered during preflight at the origin airport. The computer then uses this time as the start time for predictions. The system accepts it during the preflight phase if the ETT is later than the time at which you enter it.



VERT REV AT ORIGIN

Procedure

– PRESS the F-PLN key

R **– SELECT the VERT REV page at departure.**

R **– WRITE the estimated takeoff time into the scratchpad and ENTER it in 2R.**

The display reverts automatically to F-PLN A page.

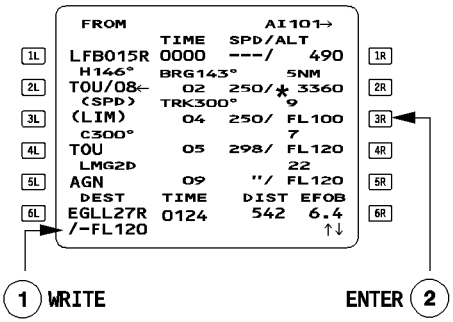
If the aircraft has not taken off by the time entered as estimated takeoff time, the MCDU displays the message "CLK IS TAKE OFF TIME", meaning that the system will replace your estimated takeoff time with the actual time.

When beginning takeoff roll, the system automatically adopts that clock time as the takeoff time.

If the origin airport is changed or the clock time is not valid, the system automatically deletes the estimated takeoff time.

Entering an altitude constraint through F-PLN A page

The pilot may also enter an altitude constraint directly through the F-PLN A page.
When entering the value into the scratchpad do not forget the slash e.g. /–120 or /–FL 120.
If the slash is omitted the value will be considered as a speed constraint if it is within the range value.



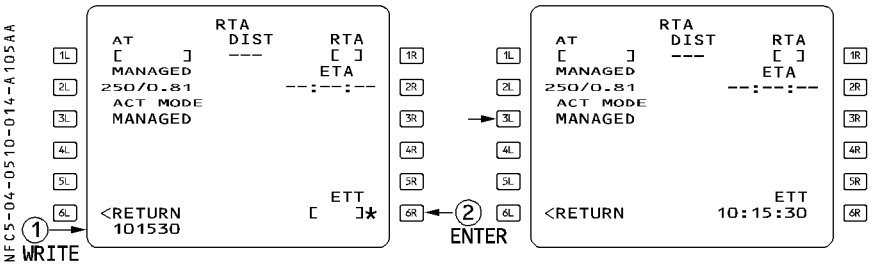
NFC5-04-0510-013-A001AA

Use CLR to delete them directly from the flight plan page, as well. However, if there is also a speed constraint assigned at that waypoint, the clear action deletes it too.

ENTERING AN ESTIMATED TAKEOFF TIME (ETT)

In preflight phase :

- **SELECT the SEC F-PLN key on the MCDU.**
- **SELECT a VERT REV at any waypoint.**
- **SELECT the Required Time of Arrival (RTA) prompt (2R).**
  The MCDU displays the RTA page.
- **ENTER the Estimated Takeoff Time in the [6R] field.**
  The format is HHMMSS (entry of seconds is not mandatory).



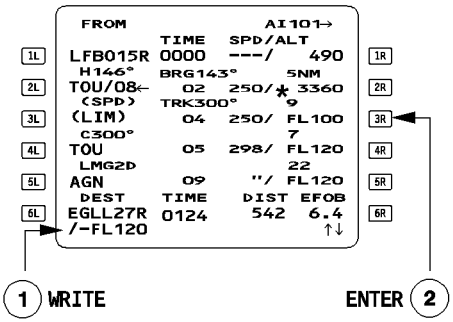
If the aicraft has not taken off by the time entered as the estimated takeoff time, the MCDU displays the "CLK IS TAKEOFF TIME" message, meaning that the system will replace your estimated takeoff time with the actual time.
When begining the takeoff roll, the system automatically adopts that clock time as the takeoff time.
If the origin airport is changed, or the clock time is invalid, the system automatically deletes the estimated takeoff time.

R — **ACCESS the temporary flight plan by pressing [6L] key. Revise as necessary.**

R — **INSERT the temporary flight plan by pressing [6L] key.**

Entering an altitude constraint through F-PLN A page

The pilot may also enter an altitude constraint directly through the F-PLN A page.
When entering the value into the scratchpad do not forget the slash e.g. /–120 or /–FL 120.
If the slash is omitted the value will be considered as a speed constraint if it is within the range value.



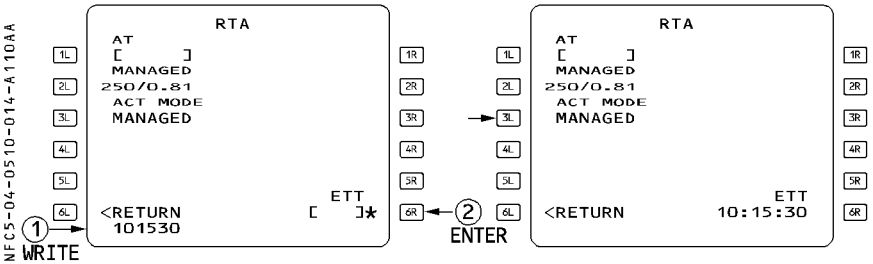
NFCS-04-0510-013-A001AA

Use CLR to delete them directly from the flight plan page, as well. However, if there is also a speed constraint assigned at that waypoint, the clear action deletes it too.

ENTERING AN ESTIMATED TAKEOFF TIME (ETT)

In preflight phase :

- **SELECT the SEC F-PLN key on the MCDU.**
- **SELECT a VERT REV at any waypoint.**
- **SELECT the Required Time of Arrival (RTA) prompt (2R).**
  The MCDU displays the RTA page.
- **WRITE the Estimated Takeoff Time.**
  The format is HHMMSS (entry of seconds is not mandatory).
- **ENTER it in the 6R field.**



R If the aicraft has not taken off by the time entered as the estimated takeoff time, the MCDU displays the "CLK IS TAKE OFF TIME" message, meaning that the system will replace your estimated takeoff time with the actual time.
When begining the takeoff roll, the system automatically adopts that clock time as the takeoff time.
If the origin airport is changed, or the clock time is invalid, the system automatically deletes the estimated takeoff time.

FLIGHT PLAN CHECK

· CHECK the EOSID on the ND plan mode (yellow line).

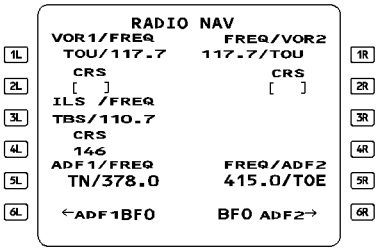
Note : If the details of the EOSID require review, select the EOSID as a TMPY F-PLN and review it as TMPY. Then ERASE it.

SECONDARY F-PLN

Refer to 4.04.30 for details.

RADIO NAV

Whenever a navaid ident is correctly decoded, in agreement with that published, no audio check is necessary.
Morse decoding is displayed on the ND for VOR/DME, VOR/TAC, DME, ADF, and on the PFD for ILS.
Preferably use the identifier for navaid entry.
If the ADF ident is not in the database, be sure to include a decimal point when tuning the frequency (e.g 315. or 325.7).



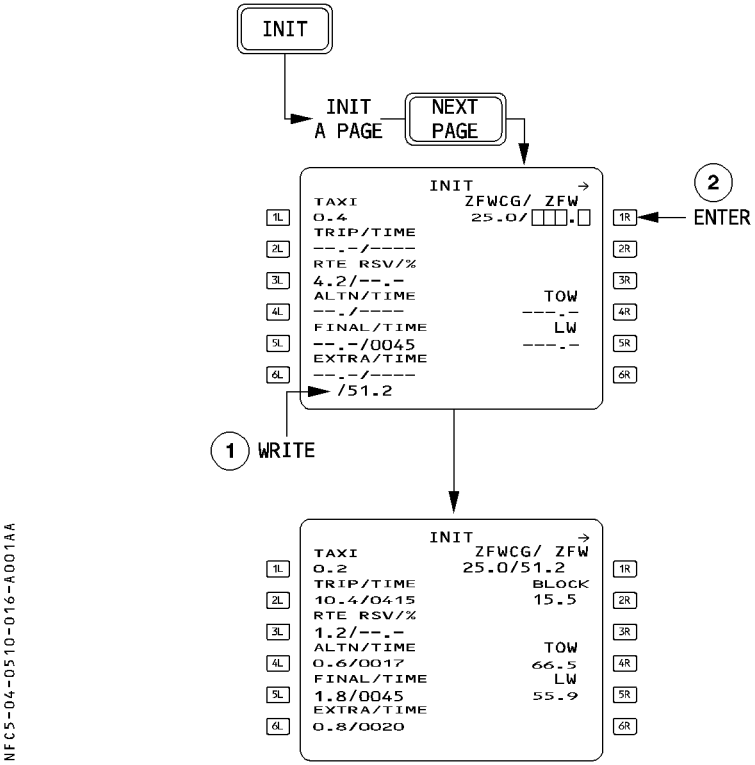
NFC5-04-0510-015-A001AA

R *Note : Whenever, the runway ILS is intented to be retained for guidance after the takeoff*
R *phase, it is recommended to manually tune the ILS by its identifier.*

FMGS DATA INSERTION

GROSS WEIGHT INSERTION

The flight system must have a number for aircraft gross weight (GW) in order to perform all the performance computations.



Procedure

- **CHECK/MODIFY the ZFWCG**
- **ENTER a ZFW**
- **ENTER a BLOCK FUEL**

FLIGHT PLAN CHECK

· CHECK the EOSID on the ND plan mode (yellow line).

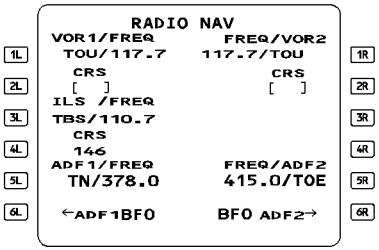
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SECONDARY F-PLN

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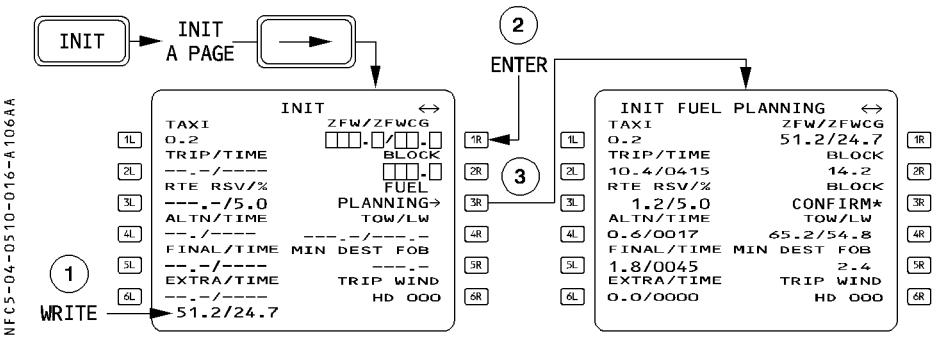
NFC5-04-0510-015-A001AA

R *Note : Whenever, the runway ILS is intented to be retained for guidance after the takeoff*
R *phase, it is recommended to manually tune the ILS by its identifier.*

FMGS DATA INSERTION

WEIGHT/CG INSERTION AND FUEL PLANNING

The flight crew must enter the Zero Fuel Weight (ZFW) and Zero Fuel Weight Center of Gravity (ZFWCG) values on the INIT B page, to allow the FMS to perform the fuel planning computations.



Procedure

– PRESS the INIT key, and the Next ("->") key to access the INIT B page.

– ENTER the ZFW and ZFWCG value in the [1R] field.
The "FUEL PLANNING →" prompt appears in the [3R] field.

Note : As long as the final load sheet is not available, the crew should insert the estimated ZFW/ZFWCG in order to get fuel estimates. The ZFW and ZFWCG values must be updated with the final load sheet values.

– CHECK/MODIFY the TAXI [1L] and RTE RSV [3L] values.
The TAXI and RTE RSV fields display the default values specified in the AMI file (for example, "0.2T" for TAXI, and "5.0 %" for RTE RSV). The flight crew may modify these values.

– CHECK/MODIFY the TRIP WIND value in the [6R] field.
If no wind profile has been entered in the F-PLN, the crew may enter an average TRIP WIND in this field, to have more realistic fuel/time predictions.

Note : 1. If the crew has already defined a wind profile, even partially (such as climb wind), it is not possible to enter a TRIP WIND.
2. If the crew enters a TRIP WIND, and subsequently enters a wind profile on the WIND pages, the TRIP WIND will be erased, and the FMS will use the wind profile defined on the WIND pages for predictions computations.

FLIGHT PLAN CHECK

· CHECK the EOSID on the ND plan mode (yellow line).

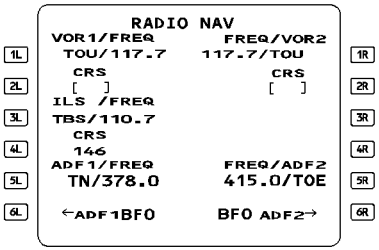
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SECONDARY F-PLN

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RADIO NAV

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Morse decoding is displayed on the ND for VOR/DME, VOR/TAC, DME, ADF, and on the PFD for ILS.
Preferably use the identifier for navaid entry.
If the ADF ident is not in the database, be sure to include a decimal point when tuning the frequency (e.g 315. or 325.7).



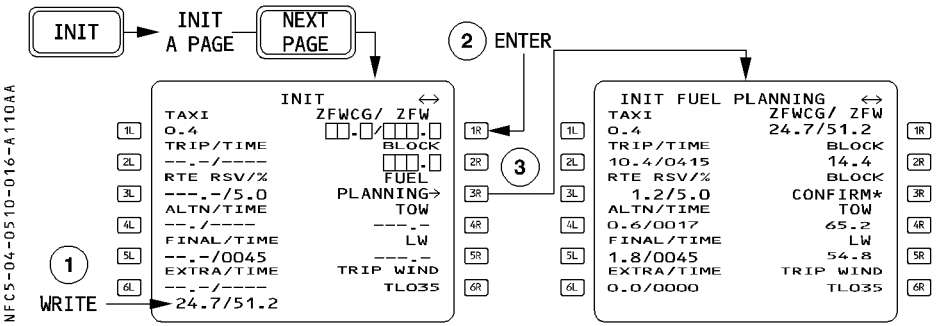
NFC5-04-0510-015-A001AA

R *Note : Whenever, the runway ILS is intented to be retained for guidance after the takeoff*
R *phase, it is recommended to manually tune the ILS by its identifier.*

R **FMGS DATA INSERTION**

R **WEIGHT/CG INSERTION AND FUEL PLANNING**

R The flight crew must enter the Zero Fuel Weight (ZFW) and Zero Fuel Weight Center of
R Gravity (ZFWCG) values on the INIT B page, to allow the FMS to perform the fuel planning
R computations.
R



R **Procedure**

R **– PRESS the INIT key, and the Next ("->") key to access the INIT B page.**

R **– ENTER the ZFWCG and ZFW value in the [1R] field.**
R The "FUEL PLANNING →" prompt appears in the [3R] field.
R
R *Note : As long as the final loadsheet is not available, the flight crew should insert the*
R *estimated ZFWCG/ZFW in order to get fuel estimates. The ZFWCG and ZFW*
R *values must be updated with the final loadsheet values.*

R **– CHECK/MODIFY the TAXI [1L] and RTE RSV [3L] values.**
R The TAXI and RTE RSV fields display the default values specified in the AMI file (for
R example, "0.4T" for TAXI, and "5.0 %" for RTE RSV). The flight crew may modify these
R values.

R **– CHECK/MODIFY the TRIP WIND value in the [6R] field.**
R If no wind profile has been entered in the F-PLN, the flight crew may enter an average
R TRIP WIND in this field, to have more realistic fuel/time predictions.

R *Note : 1. If the flight crew has already defined a wind profile, even partially (such as*
R *climb wind), it is not possible to enter a TRIP WIND.*
R *2. If the flight crew enters a TRIP WIND, and subsequently enters a wind profile*
R *on the WIND pages, the TRIP WIND will be deleted, and the FMS will use the*
R *wind profile defined on the WIND pages for predictions computations.*

– CHECK/MODIFY the TAXI FUEL.

– CHECK/MODIFY the RTE RSV.

– CHECK/MODIFY the FINAL/TIME.

Note : – As long as the final loadsheet is not available, the flight crew may insert the estimated ZFWCG/ZFW in order to get fuel, time, and altitude estimates. The ZFWCG and ZFW must be updated with the final loadsheet.

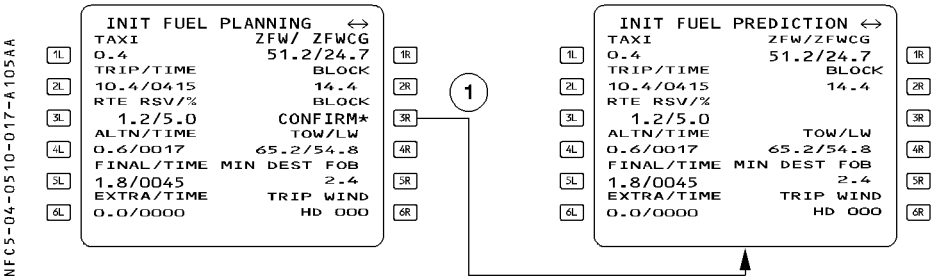
– Insert the ZFWCG/ZFW/BLOCK fuel preferably after F-PLN completion. If inserted before F-PLN completion, the FMGC automatically recomputes the predictions at each F-PLN change, including weight or wind changes. Therefore, F-PLN completion takes more time than normal.

– **PRESS the FUEL PLANNING prompt [3R].**
The FMS computes the required BLOCK fuel in order to have EXTRA fuel = 0, based on the parameters entered on the INIT and F-PLN pages. The computed BLOCK fuel value is displayed in the [2R] field, and a BLOCK CONFIRM prompt appears in the [3R] field.

Note : In order to obtain a realistic BLOCK fuel computation, the flight crew should ensure that the F-PLN initialization has been completed (including ALTN if necessary), and that flight parameters, such as CRZ FL, steps climbs (if any), and winds, have been inserted, before using the FUEL PLANNING function.

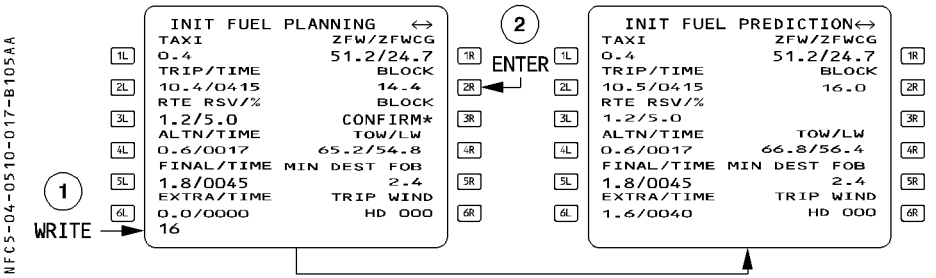
The flight crew must check the FMS-computed BLOCK fuel value against the actual block fuel required for the flight. Fuel planning must not be based only on FMS predictions.

- **If the computed BLOCK fuel corresponds to the actual block fuel required for the flight :**



– **PRESS the BLOCK CONFIRM prompt [3R].**
The FMS computes all the predictions, based on the computed BLOCK fuel.

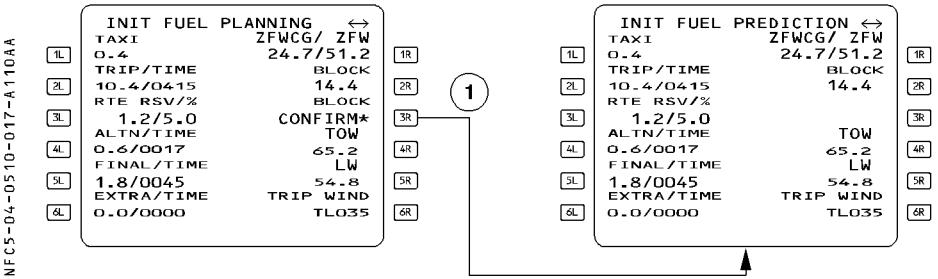
- **If the computed BLOCK fuel does NOT correspond to the actual block fuel required for the flight :**



– **ENTER the desired BLOCK fuel in the [2R] field.**
The FMS computes the predictions, based on the entered BLOCK fuel, and estimates the EXTRA fuel value.

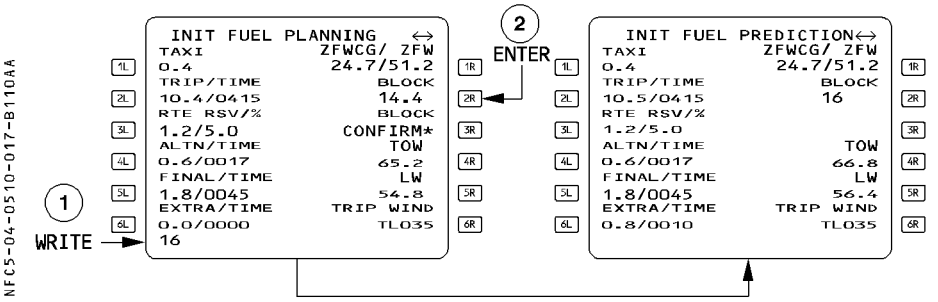
R — **PRESS the FUEL PLANNING prompt [3R].**
R The FMS computes the required BLOCK fuel in order to have EXTRA fuel = 0, based on
R the parameters entered on the INIT and F-PLN pages. The computed BLOCK fuel value
R is displayed in the [2R] field, and a BLOCK CONFIRM prompt appears in the [3R] field.
R
R *Note : In order to obtain a realistic BLOCK fuel computation, the flight crew should*
R *ensure that the F-PLN initialization has been completed (including ALTN if*
R *necessary), and that flight parameters, such as CRZ FL, steps climbs (if any), and*
R *winds, have been inserted, before using the FUEL PLANNING function.*
R
R The flight crew must check the FMS-computed BLOCK fuel value against the actual
R block fuel required for the flight. Fuel planning must not be based only on FMS
R predictions.

R ● **If the computed BLOCK fuel corresponds to the actual block fuel required for**
R **the flight :**
R



R — **PRESS the BLOCK CONFIRM prompt [3R].**
R The FMS computes all the predictions, based on the computed BLOCK fuel.

R ● **If the computed BLOCK fuel does NOT correspond to the actual block fuel**
R **required for the flight :**
R



R — **ENTER the desired BLOCK fuel in the [2R] field.**
R The FMS computes the predictions, based on the entered BLOCK fuel, and estimates
R the EXTRA fuel value.

R ● **When the BLOCK has been entered :**

R **– CHECK/ MODIFY the FINAL/TIME [5L] values.**
R If the flight crew modifies the FINAL or TIME values, the EXTRA fuel value will be
R modified accordingly.

Note : The ALTN value computed by the FMS may differ from the value retained on the operational flight plan, since some computation hypothesis (such as, for example, the route, wind profile, CRZ FL, CI) may differ.

R **– PRINT the PREFLIGHT REPORT, if necessary**
R When the final loadsheet values (ZFWCG/ZFW/BLOCK) have been entered, and the
R FUEL PLANNING is completed, the flight crew may print the pre-flight report, which
R provides a copy of the F-PLN with the associated FMS predictions.

- **When the BLOCK fuel has been entered :**

  – **CHECK/ MODIFY the FINAL/TIME [5L] values.**
  If the crew modifies the FINAL or TIME values, the EXTRA fuel value will be modified accordingly.

  – **CHECK/ MODIFY the MIN DEST FOB [5R], if necessary.**
  The MIN DEST FOB value is defaulted to ALTN + FINAL. If necessary, modify the MIN DEST FOB value to specify a required minimum FOB at destination.

  Note : 1. The ALTN value computed by the FMS may differ from the value retained on the operational flight plan, since some computation hypothesis (such as, for example, the route, wind profile, CRZ FL, CI) may differ.
  2. Modifying the MIN DEST FOB value will not update the EXTRA fuel value accordingly : The EXTRA fuel calculation is independent from the MIN DEST FOB value.

  – **PRINT the PREFLIGHT REPORT, if necessary**
  When the final load sheet values (ZFW/ZFWCG/BLOCK) have been entered, and the FUEL PLANNING is completed, the crew may print the pre-flight report, which provides a copy of the F-PLN with the associated FMS predictions.

R **TAKEOFF WITH NO WEIGHT/CG ENTRY - WEIGHT/CG DATA LOST BY THE FMGC**

R If weight/CG data have not been entered, or if the FMGC loses the values due to a power
R interruption, managed speed will only be available for the takeoff phase (provided a V2 has
R been inserted).
R After engine start, the MCDU displays "INITIALIZE WEIGHTS".
R If the flight crew does not enter weight/CG data, the following occurs :
R · At takeoff, the Speed Reference System (SRS) mode is available
R · When the aircraft leaves the SRS mode, the target speed becomes the current speed and
R reverts to selected speed.

R *Note : If the AP/FD has reverted to ALT or V/S (FPA) mode, the associated A/THR mode*
R *is SPEED. In this case, the system will probably reduce thrust, because the speed*
R *will be equal to, or greater than, the target speed.*

R ● **To regain a normal speed target, the flight crew must :**

R **– SELECT the appropriate speed on the FCU and PULL the speed knob**

R **– INSERT the GW/CG values on the FUEL PRED page.**

R **INSERTING WEIGHT/CG AFTER ENGINE START**

R The flight crew must enter the ZFWCG/ZFW values on INIT B page prior to engine start.
R After engine start, the flight crew can enter the GW/CG values on the FUEL PRED page.

R **– PRESS the FUEL PRED key**

R **– INSERT the GW/CG values in the [4R] field.**
R This allows predictions and performance computation.

R *Note : Before flight crew entry, the CG is defaulted to 25 %.*

TAKEOFF WITH NO WEIGHT/CG ENTRY – WEIGHT/CG DATA LOST BY THE FMGS

If Weight/CG data have not been entered, or if the FMGC loses the values due to a power interruption, managed speed will only be available for the takeoff phase (provided a V2 has been inserted).
After engine start, the MCDU displays "INITIALIZE WEIGHTS".
If the crew does not enter weight/CG data, the following occurs :
· At takeoff, the Speed Reference System (SRS) mode is available,
· When the aircraft leaves the SRS mode, the target speed becomes the current speed and reverts to selected.

Note : If the AP/FD has reverted to ALT or V/S (FPA) mode, the associated A/THR mode is SPEED. In that case, the system will probably reduce thrust, because the speed will be equal to or greater than the target speed.

● **To regain a normal speed target, the crew must :**

– **SELECT the appropriate speed on the FCU and PULL the speed knob,**

– **INSERT the ZFW/ZFWCG values on the FUEL PRED page.**

Note : The crew can also insert the GW/CG values on the FUEL PRED page.

INSERTING WEIGHT/CG AFTER ENGINE START

The flight crew must enter the ZFW/ZFWCG values on the INIT B page prior to engine start. After engine start, the crew can enter the ZFW/ZFWCG values (or the GW/CG values) on the FUEL PRED page.

– **PRESS the FUEL PRED key.**

– **INSERT the ZFW/ZFWCG values in the [4R] field.**
This allows predictions and performance computation.

TAKEOFF WITH NO GROSS WEIGHT ENTRY (GW) - GROSS WEIGHT LOST BY THE FMGS

If a GW is not entered, or if the FMGS loses the number due to a power interruption, managed speed will be only available for the takeoff phase and, then, only if V2 has been inserted.
After engine start, the MCDU displays "INITIALIZE WEIGHTS".
If the pilot does not respond, the following occurs :

- At takeoff, the speed reference system (SRS) mode remains active until the aircraft reaches acceleration altitude (ACC ALT), or engages another vertical mode.
- When the aircraft leaves the SRS mode, the target speed becomes the current speed and is no longer managed.

Note : If the AP/FD has reverted to ALT or V/S or FPA, the associated A/THR mode is SPEED. In that case, the system will probably reduce thrust, because the speed will be equal to or greater than the target speed.

● **To regain a normal speed target, the pilot must :**

– SELECT the appropriate climb speed on the FCU and PULL out the knob.

– INSERT the FOB, if necessary, and GW on the FUEL PRED page.

– PRESS the SPD pushbutton on FCU to get managed speed target.

INSERTING GW AND CG AFTER ENGINE START

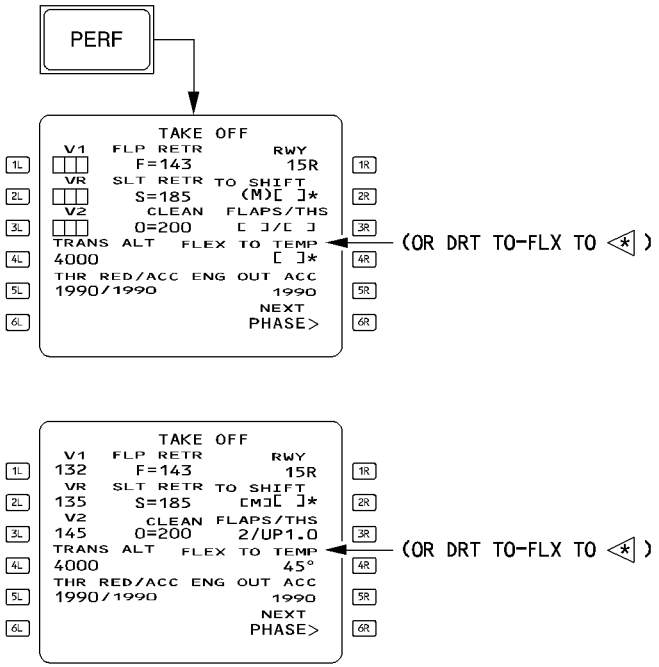
The pilot must enter the ZFW and ZFWCG on the INIT B page before engine start. If this is not done, the pilot can enter the GW and CG after engine start on the FUEL PRED page.

– ACCESS to the FUEL PRED PAGE.

– INSERT the gross weight and center of gravity. This allows performance computation.

TAKEOFF DATA INSERTION

R



NFC5-04-0510-019-A001AB

Procedure

– PRESS the PERF key on the MCDU.

– WRITE successively and ENTER : V1, VR, V2.

R **– WRITE successively and ENTER T.O. SHIFT and FLX TEMP or DRT TO ◁**
(see procedure next page)

– CHECK/MODIFY the THR RED ALT* (Thrust reduction altitude).

– CHECK/MODIFY the ACC ALT* (acceleration altitude).

– CHECK/MODIFY the ENG OUT ACC* (engine out acceleration altitude).

– CHECK/MODIFY the TRANS ALT* (transition altitude)

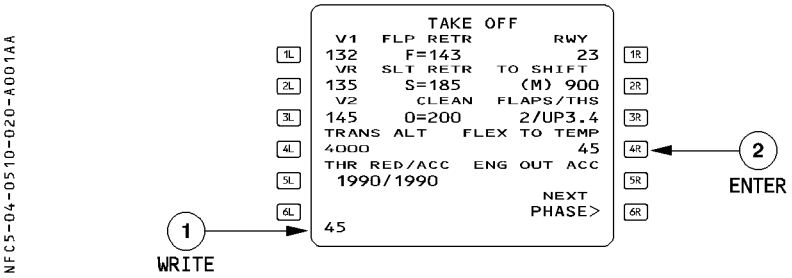
– CHECK V1, V2 on PFD **

* Altitudes less than 400 feet above airfield elevation cannot be selected.

** If the PFD does not display V2 at the top of its speed scale, check that at least one FD is ON.

ENTERING A FLEX TEMPERATURE

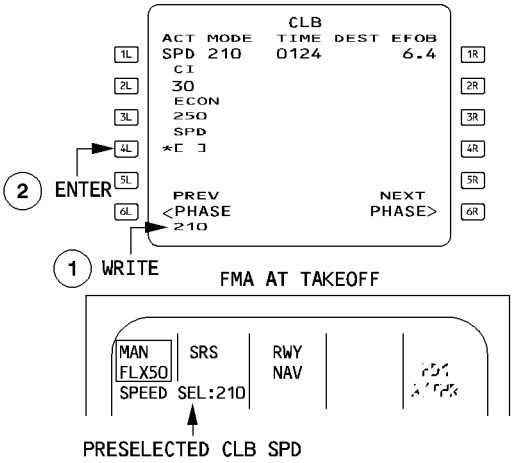
R — **WRITE the desired flex temperature in the scratchpad and ENTER using the [4R] key.**



CLIMB SPEED PRESELECTION

If the managed speeds for the initial climb are not suitable, the pilot can preselect an appropriate climb speed on the "PERF CLB" page, as long as the climb phase is not active.
The CLB SPD preselection applies when :

- ATC specifies an initial climb speed.
- The initial climb speed must be lower than normal because :
  - There are to be turns greater than 120° in the initial climb out.
  - Obstacle clearance, or some other situation, requires a high climb angle.
  - The airfield has a risk area to be quickly cleared (birds reported, for example).



NFC5-04-0510-021-A100AA

Procedure

– PRESS the PERF key on the MCDU.

R The PERF TAKEOFF page is displayed.

R **– SELECT the "NEXT PHASE" [6R] key to display the CLB page.**

– WRITE a climb speed and ENTER it.

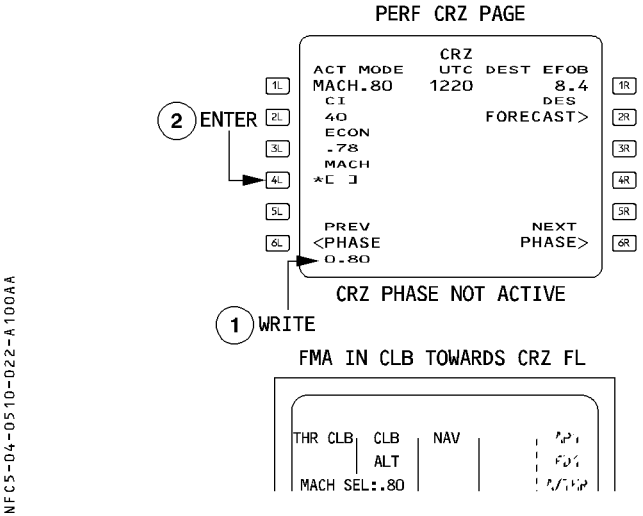
– To revert to managed speed, select ECON by pressing [3L].

When the aircraft is transitioning into the climb phase, the preselected value becomes the target speed :

- The selected speed target is active.
- The primary flight display shows the target speed in blue.
- The FCU's speed window displays the new speed or Mach number.

CRUISE MACH (SPEED) PRESELECTION

The pilot preselects a cruise Mach when a Mach number other than the ECON cruise Mach number is required.
When the aircraft transitions to the cruise phase, the speed target symbol goes to the preselected value and MACH (or SPD) becomes selected (blue target on PFD, target MACH shown in the speed/Mach window of the FCU).



Procedure

– PRESS the PERF key on the MCDU.

R **– PRESS the "NEXT PHASE" [6R] key on the MCDU, until the CRZ page is accessed.**

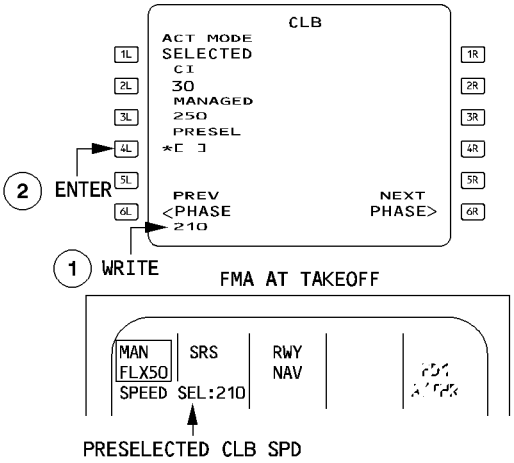
– WRITE a cruise Mach (or speed) in the scratchpad and ENTER it in [4L].

– To revert to managed speed, PRESS [3L].
When the cruise phase is active, you cannot preselect a cruise Mach or speed.

CLIMB SPEED PRESELECTION

If the managed speeds for the initial climb are not suitable, the pilot can preselect an appropriate climb speed on the "PERF CLB" page, as long as the climb phase is not active.
The CLB SPD preselection applies when :

- ATC specifies an initial climb speed.
- The initial climb speed must be lower than normal because :
  - There are to be turns greater than 120° in the initial climb out.
  - Obstacle clearance, or some other situation, requires a high climb angle.
  - The airfield has a risk area to be quickly cleared (birds reported, for example).



NFC5-04-0510-021-A110AA

Procedure

– PRESS the PERF key on the MCDU.

R The PERF TAKEOFF page is displayed.

R **– SELECT the "NEXT PHASE" [6R] key to display the CLB page.**

– WRITE a climb speed and ENTER it.

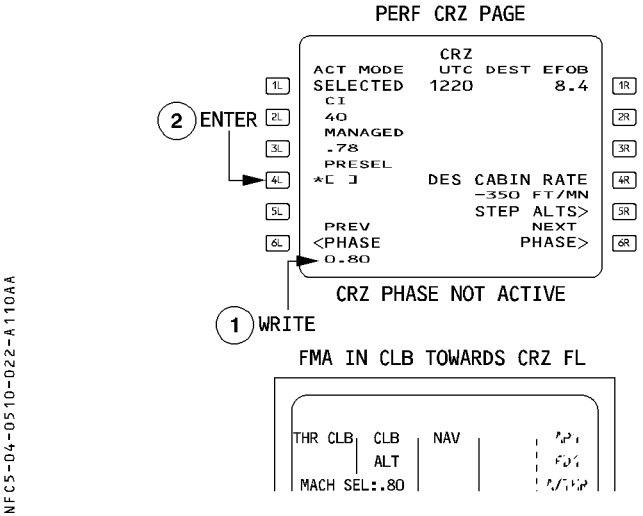
– To revert to managed speed, select MANAGED by pressing [3L].

When the aircraft is transitioning into the climb phase, the preselected value becomes the target speed :

- The selected speed target is active.
- The primary flight display shows the target speed in blue.
- The FCU's speed window displays the new speed or Mach number.

CRUISE MACH (SPEED) PRESELECTION

The pilot preselects a cruise Mach, when a Mach number other than the ECON cruise Mach number is required.
When the aircraft transitions to the cruise phase, the speed target symbol goes to the preselected value and "SELECTED" becomes the active speed mode (blue target on PFD, target MACH shown in the speed/Mach window of the FCU).



Procedure

– PRESS the PERF key on the MCDU.

R **– PRESS the "NEXT PHASE" [6R] key on the MCDU, until the CRZ page is accessed.**

– WRITE a cruise Mach (or speed) in the scratchpad and ENTER it in [4L].

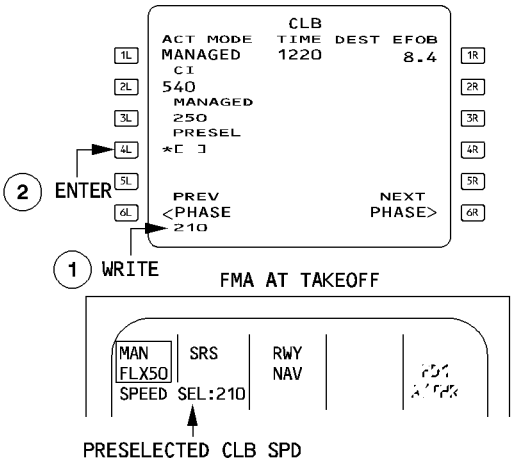
– To revert to managed speed, PRESS [3L].
When the cruise phase is active, you cannot preselect a cruise Mach or speed.

CLIMB SPEED PRESELECTION

If the managed speeds for the initial climb are not suitable, the pilot can preselect an appropriate climb speed on the "PERF CLB" page, as long as the climb phase is not active.
The CLB SPD preselection applies, when the :

– ATC specifies an initial climb speed.
– Initial climb speed must be lower than normal because :
  · There are to be turns greater than 120° in the initial climb out.
  · Obstacle clearance, or some other situation, requires a high climb angle.
  · The airfield has a risk area to be quickly cleared (birds reported, for example).

R



NFC5-04-0510-021-A120AA

Procedure

– PRESS the PERF key on the MCDU.
The PERF TAKE OFF page is displayed.

– SELECT the PERF CLB page by pressing [6 R] ("NEXT PHASE" prompt).

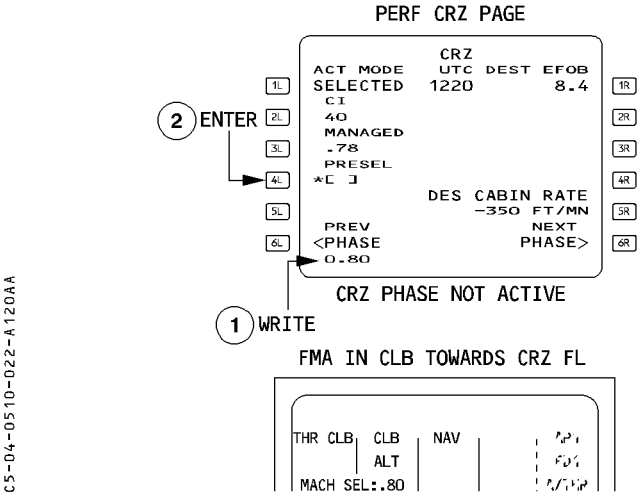
– WRITE a climb speed and ENTER it.

– To revert to managed speed, select MANAGED by pressing [3L].
When the aircraft is transitioning into the climb phase, the preselected value becomes the target speed :

– The selected speed target is active.
– The primary flight display shows the target speed in blue.
– The FCU's speed window displays the new speed or Mach number.

CRUISE MACH (SPEED) PRESELECTION

The pilot preselects a cruise Mach, when a Mach number other than the ECON cruise Mach number is required.
When the aircraft transitions to the cruise phase, the speed target symbol goes to the preselected value and "SELECTED" becomes the active speed mode (blue target on PFD, target MACH shown in the speed/Mach window of the FCU).



Procedure

- **PRESS the PERF key on the MCDU.**
- **PRESS the NEXT PHASE prompt [6R] key on the MCDU, until the CRZ page is accessed.**
- **WRITE a cruise Mach (or speed) in the scratchpad and ENTER it in [4L].**
- **To revert to managed speed, PRESS [3L].**
  When the cruise phase is active, you cannot preselect a cruise Mach or speed.

ENTERING A HEADING/TRACK PRESET FUNCTION

The heading/track preset allows the pilot to preset a takeoff or go-around heading or track before commanding the aircraft to take up that heading or track (manual activation).
The flight crew can enter a heading or a track preset while the aircraft is on the ground and until takeoff.

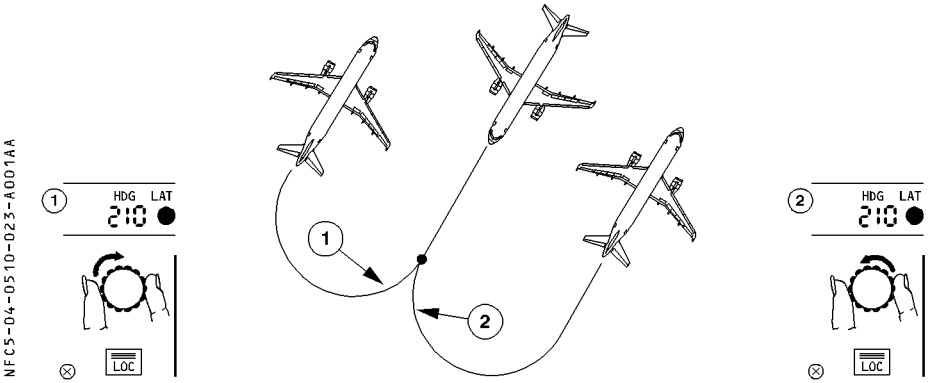
Procedure

Before takeoff :

– **SET the appropriate HDG or TRK in the FCU window.**
This disarms the navigation mode and allows the runway mode to remain engaged after takeoff.

After takeoff :

– **PULL HDG/TRK selector knob.**
The heading or track mode engages on the preset value.

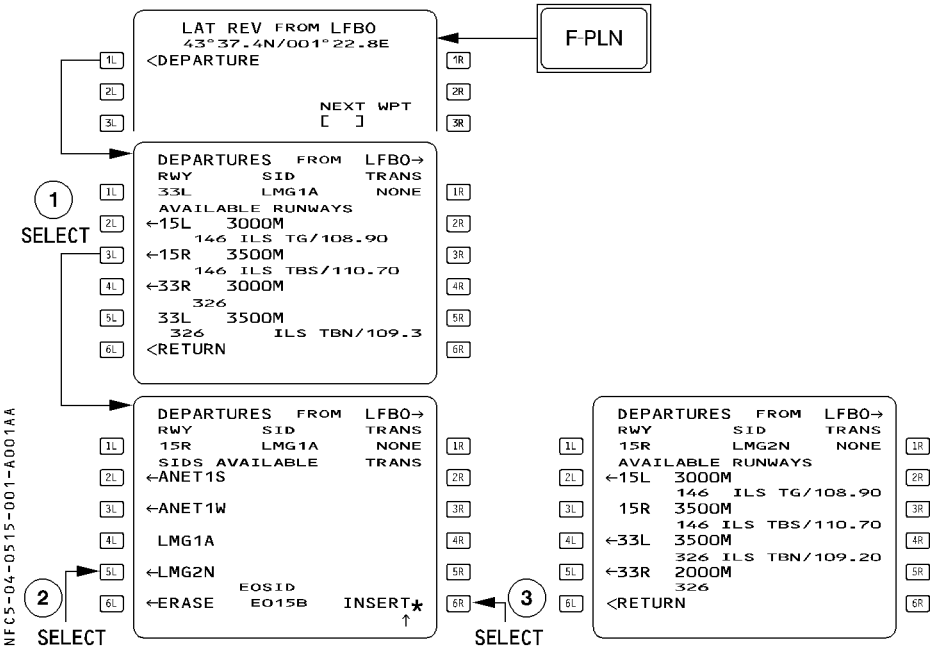


The direction in which the pilot rotates the HDG/TRK selection knob usually determines the direction of the turn. A left rotation (decreasing heading) produces a left turn ; a right rotation produces a right turn.
However, when a heading has been preset before takeoff or go-around, the direction of the turn will be such as to cause the shortest turn at the moment of engagement.

CANCELLING THE HEADING/TRACK PRESET FUNCTION

The pilot can cancel the heading preset by pushing the HDG/TRK selector knob back in again. This engages or arms the NAV mode.

CHANGE OF RUNWAY



– **PRESS the F-PLN key on MCDU**

– **SELECT the LAT REV page at origin**

– **SELECT the DEPARTURE prompt [1L]**

– **SELECT the new RWY in use**

– **SELECT the appropriate SID and TRANS.**

– **CHECK the resulting temporary F-PLN and INSERT it.**

R – **ENTER the new V1, VR, V2, FLX TO TEMP (or derated thrust if installed) and**
R **CONFIGURATION as appropriate.**

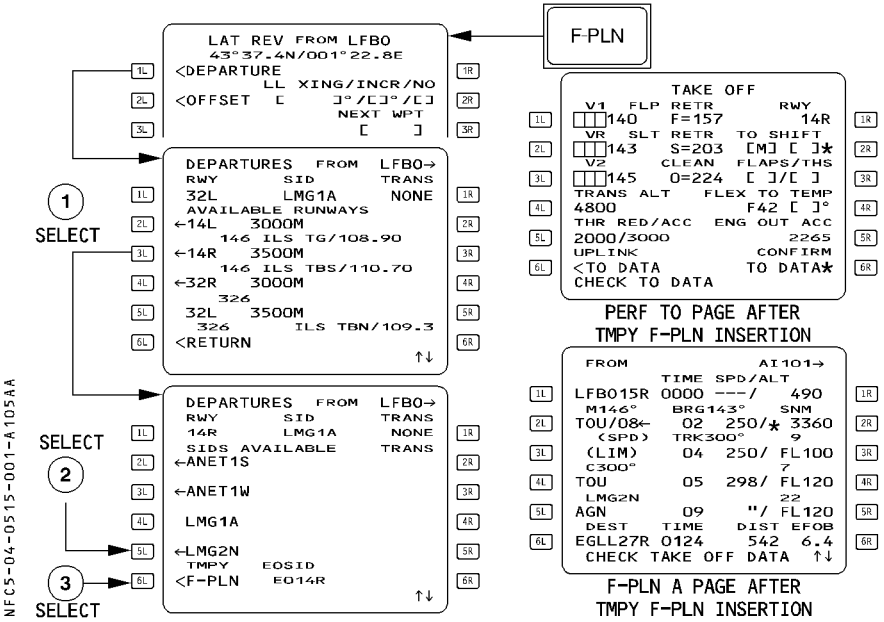
Note : If the previously selected SID is compatible with the new runway, it appears automatically in the temporary flight plan. Any revision the pilot may have made to the previous SID will not be transferred.
If the pilot still wants it, he has to reenter it.

TAKEOFF FROM INTERSECTION

- **Use RTOW or FCOM to revise takeoff parameters :**
- **PRESS the [PERF] key on MCDU**
- **ENTER the takeoff shift**
- **ENTER the new V1, VR, V2, FLX TEMP, or CONF, as appropriate**

Note : The insertion of the shift in takeoff position permits the system to make an accurate revision to its navigation data at takeoff.

CHANGE OF RUNWAY



- **PRESS the F-PLN key on the MCDU.**
- **SELECT the LAT REV at origin.**
- **SELECT the DEPARTURE prompt [1L].**
- **SELECT the new RWY in use.**
- **SELECT the appropriate SID and TRANS.**
- **CHECK the resulting temporary F-PLN and INSERT it.**
  Scratchpad display the CHECK TO DATA message, if the PERF TO page was already filled in.

– **ENTER the new V1, VR, V2, FLEX TEMP or CONF, as appropriate.**
The previously-entered values, adjacent to the boxes, may be re-selected by pressing the CONFIRM TO DATA* prompt on [6R].

Note : In case of a runway change, any previous lateral modification performed on the active DEPARTURE procedure may lead to additional waypoint stacking in the temporary F-PLN. The crew has to check and revise it, as necessary.
Refer to 4.04.18 "CHANGING THE DEPARTURE".

TAKEOFF FROM INTERSECTION

– **Use RTOW or FCOM to revise takeoff parameters :**

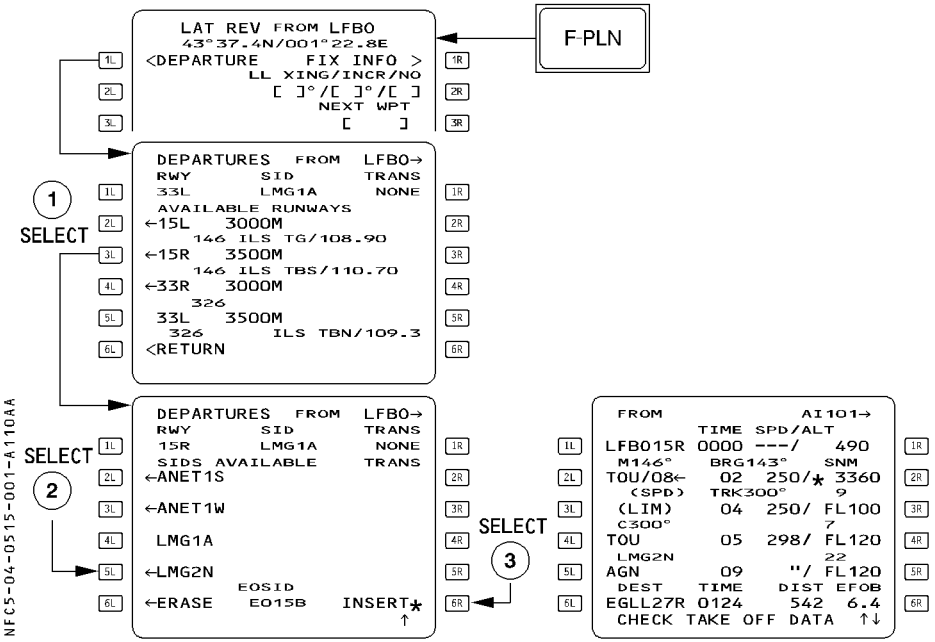
– **PRESS the [PERF] key on MCDU**

– **ENTER the takeoff shift**

– **ENTER the new V1, VR, V2, FLX TEMP, or CONF, as appropriate**

Note : The insertion of the shift in takeoff position permits the system to make an accurate revision to its navigation data at takeoff.

CHANGE OF RUNWAY



- **PRESS the F-PLN key on the MCDU.**
- **SELECT the LAT REV at origin.**
- **SELECT the DEPARTURE prompt [1L].**
- **SELECT the new RWY in use.**
- **SELECT the appropriate SID and TRANS.**
- **CHECK the resulting temporary F-PLN and INSERT it.**
  CHECK TAKE OFF DATA comes up in the scratchpad if the PERF TO page had been filled in.
- **ENTER the new V1, VR, V2, FLEX TEMP or CONF, as appropriate.**

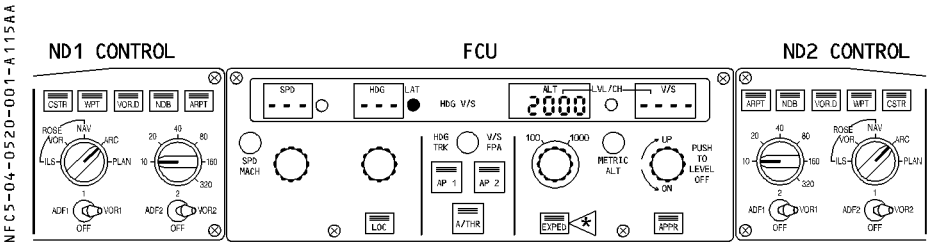
  Note : If the previously selected SID is compatible with the new runway, it automatically appears in the temporary flight plan. Any revision the pilot may have made to the previous SID will not be transferred.
  If the pilot still wants it, he has to reenter it.

TAKEOFF FROM INTERSECTION

- **Use RTOW or FCOM to revise takeoff parameters :**
- **PRESS the [PERF] key on MCDU**
- **ENTER the takeoff shift**
- **ENTER the new V1, VR, V2, FLX TEMP, or CONF, as appropriate**

Note : The insertion of the shift in takeoff position permits the system to make an accurate revision to its navigation data at takeoff.

FCU SELECTION FOR TAKEOFF

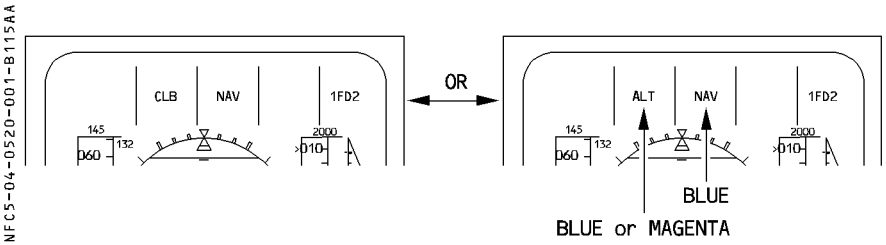


Procedure

- **ENSURE that HDG – V/S modes are selected (change over pb).**
- **CONFIRM or SELECT the first cleared altitude**
- **CROSS CHECK on PFD the target altitude**
- **CONFIRM both FDs ON**

FMA MODE CHECK

- **CHECK that the FMA CLB (or ALT) mode is armed**

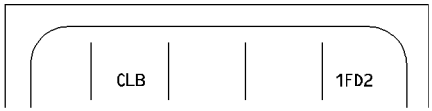


Note : ALT (in blue or magenta) may be displayed instead of CLB if the FCU altitude or a constraint is set at or below the acceleration altitude.

Note : If a radar-vector standard instrument departure (SID) has been selected, a F-PLN discontinuity immediately follows the departure runway, and NAV mode is not armed. After takeoff, RWY TRK mode engages until the crew selects a HDG or performs a DIR TO.

If a HDG/TRK was preset, NAV is disarmed.

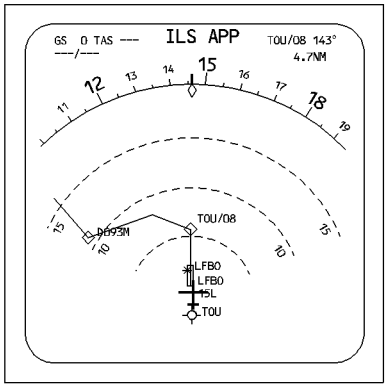
NFC5-04-0520-002-A100AA



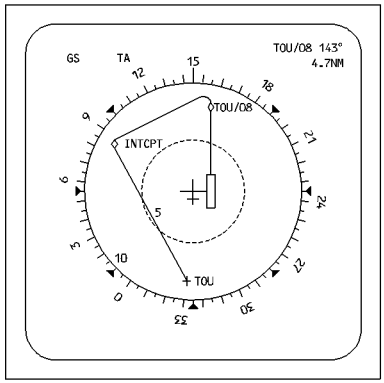
R SELECTING A NAVIGATION DISPLAY

R SET the minimum range to display the first waypoint after departure or as required for
R weather radar.

NFC5-04-0520-002-B100AA



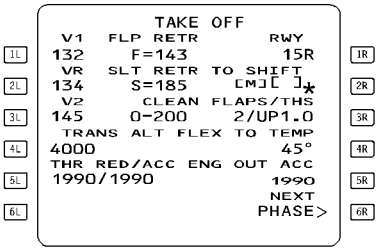
ARC mode
FOR DEPARTURE IN GENERAL DIRECTION
OF RUNWAY HEADING



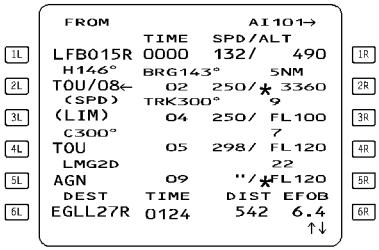
Rose NAV mode
FOR DEPARTURE IN DIRECTION OPPOSITE
TO THAT OF RUNWAY HEADING

R SELECTING TAKEOFF DISPLAYS FOR PILOT'S AND COPILOT'S MCDU

NFC5-04-0520-002-C100AA

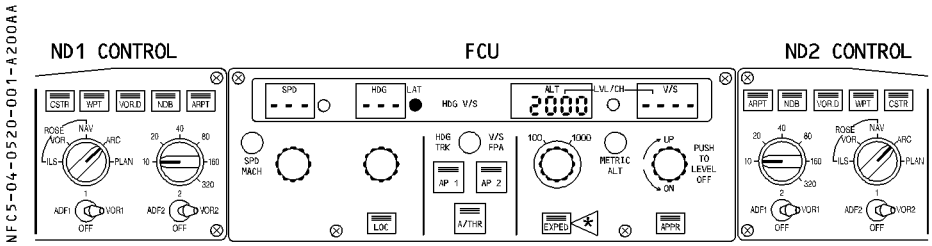


PF SELECTS PERF T.O. PAGE



PNF SELECTS F-PLN A PAGE

FCU SELECTION FOR TAKEOFF

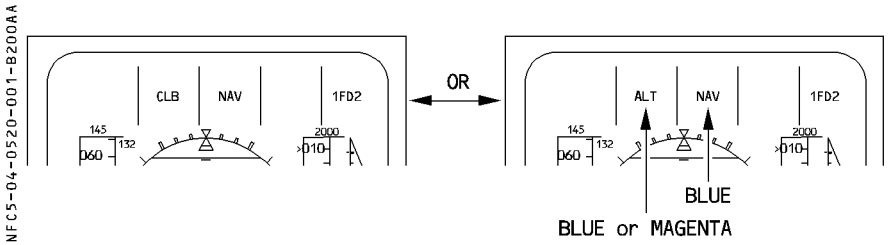


Procedure

- **ENSURE that HDG – V/S modes are selected (change over pb).**
- **CONFIRM or SELECT the first cleared altitude**
- **CROSS CHECK on PFD the target altitude**
- **CONFIRM both FDs ON**

FMA MODE CHECK

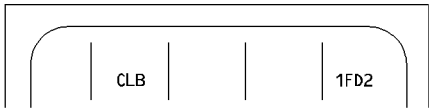
- **CHECK that the FMA CLB (or ALT) mode is armed**



Note : ALT (in blue or magenta) may be displayed instead of CLB if the FCU altitude or a constraint is set at or below the acceleration altitude.

If a HDG/TRK was preset, NAV is disarmed.

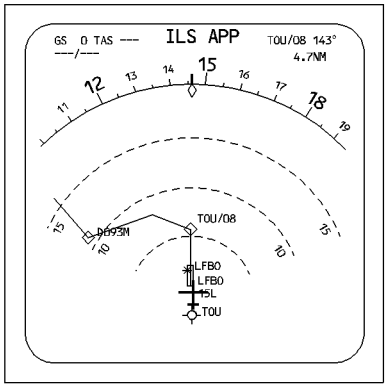
NFC5-04-0520-002-A100AA



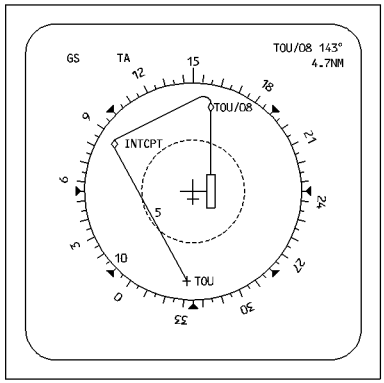
R SELECTING A NAVIGATION DISPLAY

R SET the minimum range to display the first waypoint after departure or as required for
R weather radar.

NFC5-04-0520-002-B100AA



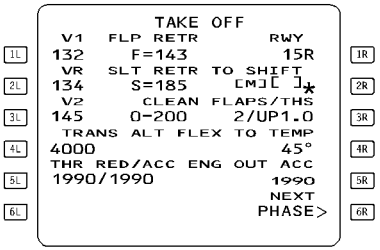
ARC mode
FOR DEPARTURE IN GENERAL DIRECTION
OF RUNWAY HEADING



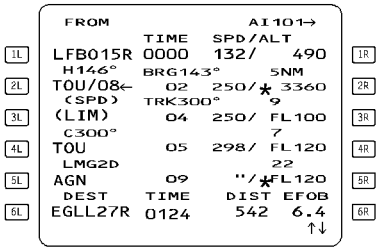
Rose NAV mode
FOR DEPARTURE IN DIRECTION OPPOSITE
TO THAT OF RUNWAY HEADING

R SELECTING TAKEOFF DISPLAYS FOR PILOT'S AND COPILOT'S MCDU

NFC5-04-0520-002-C100AA



PF SELECTS PERF T.O. PAGE



PNF SELECTS F-PLN A PAGE

MONITORING THE TAKEOFF

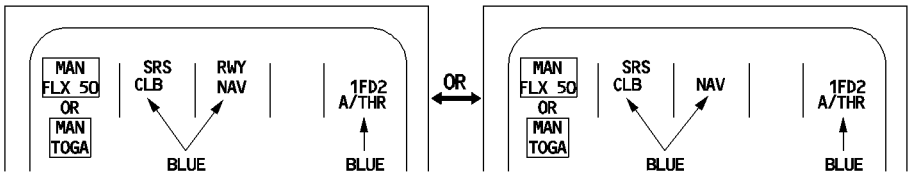
- **At power set (thrust levers in FLX or TOGA position)**

  – **CHECK that the navigation is updated to the runway threshold by verifying that the aircraft symbol is centered on the runway threshold of the navigation display.**

  – **CHECK the FMA for appropriate mode selection**

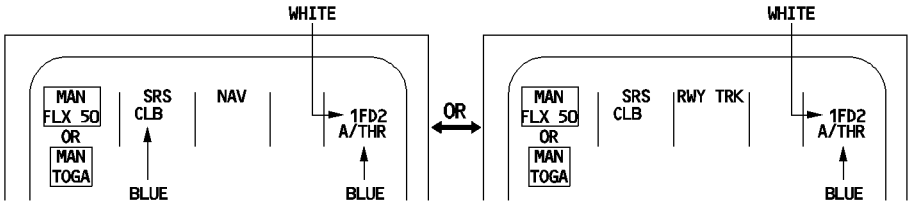
  Note : RWY mode appears if an ILS is tuned to a station corresponding to the departure runway. Otherwise no lateral mode comes up until the aircraft has lifted off.

NFC5-04-0530-001-A120AB

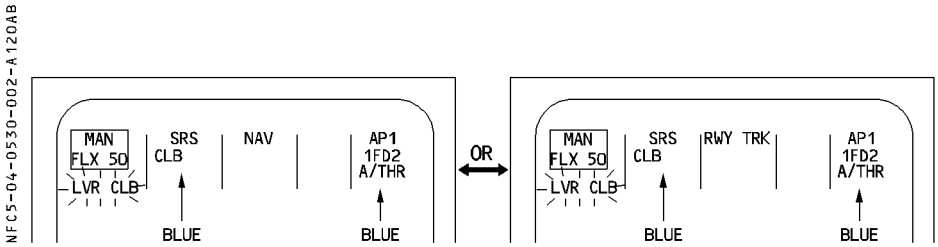


- **At 30 feet**
  - If NAV is armed, it engages automatically.
  - If NAV is not armed, RWY TRK mode engages and remains displayed until the crew selects another lateral mode.

NCF5-04-0530-001-B120AB



- **At 100 feet**
  You may engage AP1 or AP2.
  The FMGS has an internal delay that prevents the AP to be engaged during 5 seconds after lift-off.
- **At thrust reduction altitude**
  "LVR CLB" flashes in the first column of the FMA

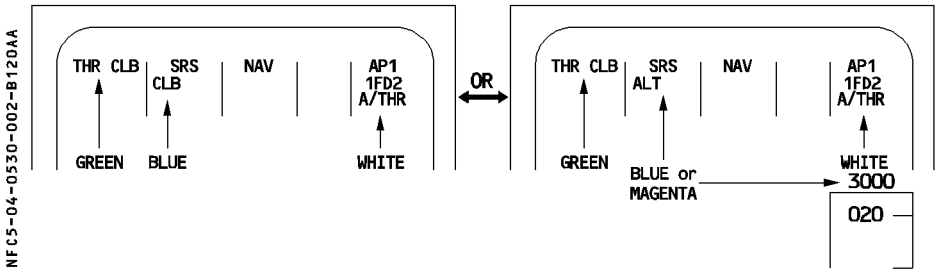


Procedure

– **SET the thrust levers to the CL detent**
  A/THR activates automatically

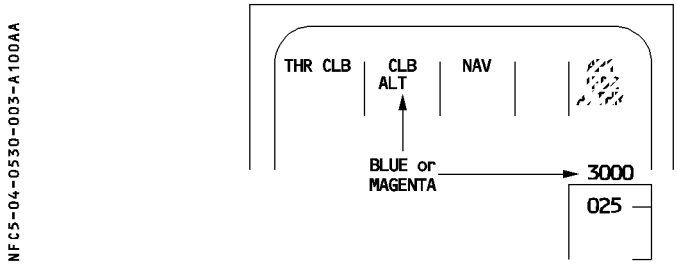
– **CHECK that A/THR turns to white in the 5th FMA column.**

– **CHECK that THR CLB appears in green in the first column.**



Depending on the next level off altitude, CLB or ALT is armed and displayed in the second column.
ALT is armed :
– in blue if the next predicted level-off is the FCU-selected altitude (target altitude blue at the top of the ALT scale)
– in magenta if the next predicted level-off is an ALT CSTR (target altitude magenta at the top of the ALT scale)

- **At acceleration altitude**
  The vertical phase automatically switches to climb.
  CLB mode engages. The target speed jumps to initial climb speed on the PFD.



Procedure

– CHECK that "CLB" appears in green in the second FMA column.
- The speed reference system (SRS) mode remains engaged until CLB phase is engaged, which occurs at ACCEL ALT or at any other vertical mode engagement, whichever comes first.
- If during takeoff the FCU altitude is set below the current aircraft altitude, the system ignores the FCU altitude and the aircraft remains in SRS mode until the pilot selects an altitude above the aircraft altitude or engages any other mode.

R **PRESELECTING A HDG OR A TRK**

Procedure

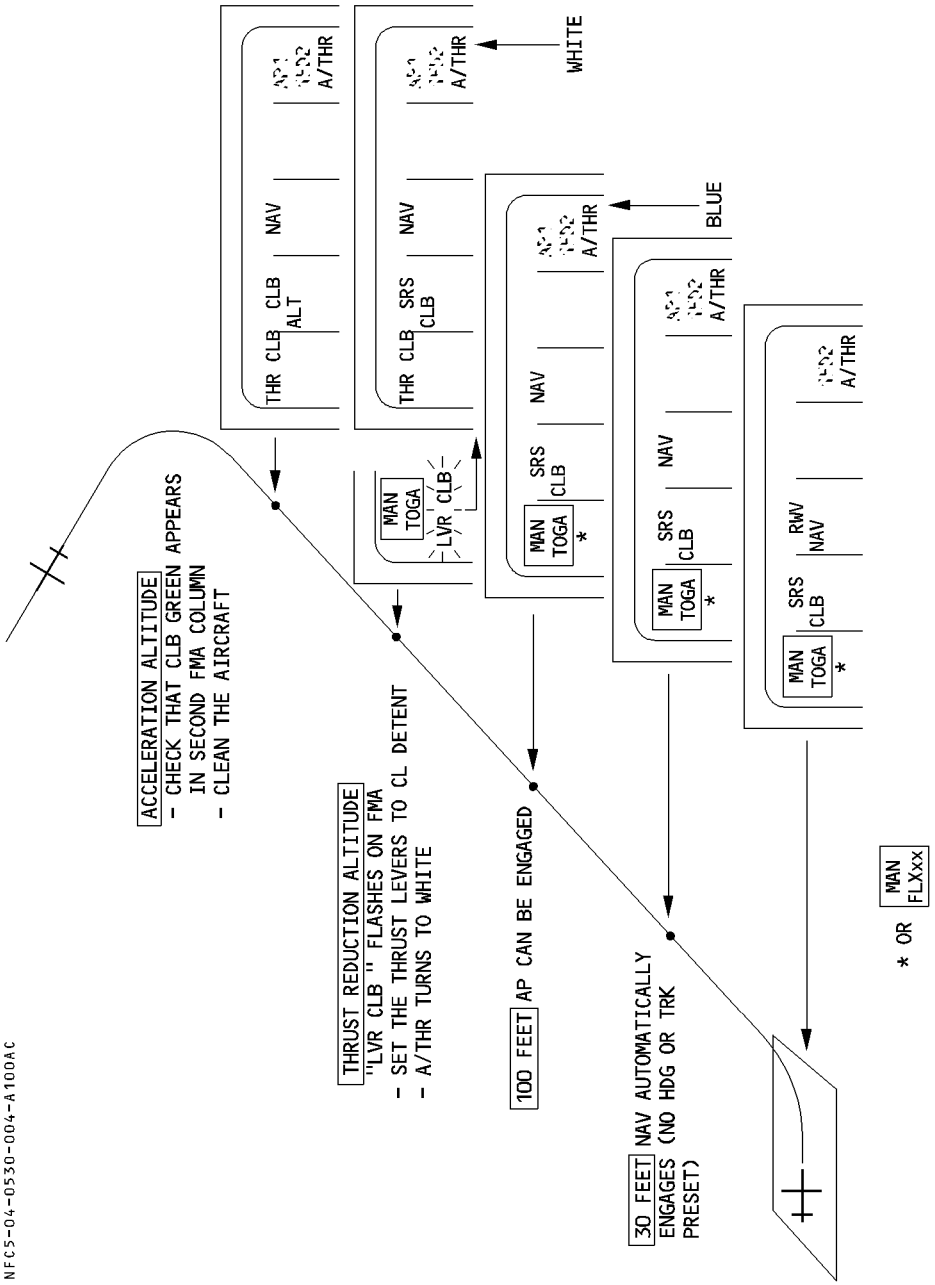
- **If a HDG or a TRK was preselected on the ground :**

– PULL OUT the HDG/TRK selector knob when required

– CHECK that the HDG/TRK mode is active and displayed on the FMA
When a HDG or TRK is preset, OP CLB mode will engage at the acceleration altitude. (CLB mode is not available in HDG/TRK mode).

R

NORMAL TAKEOFF PROFILE



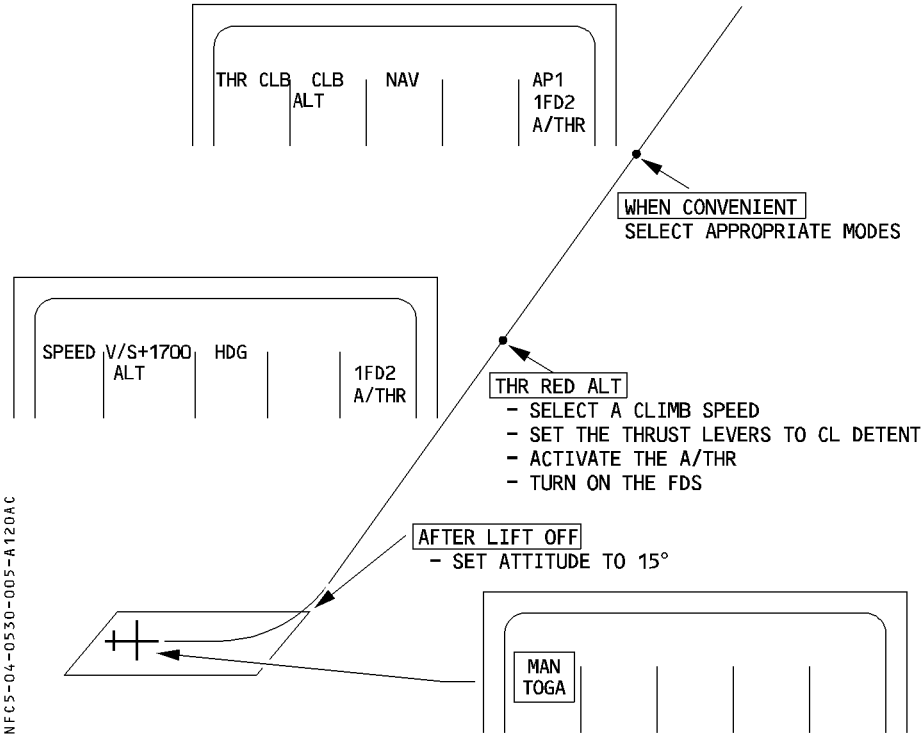
NO FLIGHT DIRECTOR TAKEOFF

If a takeoff is initiated without FDs, the system responds as follow :

- There are no FD bars.
- There is no A/THR arming.
- There is no guidance available.
- The target speed on the PFD is that selected on the FCU or is defaulted to 100 kt.
- Setting the thrust levers to the CL detent does not activate A/THR.

Note : Do not engage the autothrust prior to selecting a target speed on the FCU.

R



Procedure

– Establish initial climb of 15°

● When reaching the thrust reduction altitude (THR RED ALT) :

– SELECT a climb speed.

– SET the thrust levers to CL detent.

– ACTIVATE the autothrust.

– TURN ON the FDs (basic modes engage).

– SELECT appropriate mode.

– Failure of both FDs after the start of takeoff :
- The FD bars disappear.
- The FCU window displays the target speed, which synchronizes on V2, or the current speed (if it is higher).
- The autothrust remains armed.
- At thrust reduction altitude, LVR CLB flashes. If the pilot set the thrust levers to the CLB detent, the autothrust becomes active in selected SPD mode (no FDs selected). If the current speed is greater than the target speed, the thrust decreases.
- At acceleration altitude the target speed does not change, since it is selected.

TAKEOFF WITH NO V2 ENTRY

If V2 is not inserted, the speed reference system (SRS) will not engage for takeoff.
Five seconds after lift off, V/S mode will engage. When V/S engages the current airspeed becomes the FCU target speed.
To regain a normal speed target, the pilot must :

– SELECT the appropriate climb speed on the FCU and PULL out the knob.

● At ACC ALT :

– PUSH the A/THR pushbutton on the FCU.

– SET the thrust levers to CL detent.

– PUSH in the SPD selector knob to get a managed speed target.

TAKEOFF USING THE LOCALIZER OF THE OPPOSITE RUNWAY

If the localizer, of the ILS associated with the opposite runway, must be used for takeoff :

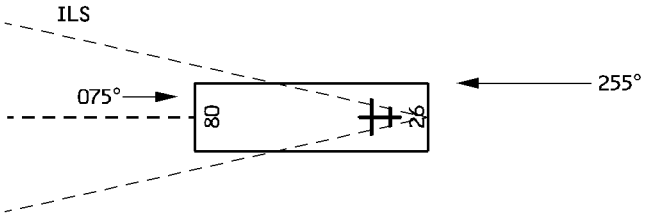
– **SELECT the RAD NAV PAGE.**

– **ENTER the ILS IDENT.**
If the ILS is in the database, the system tunes the proper frequency.
Check that the ILS front course is displayed in the CRS field.

Note : This may trigger the "RWY/ILS MISMATCH" message. Disregard it.

● **If the ILS is not in the database :**

– **SET the appropriate frequency, and SET the ILS front course in the CRS field.**



NFC5-04-0530-007-A001AA

ILS ON RUNWAY 08 (CRS = 075°)
BACK COURSE TAKEOFF ON RUNWAY 26
INSERT CRS = 075

– **DESELECT the ILS pushbutton on the FCU.**
Since the PFD displays reverse deviation.

– **SELECT ROSE ILS on one ND.**

TAKEOFF USING THE LOCALIZER OF THE OPPOSITE RUNWAY

If the localizer, of the ILS associated with the opposite runway, must be used for takeoff :

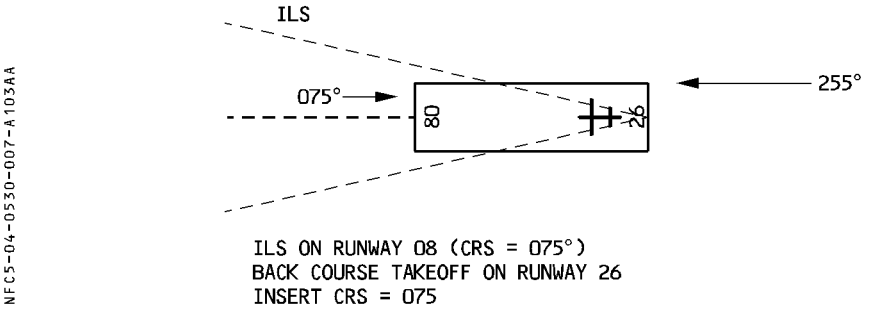
– **SELECT the RAD NAV PAGE.**

– **ENTER the ILS IDENT.**
If the ILS is in the database, the system tunes the proper frequency.
Check that the ILS front course is displayed in the CRS field.

Note : This may trigger the "RWY/ILS MISMATCH" message. Disregard it.

● **If the ILS is not in the database :**

– **SET the appropriate frequency, and SET the ILS front course in the CRS field.**



NFC5-04-0530-007-A103AA

– **DESELECT the LS pushbutton on the FCU.**
Since the PFD displays reverse deviation.

– **SELECT ROSE ILS on one ND.**

TAKEOFF USING THE LOCALIZER OF THE OPPOSITE RUNWAY

If the localizer, of the ILS associated with the opposite runway, must be used for takeoff :

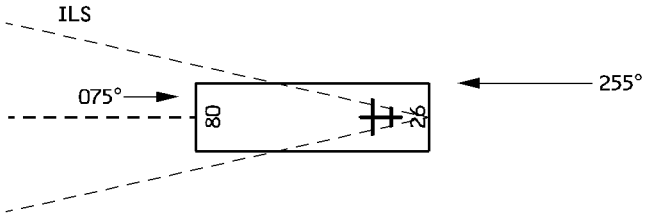
– **SELECT the RAD NAV PAGE.**

– **ENTER the ILS IDENT.**
If the ILS is in the database, the system tunes the proper frequency.
Check that the ILS front course is displayed in the CRS field.

Note : This may trigger the "RWY/ILS MISMATCH" message. Disregard it.

● **If the ILS is not in the database :**

– **SET the appropriate frequency, and SET the ILS front course in the CRS field.**



NFC5-04-0530-007-A200AA

ILS ON RUNWAY 08 (CRS = 075°)
BACK COURSE TAKEOFF ON RUNWAY 26
INSERT CRS = 075

– **DESELECT the LS pushbutton on the FCU.**
Since the PFD displays reverse deviation.

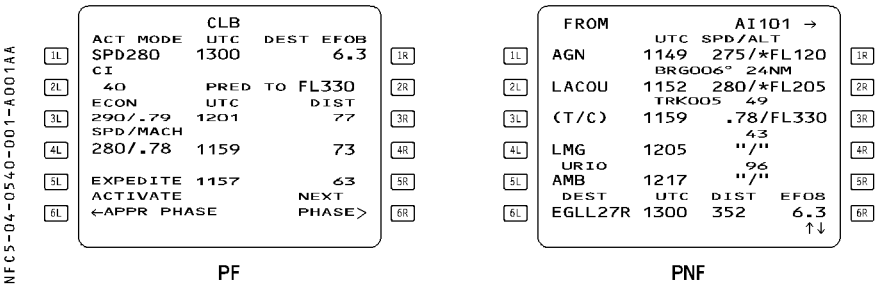
– **DESELECT the LS pushbutton on ISIS.**
Since ISIS displays the LOC reverse deviation.

– **SELECT ROSE ILS on one ND.**

MONITORING THE CLIMB PHASE

The PF MCDU should display the PERF CLB page allowing him to monitor the climb.

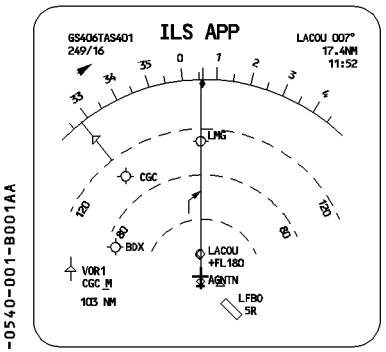
R The PNF MCDU should display the F-PLN page to allow the pilot to monitor time, speed and
R altitude predictions. This page also displays matched or missed information for constraints.
R



R — CHECK vertical mode CLB if NAV is engaged.
R — CHECK vertical mode OP CLB if HDG/TRK is engaged.

MONITORING THE ND (ROSE NAV or ARC)

Displays the lateral and vertical paths, in the current AP/FD active modes.



THE ↗ BLUE SYMBOL INDICATES WHERE THE FCU ALTITUDE WILL BE REACHED.

THE ↗ MAGENTA SYMBOL INDICATES WHERE THE NEXT F-PLN ALT CSTR WILL BE REACHED.

IF THE FCU ALTITUDE IS SET AT NEXT ALT CSTR, THE ↗ SYMBOL IS BLUE.

◯ SYMBOL AROUND WAYPOINT INDICATES AN ALTITUDE CONSTRAINT :

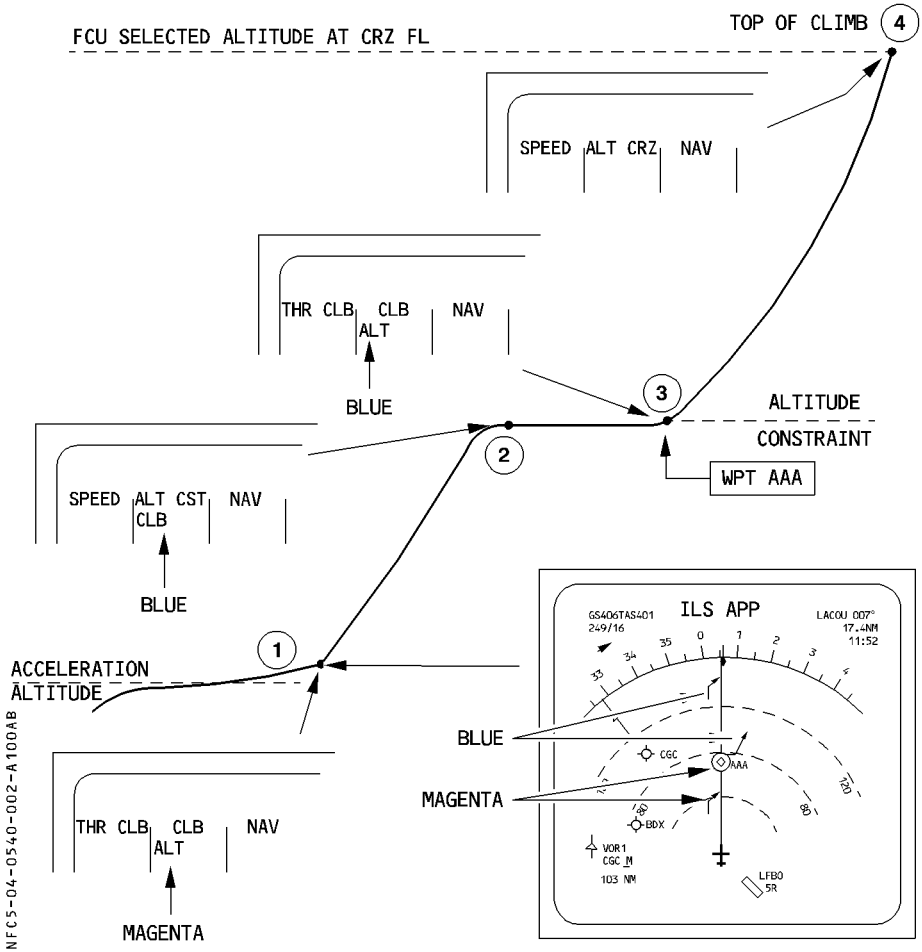
WHITE : DISREGARDED IN THE CURRENT AP/FD MODES
MAGENTA : PREDICTED AS MATCHED IN THE CURRENT MODES
AMBER : PREDICTED AS MISSED IN THE CURRENT MODES.

MONITORING THE AP/FD MODES and FMA

If CLB mode is engaged, the flight mode annunciator (FMA) and the navigation display (ND) show the tactical situation as follows :

CASE 1

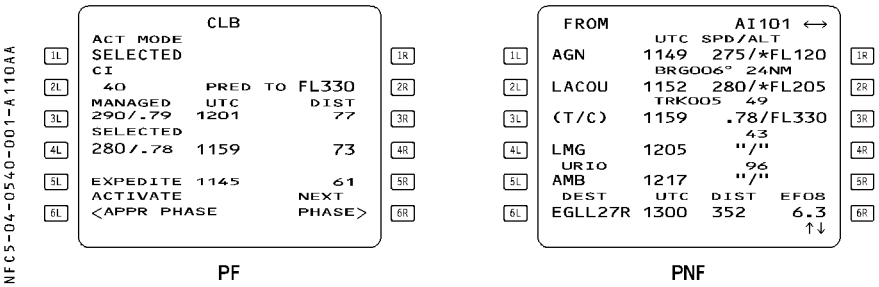
The FCU selected altitude is set above the next altitude constraint



MONITORING THE CLIMB PHASE

The PF MCDU should display the PERF CLB page allowing him to monitor the climb. The PNF MCDU should display the F-PLN page to allow the pilot to monitor time, speed and altitude predictions. This page also displays matched or missed information for constraints.

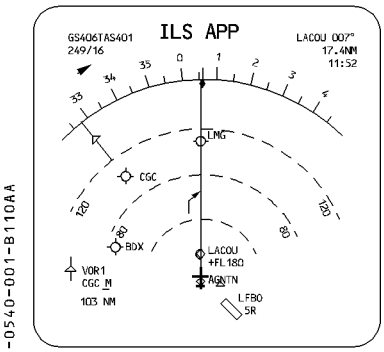
R



– CHECK vertical mode CLB if NAV is engaged.
– CHECK vertical mode OP CLB if HDG/TRK is engaged.

MONITORING THE ND (ROSE NAV or ARC)

Displays the lateral and vertical paths, in the current AP/FD active modes.



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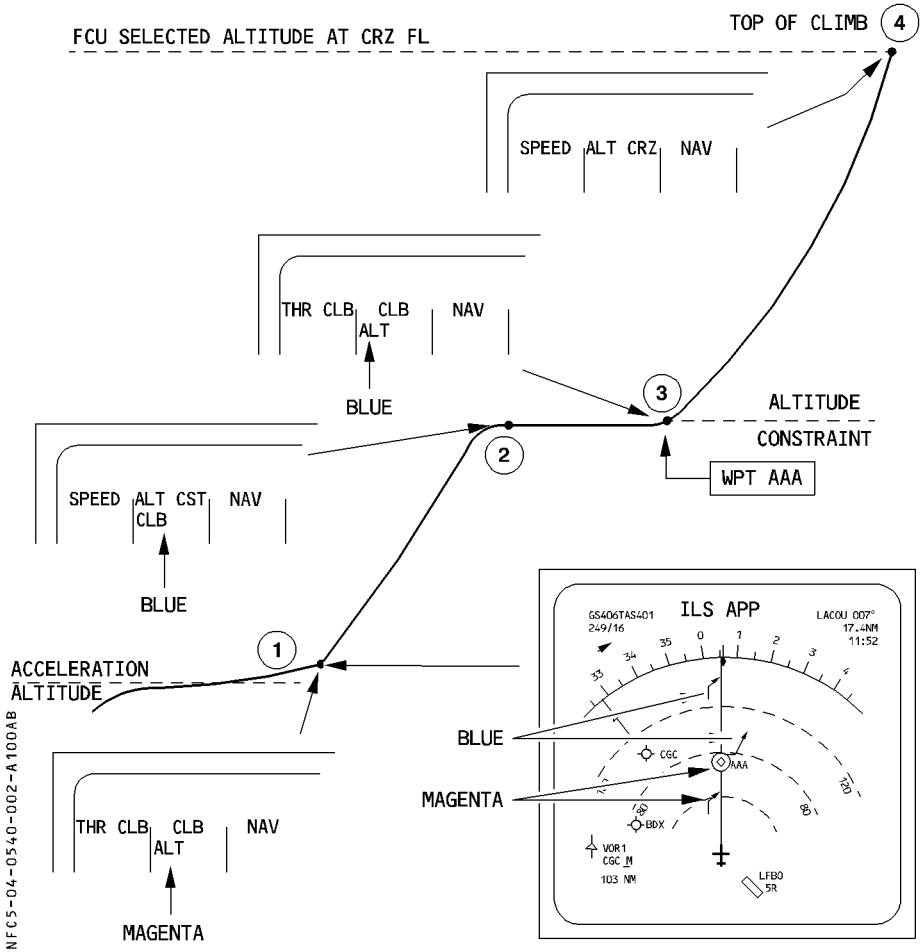
○ SYMBOL AROUND WAYPOINT INDICATES AN ALTITUDE CONSTRAINT :
WHITE : DISREGARDED IN THE CURRENT AP/FD MODES
MAGENTA : PREDICTED AS MATCHED IN THE CURRENT MODES
AMBER : PREDICTED AS MISSED IN THE CURRENT MODES.

MONITORING THE AP/FD MODES and FMA

If CLB mode is engaged, the flight mode annunciator (FMA) and the navigation display (ND) show the tactical situation as follows :

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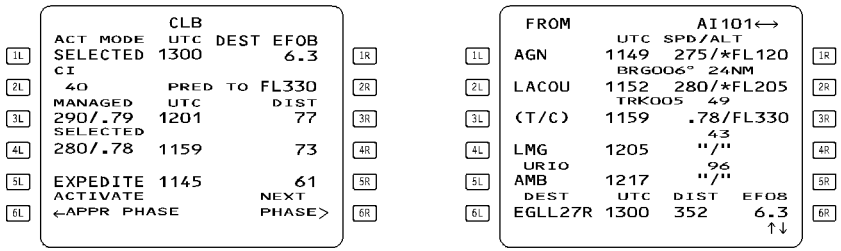
The FCU selected altitude is set above the next altitude constraint



MONITORING THE CLIMB PHASE

The PF MCDU should display the PERF CLB page allowing him to monitor the climb.
The PNF MCDU should display the F-PLN page to allow the pilot to monitor time, speed and altitude predictions. This page also displays matched or missed information for constraints.

NFCS-04-0540-001-A120AA



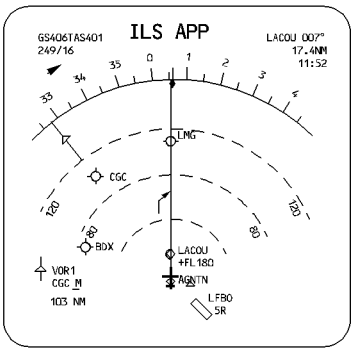
PF PNF

- CHECK vertical mode CLB if NAV is engaged.
- CHECK vertical mode OP CLB if HDG/TRK is engaged.

MONITORING THE ND (ROSE NAV or ARC)

Displays the lateral and vertical paths, in the current AP/FD active modes.

NFCS-04-0540-001-B120AA



THE ⌐→ BLUE SYMBOL INDICATES WHERE THE FCU ALTITUDE WILL BE REACHED.

THE ⌐→ MAGENTA SYMBOL INDICATES WHERE THE NEXT F-PLN ALT CSTR WILL BE REACHED.

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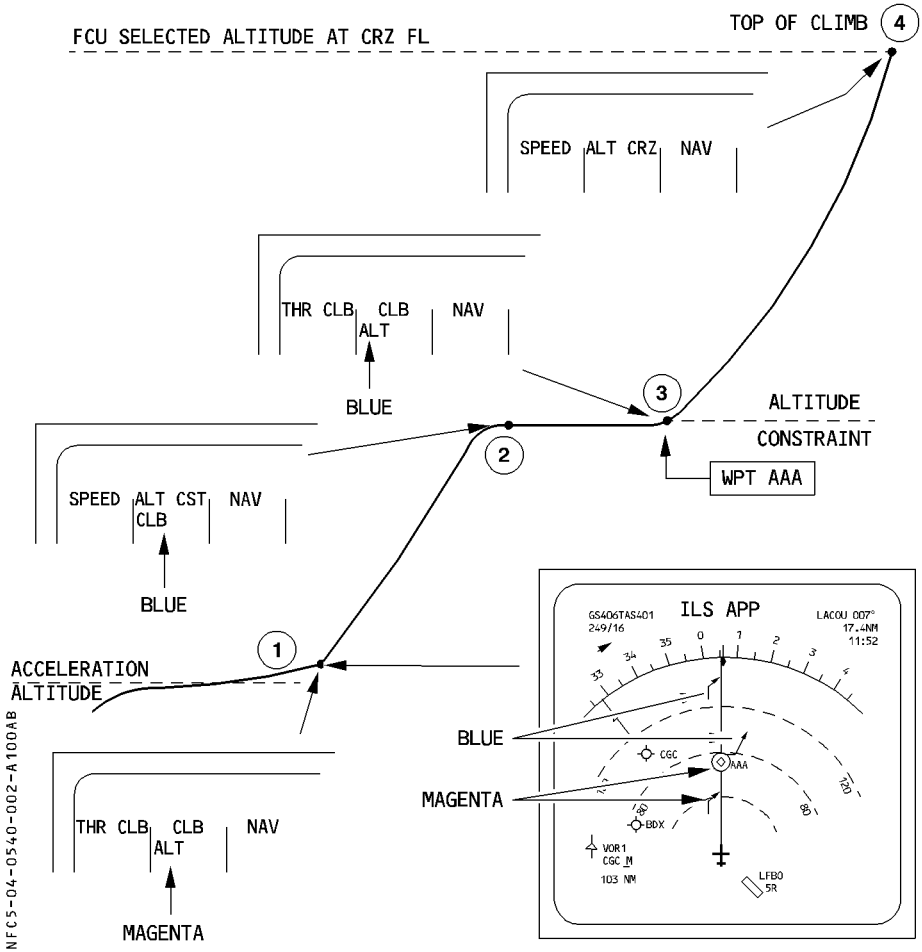
WHITE : DISREGARDED IN THE CURRENT AP/FD MODES
MAGENTA : PREDICTED AS MATCHED IN THE CURRENT MODES
AMBER : PREDICTED AS MISSED IN THE CURRENT MODES.

MONITORING THE AP/FD MODES and FMA

If CLB mode is engaged, the flight mode annunciator (FMA) and the navigation display (ND) show the tactical situation as follows :

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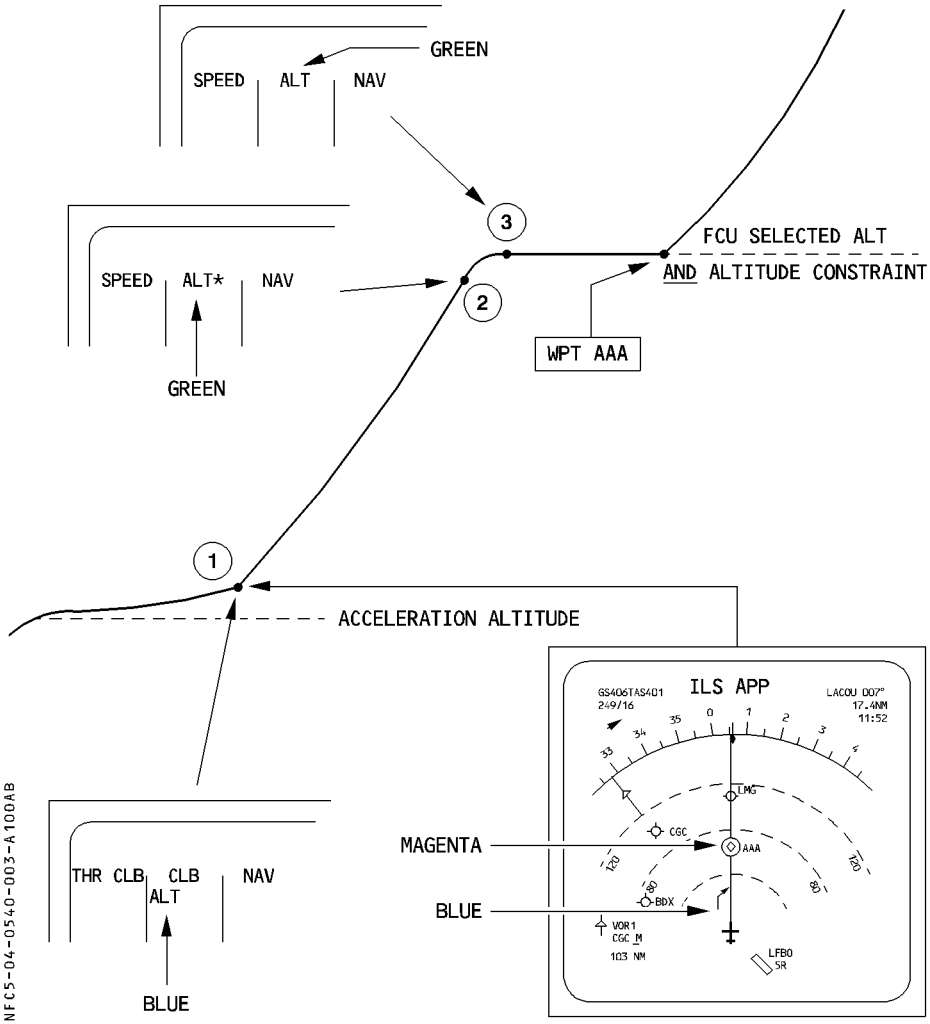
The FCU selected altitude is set above the next altitude constraint



CASE 2

The FCU selected altitude is set at the next altitude constraint

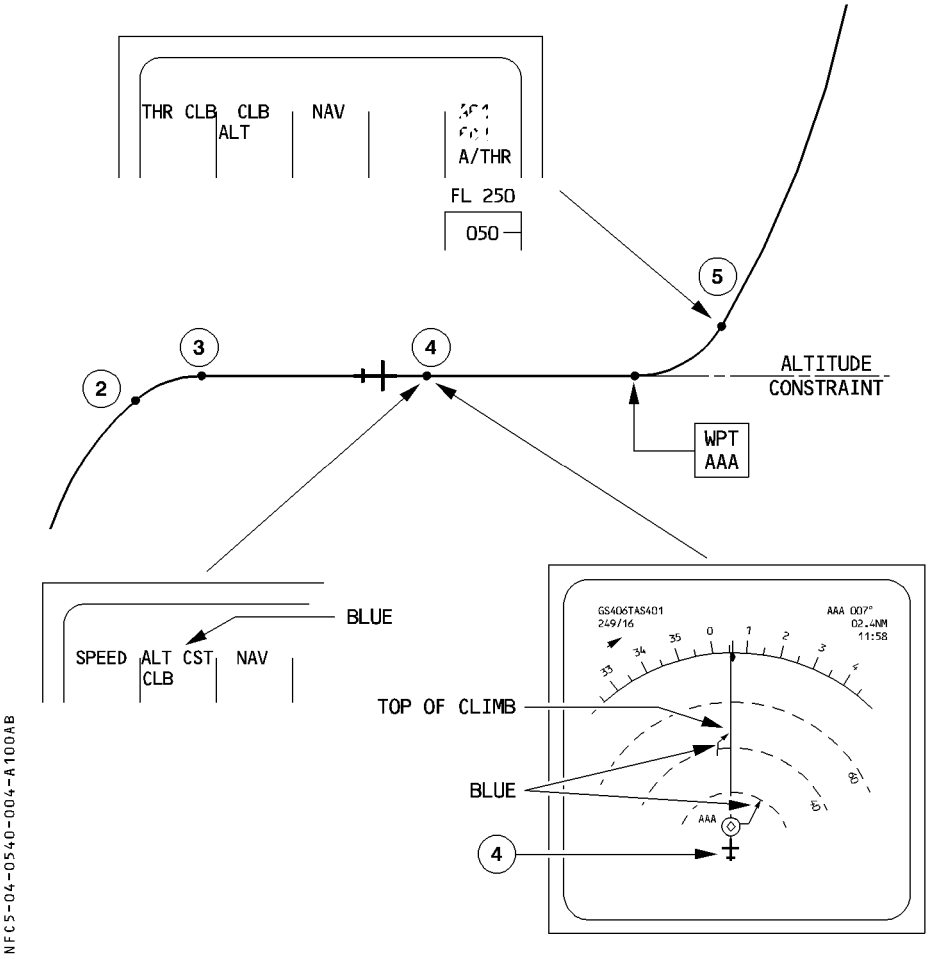
This aircraft will automatically levels off at this altitude.



To resume the climb automatically when the waypoint AAA is reached, apply the following procedure during the level off (Position 4) :

– SELECT the FCU altitude to the next constraint (if any) or the cruise FL.

– PUSH the FCU ALT selector knob to arm CLB mode.



Recommendation :

– To ensure that you will not miss the next constraint, it is recommended to select the FCU altitude to the next constraint as described above.

MONITORING THE CONSTRAINTS

SPEED, ALTITUDE and TIME constraint can be checked using MCDUs. Each constraint is preceded by a star that indicates if the constraint is matched (magenta star) or missed (amber star).

Altitude constraint

If an altitude constraint is predicted as missed, use the following procedure :

- **SET the FCU ALT to the next ALT CSTR**
- **CHECK the position of the level off symbol on the ND (blue arrow) with respect to the waypoint with the constraint.**
- **DECREASE the target speed until the constraint is met.**



Speed constraint

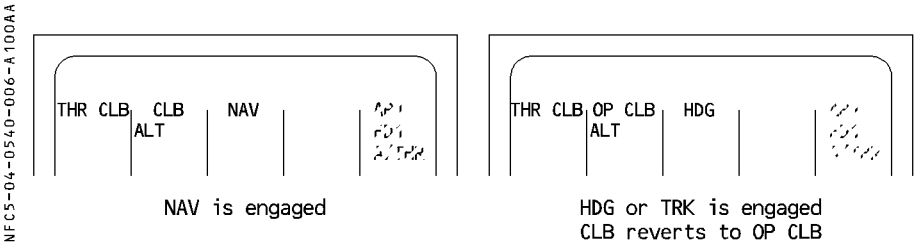
- **CHECK the SPD CSTR predictions on the MCDU.**
  - A magenta or amber star (*) indicates that the aircraft will match or miss the constraint.
    If the aircraft is to miss the constraint by more than 10 kt, the MCDU scratchpad displays "SPD ERROR AT WPT ---- ".

"CHECK GW" message.

Refer to 4.06.20. ABNORMAL PROCEDURES

HDG/TRK MODE ENGAGEMENT

If HDG/TRK is engaged, the guidance does not consider any F-PLN constraint. Therefore if the flight crew disengages NAV, CLB mode reverts to OP CLB.



SPEED SELECTION

If a specific speed is required :

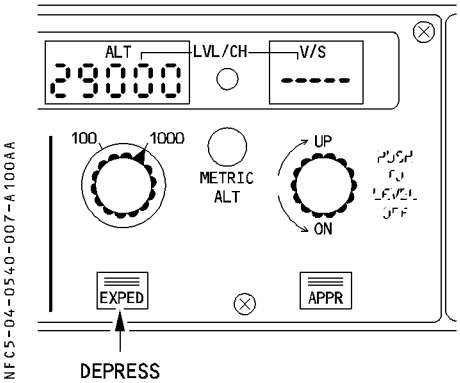
- TURN and PULL the SPD selector knob. (This changes the target speed to blue on the PFD speed scale).
- Predictions on the F-PLN page assume that the speed remains selected until the next SPD LIM or SPD CSTR, or the next phase, whichever comes first.

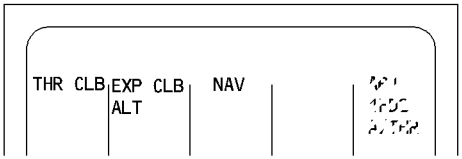
EXPEDITE CLIMB

The pilot may use the expedite mode Temporarily to clear a specified altitude or to match a constraint.

– PRESS EXPED push button on the FCU.

The AP acquires and maintains Green Dot speed. There is no benefit to use expedite mode above FL 250. The mach corresponding to green dot is too low to maintain an increased vertical speed.





FMA in EXPEDITE CLB

To revert to normal climb :
PUSH ALT selector knob, CLIMB mode will engage.

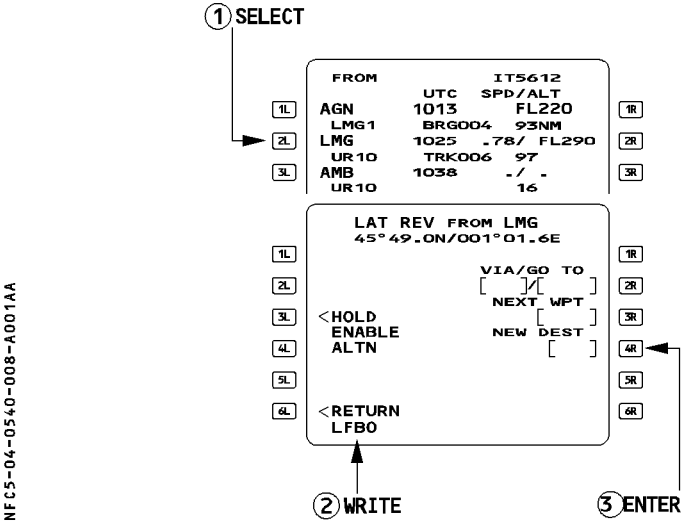
Note : Pulling ALT or V/S or SPD/MACH knob, also disengages EXPEDITE. PRESSING EXPED push button never disengages the mode.

IMMEDIATE RETURN TO ORIGIN AIRPORT

If the SEC F-PLN has been prepared for an immediate return to the airport of origin :

- **ACTIVATE the SEC F-PLN.**
- **PERFORM a DIR TO the appropriate waypoint.**

If no SEC F-PLN has been prepared for an immediate return to the airport of origin :



- **PERFORM a lateral revision at TO waypoint**

R – **ENTER the departure airport ident in the NEW DEST field and INSERT the**
R **temporary flight plan.**

- **PERFORM a lateral revision at the new destination**
- **SELECT : APPR – STAR – VIA – TRANS and INSERT**

● **When cleared to divert :**

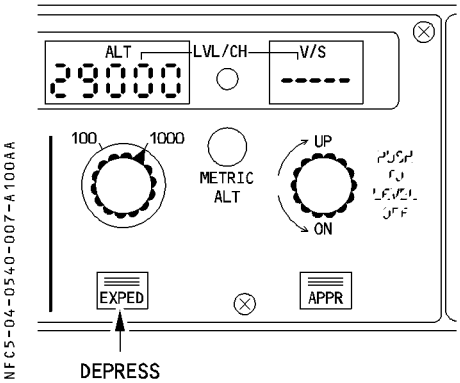
- **PERFORM a DIR TO the suitable waypoint.**
- **ENTER QNH, WIND, MDA/MDH, LDG CONF.**
- **CHECK RAD NAV page.**

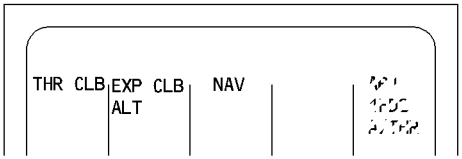
EXPEDITE CLIMB

The pilot may use the expedite mode Temporarily to clear a specified altitude or to match a constraint.

– PRESS EXPED push button on the FCU.

The AP acquires and maintains Green Dot speed. There is no benefit to use expedite mode above FL 250. The mach corresponding to green dot is too low to maintain an increased vertical speed.





FMA in EXPEDITE CLB

To revert to normal climb :
PUSH ALT selector knob, CLIMB mode will engage.

Note : Pulling ALT or V/S or SPD/MACH knob, also disengages EXPEDITE.
PRESSING EXPED push button never disengages the mode.

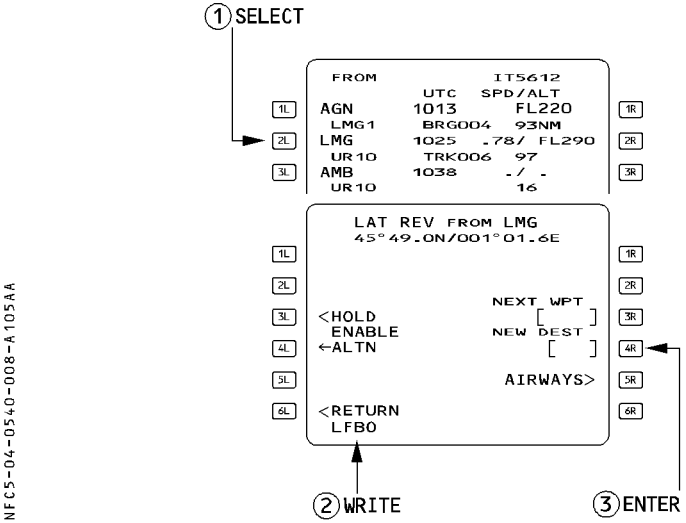
IMMEDIATE RETURN TO ORIGIN AIRPORT

If the SEC F-PLN has been prepared for an immediate return to the airport of origin :

– **ACTIVATE the SEC F-PLN.**

– **PERFORM a DIR TO the appropriate waypoint.**

If the SEC F-PLN has not been prepared for an immediate return to the airport of origin:



NFC5-04-0540-008-A105AA

– **PERFORM a lateral revision at TO waypoint**

– **ENTER the departure airport ident in the NEW DEST field and INSERT the temporary flight plan.**

– **PERFORM a lateral revision at the new destination**

– **SELECT : APPR – STAR – VIA – TRANS and INSERT**

- **When cleared to divert :**

  – **PERFORM a DIR TO the suitable waypoint.**

  – **ENTER QNH, WIND, MDA/MDH, LDG CONF.**

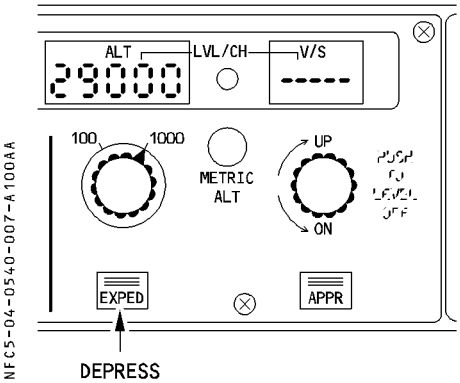
  – **CHECK RAD NAV page.**

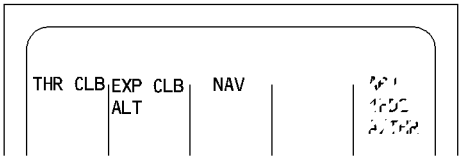
EXPEDITE CLIMB

The pilot may use the expedite mode Temporarily to clear a specified altitude or to match a constraint.

– PRESS EXPED push button on the FCU.

The AP acquires and maintains Green Dot speed. There is no benefit to use expedite mode above FL 250. The mach corresponding to green dot is too low to maintain an increased vertical speed.





FMA in EXPEDITE CLB

To revert to normal climb :
PUSH ALT selector knob, CLIMB mode will engage.

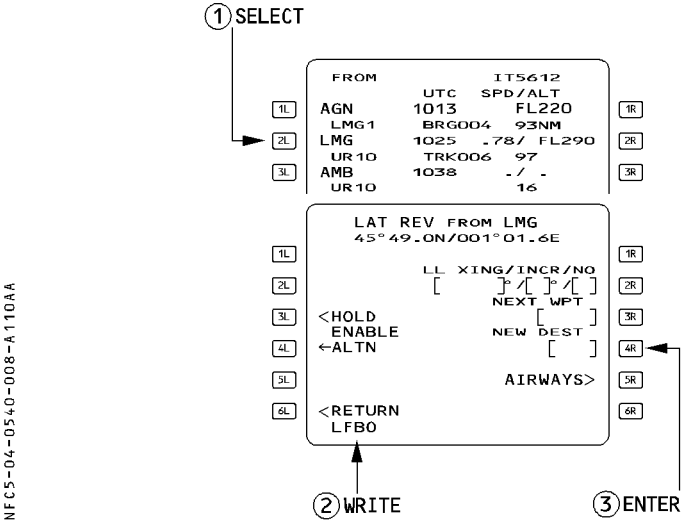
Note : Pulling ALT or V/S or SPD/MACH knob, also disengages EXPEDITE. PRESSING EXPED push button never disengages the mode.

IMMEDIATE RETURN TO ORIGIN AIRPORT

If the SEC F-PLN has been prepared for an immediate return to the airport of origin :

- **ACTIVATE the SEC F-PLN.**
- **PERFORM a DIR TO the appropriate waypoint.**

If the SEC F-PLN has not been prepared for an immediate return to the airport of origin:



- **PERFORM a lateral revision at TO waypoint**
- **ENTER the departure airport ident in the NEW DEST field and INSERT the temporary flight plan.**
- **PERFORM a lateral revision at the new destination**
- **SELECT : APPR – STAR – VIA – TRANS and INSERT**

● **When cleared to divert :**

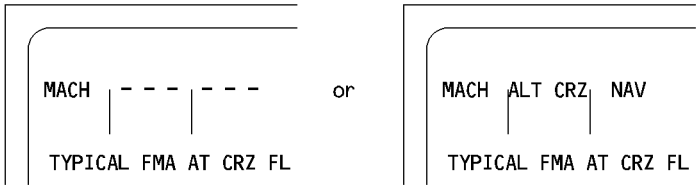
- **PERFORM a DIR TO the suitable waypoint.**
- **ENTER QNH, WIND, MDA/MDH, LDG CONF.**
- **CHECK RAD NAV page.**

REACHING CRUISE FLIGHT LEVEL

On reaching the cruise flight level, the flight crew should be sure that the FMA displays "ALT CRZ" or (——) in its second column, which ensures that the aircraft is at cruise flight level and at Economy Cruise Mach (ECON CRZ MACH).

R

NFC5-04-0550-001-A001AA



The FMGS engages the "soft altitude" (SOFT ALT) mode 2 minutes after the cruise flight level is captured and Mach stabilized. (SOFT ALT) mode allows the aircraft to deviate ± 50 feet from the target altitude to minimize the thrust variation and reduce the fuel consumption.
If the FMA does not display ALT CRZ or (——) at the assigned flight level, soft altitude mode will not engage and the predictions will be computed at the preplanned flight level. This will occur when the ATC assigned flight level is lower than the preplanned flight level entered on the PROG page.
If the FMA does not display ALT CRZ or (——) at the assigned FL (as may occur when the ATC-assigned FL is lower than the preplanned FL selected initially) :

- **PRESS the [PROG] key.**

- **ENTER the current cruise flight level.**

  Note : If the current cruise flight level is above the preplanned FL, selecting the FCU updates it automatically.

"SET SPD AUTO" (or "SET MANAGED SPD")

If the climb phase was flown in selected speed and if the cruise phase is planned to be flown in managed speed (ECON MACH/SPEED), "SET SPD AUTO" (or "SET MANAGED SPEED") appears on the PFD and MCDU as a reminder.

- **PRESS the FCU speed selector knob to activate the managed Mach.**

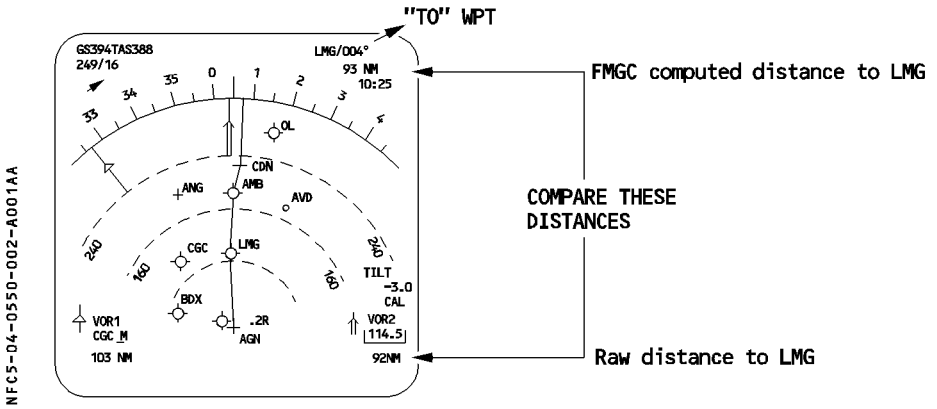
MONITORING THE NAVIGATION ACCURACY

On aircraft equipped with GPS PRIMARY, the navigation accuracy check is not required as long as GPS PRIMARY is available. ◁
Otherwise, navigation accuracy shall be checked periodically in cruise.
The PROG page displays an estimated accuracy as being high or low (center of sixth line). "HIGH" means that the FMGS estimates the FM position accurate enough to meet the EN ROUTE criteria.

– "LOW" means that the pilot must compare raw data from tuned navaids with corresponding data computed by FM and shown on the ND or MCDU PROG page. The appearance of the message "NAV ACCUR DOWNGRAD" on the MCDU calls for a similar crosscheck.

Note : The pilot should make such a comparison periodically, even if the PROG page is displaying "HIGH" and navaids are available : this allows him to quantify the FM position error.

The method for checking the accuracy is explained in the SOP and in 4.02.20.
A quick check is explained here below when the TO waypoint is a DME type. (VOR/DME or VOR/TAC or DME or TAC)



POSITION DISCREPANCY

If there is a discrepancy between the raw data position and the FM position :

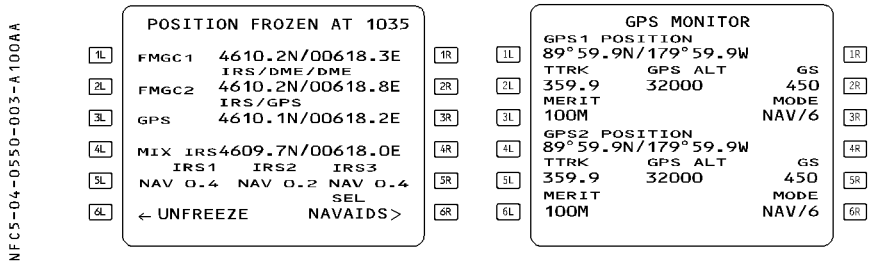
– PRESS the [DATA] key on the MCDU.

– SELECT the POSITION MONITOR page.

– SELECT "FREEZE".

On the other MCDU : Select the GPS MONITOR page.

R



NFC5-04-0550-003-A100AA

MONITORING THE PREDICTIONS

The F-PLN page and FUEL PRED page show fuel and time predictions. These predictions are meaningful if the flight plan and entered winds are accurate enough.

Procedure

– UPDATE the F-PLN to show accurate predictions.

– Periodically CHECK the wind on the F-PLN B page, and update it when the current wind is significantly different.

– Monitor the fuel by checking :
· Estimated fuel on board (EFOB) at destination (F-PLN page)
· EFOB at alternate and extra fuel (FUEL PRED page)

- **If the extra fuel is negative, modify successively the following data until the extra fuel becomes null or positive :**

– CHECK current cruise flight level versus the optimum level (OPT FL)
If advisable, REQUEST reassignment to the OPT FL (or OPT FL + 2000)

– Decrease the cost index down to zero if necessary (MIN FUEL)

– SELECT another ALTN on the ALTN page and CHECK whether or not XTRA FUEL becomes positive.

– Continue to check different alternates until you find one for which XTRA FUEL is null or positive.

- **When an alternate is not necessary, you may select "NO ALTN" option :**

– CHECK the required conditions (weather, runways, etc.) for NO ALTN.

– SELECT "NO ALTN" on the ALTN selection page.

– ADJUST FINAL TIME on the FUEL PRED page.

– CHECK XTRA FUEL.

POSITION DISCREPANCY

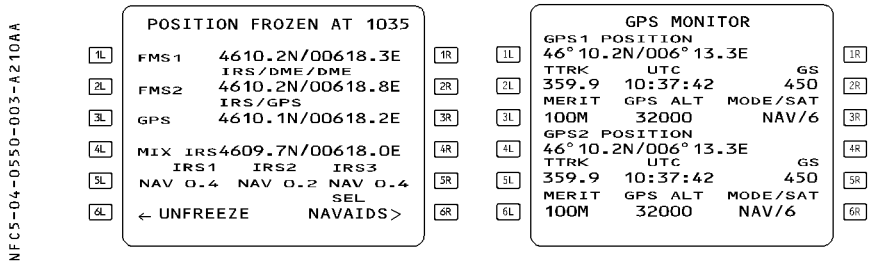
If there is a discrepancy between the raw data position and the FM position :

– PRESS the [DATA] key on the MCDU.

– SELECT the POSITION MONITOR page.

– SELECT "FREEZE".

On the other MCDU : Select the GPS MONITOR page.



MONITORING THE PREDICTIONS

The F-PLN page and FUEL PRED page show fuel and time predictions. These predictions are meaningful if the flight plan and entered winds are accurate enough.

Procedure

– UPDATE the F-PLN to show accurate predictions.

– Periodically CHECK the wind on the F-PLN B page, and update it when the current wind is significantly different.

– Monitor the fuel by checking :
· Estimated fuel on board (EFOB) at destination (F-PLN page)
· EFOB at alternate and extra fuel (FUEL PRED page)

- **If the extra fuel is negative, modify successively the following data until the extra fuel becomes null or positive :**

– CHECK current cruise flight level versus the optimum level (OPT FL)
If advisable, REQUEST reassignment to the OPT FL (or OPT FL + 2000)

– Decrease the cost index down to zero if necessary (MIN FUEL)

– SELECT another ALTN on the ALTN page and CHECK whether or not XTRA FUEL becomes positive.

– Continue to check different alternates until you find one for which XTRA FUEL is null or positive.

- **When an alternate is not necessary, you may select "NO ALTN" option :**

– CHECK the required conditions (weather, runways, etc.) for NO ALTN.

– SELECT "NO ALTN" on the ALTN selection page.

– ADJUST FINAL TIME on the FUEL PRED page.

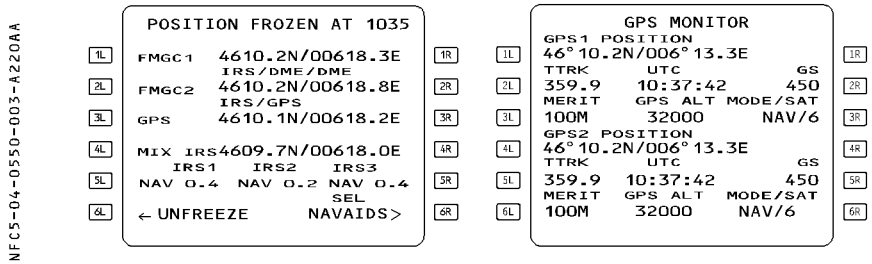
– CHECK XTRA FUEL.

POSITION DISCREPANCY

If there is a discrepancy between the raw data position and the FM position :

- **PRESS the [DATA] key on the MCDU.**
- **SELECT the POSITION MONITOR page.**
- **SELECT "FREEZE".**

On the other MCDU : Select the GPS MONITOR page.



MONITORING THE FUEL PREDICTIONS

The F-PLN and FUEL PRED pages display fuel and time predictions throughout the flight. These predictions are meaningful if the lateral and vertical flight plan, and the entered winds are accurate enough.

Procedure

In addition to the Fuel Management procedure described in the SOPs (refer to 3.03.15), periodically apply the following actions :

- **KEEP ACCURATE FMS PREDICTIONS**
  Periodically UPDATE the F-PLN elements (F-PLN waypoints, step altitudes, predicted winds).

- **CHECK/MODIFY the MIN DEST FOB value on the FUEL PRED page**
  At the beginning of the CRZ phase, and/or after any change of destination or alternate airport, CHECK/MODIFY the MIN DEST FOB value on the FUEL PRED page. Check that the displayed MIN DEST FOB value corresponds to the required minimum fuel at destination, or enter the required value in the [5R] field.

- **CHECK the DEST EFOB value on the F-PLN or FUEL PRED page**
  MONITOR the EFOB at destination on the F-PLN or FUEL PRED page. If necessary, ADAPT the flight strategy.

  Note : The crew should keep in mind that the MIN DEST FOB function and the FMS-computed EXTRA fuel are based on different hypothesis :
  - *The EXTRA fuel computation may take into account the RTE RSV (according to the AMI configuration)*
  - *The EXTRA fuel takes into account the FMS-estimated ALTN fuel (which may be inaccurate, due to the computation hypothesis, such as wind model, performance...).*

  As a consequence, the EXTRA fuel predicted by the FMS, as well as the "LAST EXIT" time/fuel information displayed on the HOLD page, may not be compatible with the MIN DEST FOB specified by the crew.

"DEST EFOB BELOW MIN" MESSAGE

If the predicted EFOB at destination becomes less than the MIN DEST FOB value displayed on the FUEL PRED page :

- The destination EFOB turns to amber on the F-PLN, FUEL PRED and PERF (CLB, CRZ, DES) pages,
- The "DEST EFOB BELOW MIN" amber message is displayed on the MCDU scratchpad, after 2 minutes (if the FMS is in CRZ or DES phase).

Procedure

- **If the "DEST EFOB BELOW MIN" message is triggered on the MCDU :**

  - **CHECK the DEST EFOB value on the F-PLN or FUEL PRED page,**

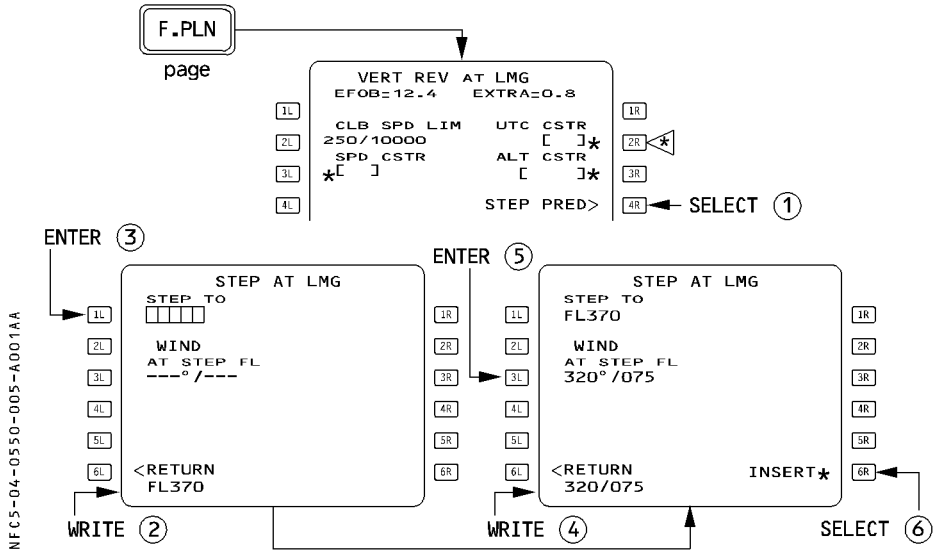
  - **CHECK the hypothesis used by the FMS to compute the fuel predictions,**
    Check that the F-PLN elements (F-PLN waypoints, step altitudes, predicted winds) are up-to-date, to ensure that the FMS predictions are accurate.

  - **CHECK the MIN DEST FOB value on the FUEL PRED page,**

  - **ADAPT the flight strategy as required.**

ENTERING A STEP CLIMB OR A STEP DESCENT

The flight crew can use the STEP PREDICTION page to enter one step climb or one step descent at any waypoint of the cruise phase except the "FROM" waypoint.

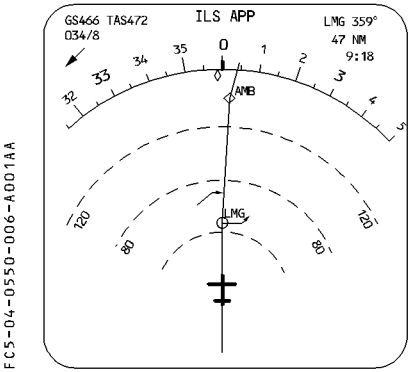


Procedure

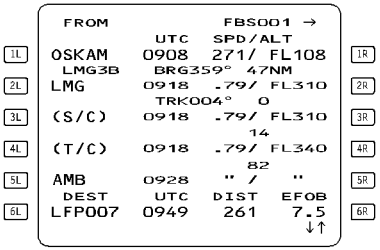
- **PRESS the F-PLN key.**
- **SELECT "VERT REV" at the waypoint where you want to climb.**
- **WRITE a step altitude into the scratchpad and ENTER it.**
- **WRITE a wind (if it is significantly different from the initial cruise-flight-level wind) into the scratchpad and ENTER it.**
- **INSERT the step.**
- **CHECK the predictions.**

The FM uses the step climb or the step descent to recompute the predictions.
The ND shows symbols for the start of climb or descent and the top of climb or bottom of descent. The MCDU shows associated pseudo waypoints.
The step automatically revises the cruise flight level.
The flight crew must initiate the climb or the descent by pulling out or pushing the altitude selector knob. CLB or OP CLB will engage in climb, DES or OP DES in descent. DES mode engages with a constant vertical speed of – 1000 ft/min.

If the aircraft passes the step waypoint without beginning a climb or a descent, the system deletes the step from the vertical F-PLN automatically ("STEP DELETED" appears) and recomputes the predictions.
The system will not accept a step climb or descent if it does not ensure at least one minute of flight time at the new altitude.



NFCS-04-0550-006-A001AA



If no step wind is entered, the wind used at the new CRZ FL is automatically defaulted to the wind at the previous flight level.

ENTERING A STEP CLIMB OR A STEP DESCENT

The flight crew may use the STEP ALT page to enter up to four geographic step points or one optimal step (computed by the FM) at any waypoint of the cruise.

Procedure

– **PRESS the PERF key.**

– **SELECT "STEP ALTS" prompt.**
The PERF PAGE displays this prompt in cruise phase. The flight crew may also select the STEP ALTS page using a vertical revision at a cruise waypoint.

Entering an OPTIMAL STEP (only step climbs)

– **WRITE a step altitude or FL into the scratchpad.**

– **ENTER the step altitude or FL in the [1R] field.**

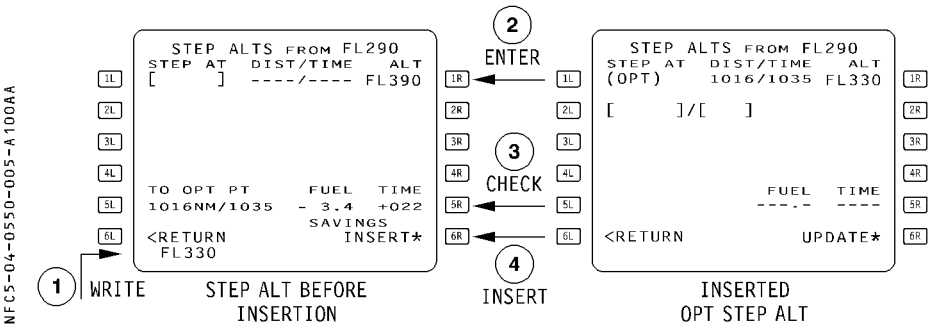
– **CHECK the FUEL and TIME SAVINGS and predictions on the 5L and 5R fields.**

– **PUSH the INSERT prompt [6R] if adequate**
After insertion, the optimum step climb is updated only when the flight crew presses the UPDATE prompt [6R].
The ND shows symbols for the start of climb and the top of climb. The MCDU shows associated pseudo waypoints.
It is possible to convert an optimum step to a geographic step by overwriting the [1L] field (see geographic step).

- **When reaching the step climb pseudo waypoint :**

– **REQUEST climb clearance**

– **ADJUST the FCU altitude to the STEP ALT, and PUSH.**



NFC5-04-0550-005-A100AA

Entering a GEOGRAPHIC STEP

– WRITE a step altitude into the scratchpad

The format is position/altitude (or FL). The position can be a waypoint or waypoint/distance to waypoint. The waypoint/distance is an along track offset waypoint.

– ENTER it in [1L] to [4L] field

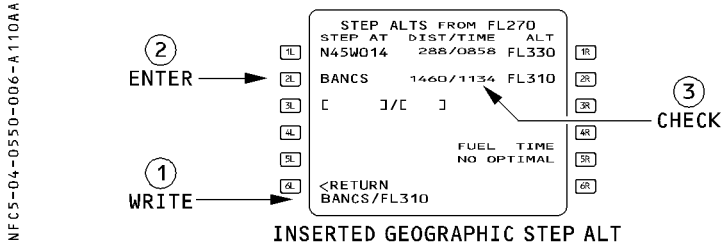
The entry of the initial geographic step point requires both a valid waypoint and altitude entries. When a step has been entered, the flight crew may change the position and the altitude independently. The flight crew cannot modify the position and the altitude in a single entry : To modify both, they should modify the position first, and then the altitude.

– CHECK the predictions

● **When reaching the step climb or descent pseudo waypoint :**

– REQUEST climb or descent clearance

– ADJUST the FCU altitude to the STEP ALT, and PUSH.



INSERTED GEOGRAPHIC STEP ALT

The DIST/TIME field may display the following messages :

– ABOVE MAX if the step altitude exceeds the MAX ALT

R – IGNORED if the step endpoint is less than 50 NM from the top of descent.

– STEP NOW when the aircraft is within 20 NM of the step point.

If the aircraft passes the step waypoint without starting a climb or a descent, the system deletes the step from the vertical F-PLN automatically ("STEP DELETED" appears) and recomputes the predictions.

A step is not deleted if the FCU altitude is moved only partially towards the step altitude.

The flight phase remains at cruise when a step is initiated.

Note : For an altitude restriction defined at a waypoint less than 50 NM, before the top of descent and lower than the CRZ FL, it is recommended that the flight crew enter an altitude constraint, rather than a step.

ENTERING A STEP CLIMB OR A STEP DESCENT

The crew may use the STEP ALTS page to enter up to four geographic step points or one optimal step (computed by the FMGS) at any waypoint of the cruise.

Procedure

– **PRESS the PERF key.**

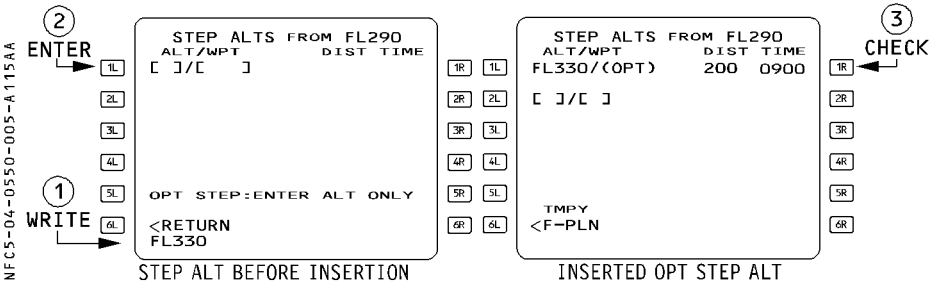
– **SELECT "STEP ALTS" prompt.**
The PERF PAGE displays this prompt in cruise phase. The crew may also call up the STEP ALTS page using a vertical revision at any cruise waypoint.

Entering an OPTIMAL STEP (only STEP CLIMB)

– **WRITE the desired step altitude into the scratchpad.**

– **ENTER it in the [1L] field**
The FMGS automatically computes the optimal location of the step and inserts it in the TMPY F-PLN.

– **CHECK the FUEL and TIME SAVINGS predictions on the [6R].**
After insertion, the optimum step location is regularly updated, until the aircraft is within 20 NM of the step point.
The ND shows symbols for the start of climb (S/C) and the top of climb (T/C). The MCDU shows the associated pseudo-waypoints.
It is possible to convert an optimum step to a geographic step by overwriting the [1L] field (see geographic step).



● **When reaching the step climb pseudo-waypoint (S/C) :**

– **REQUEST climb clearance**

– **ADJUST the FCU altitude to the STEP ALT, and PUSH the FCU knob.**

Entering a GEOGRAPHIC STEP (STEP CLIMB or STEP DESCENT)

– WRITE a step altitude and waypoint into the scratchpad.
The format is :
· Altitude (or FL)/waypoint (Ex : FL350/BERAD)
· Altitude (or FL)/waypoint/distance (Ex : FL350/BERAD/-20)
The waypoint must be in the flight plan.

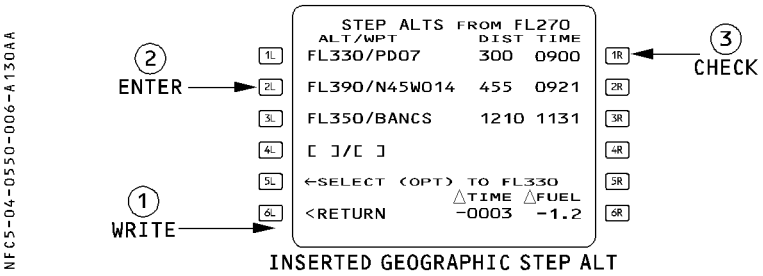
– ENTER it in [1L] to [4L] field.
It is possible to independently modify either the location or the altitude of an existing step altitude. It is not possible to modify with a single entry both the location and the altitude : An entry "waypoint/xxx" will be taken by the system as an along track offset of xxx nautical miles.

– CHECK the predictions (distance, time).

● **When reaching the step climb or descent pseudo-waypoint (S/C or S/D):**

– REQUEST climb or descent clearance.

– ADJUST the FCU altitude to the STEP ALT, and PUSH the FCU knob.



NFC5-04-0550-006-A130AA

INSERTED GEOGRAPHIC STEP ALT

The DIST/TIME field may display the following messages :
– ABOVE MAX if the step altitude exceeds the MAX ALT.
– IGNORED if the start step point is less than 50 NM from the top of descent.
– STEP AHEAD when the aircraft is within 20 NM of the step point.
If the aircraft overflies the step pseudo-waypoint without commencing a climb or a descent, the system deletes the step from the vertical F-PLN automatically (a "STEP DELETED" message is displayed on the MCDU scratchpad), and recomputes the predictions.
The step is not deleted if the FCU altitude is moved only partially towards the step altitude. The flight phase remains "cruise" whenever a step is initiated.

Note : For an altitude restriction defined at a waypoint less than 50 NM before the top of descent and lower than the CRZ FL, it is recommended to enter an altitude constraint rather than a step.

IMMEDIATE CHANGE OF LEVEL IN CRUISE

When the pilot changes his flight level without inserting a step :

- If the FCU-selected altitude is above the previous CRZ FL, the CRZ FL on the PROG page changes to the new flight level.
- If the FCU-selected altitude is lower than the previous CRZ FL and if the distance to DEST is more than 200 NM, the CRZ FL on the PROG page changes.
  In that case Mach target is managed as follows :
  - At the start of the descent, the Mach target is the managed Mach number at the initial cruise flight level.
  - When the aircraft reaches the new flight level, the Mach target switches either to the Mach number for the lower CRZ FL, or to the speed for the lower CRZ FL if the aircraft reaches the crossover altitude. This logic prevents the aircraft from exceeding Vmo during descent.
- If the FCU-selected altitude is lower than the previous CRZ FL and the aircraft is within 200 NM of its destination, the system activates the descent phase.
  The pilot may reactivate the cruise phase by entering a new cruise flight level in the PROG page.

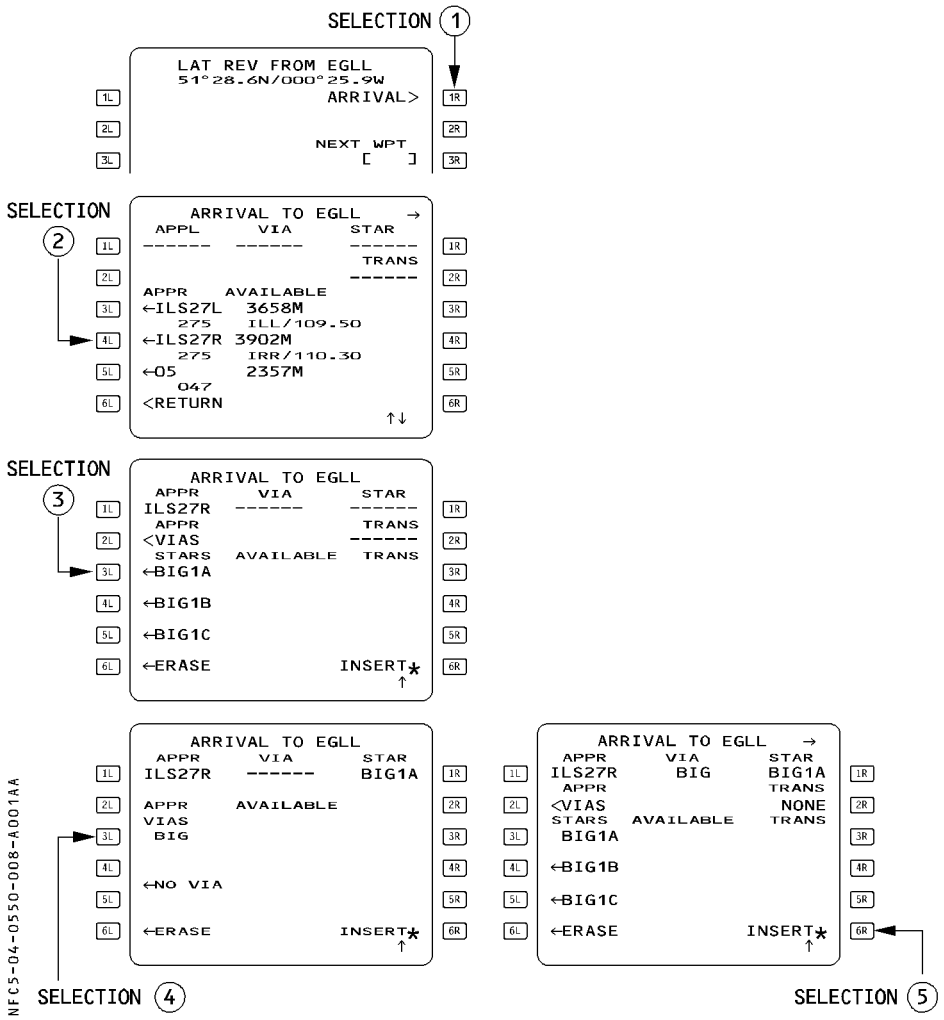
PREPARATION FOR DESCENT AND APPROACH

The preparation for descent and approach consists of :

- Entering PERF and WIND data
- Defining the lateral and vertical F-PLN
- Checking the tuning (auto or manual) of the appropriate navaids

After receiving the arrival information, the flight crew should use the following procedure.

REVISION OF LATERAL F-PLN



IMMEDIATE CHANGE OF LEVEL IN CRUISE

When the pilot changes his flight level without inserting a step :

- If the FCU-selected altitude is above the previous CRZ FL, the CRZ FL on the PROG page changes to the new flight level.
- If the FCU-selected altitude is lower than the previous CRZ FL and if the distance to DEST is more than 200 NM, the CRZ FL on the PROG page changes.
  In that case Mach target is managed as follows :
  - At the start of the descent, the Mach target is the managed Mach number at the initial cruise flight level.
  - When the aircraft reaches the new flight level, the Mach target switches either to the Mach number for the lower CRZ FL, or to the speed for the lower CRZ FL if the aircraft reaches the crossover altitude. This logic prevents the aircraft from exceeding Vmo during descent.
- If the FCU-selected altitude is lower than the previous CRZ FL and the aircraft is within 200 NM of its destination, the system activates the descent phase.
  The pilot may reactivate the cruise phase by entering a new cruise flight level in the PROG page.

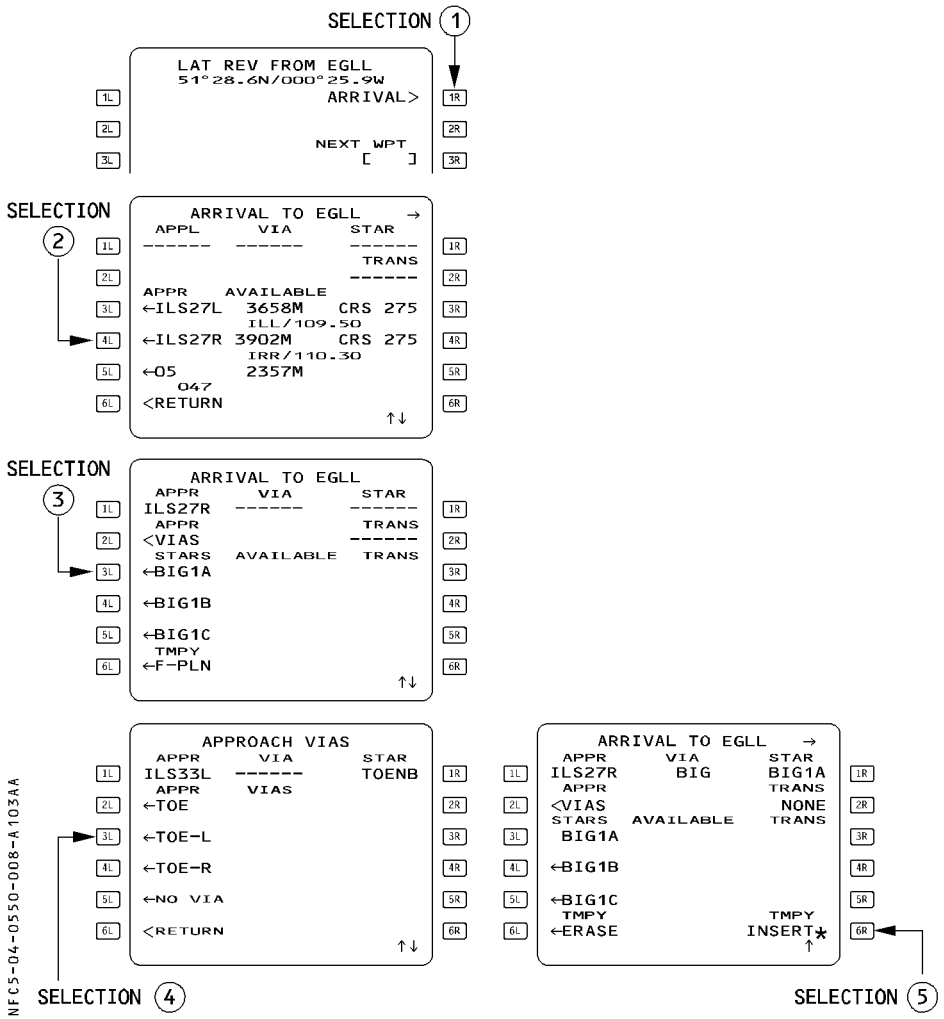
PREPARATION FOR DESCENT AND APPROACH

The preparation for descent and approach consists of :

- Entering PERF and WIND data
- Defining the lateral and vertical F-PLN
- Checking the tuning (auto or manual) of the appropriate navaids

After receiving the arrival information, the flight crew should use the following procedure.

REVISION OF LATERAL F-PLN



– PERFORM a lateral revision at destination

– SELECT an ARRIVAL

– SELECT an APPROACH, a STAR, a TRANSITION, a VIA.
When the pilot selects successive items, the page are automatically sequenced. But pressing NEXT PAGE key brings up the APPR and STAR page successively.

– CHECK the temporary revision including the missed approach.

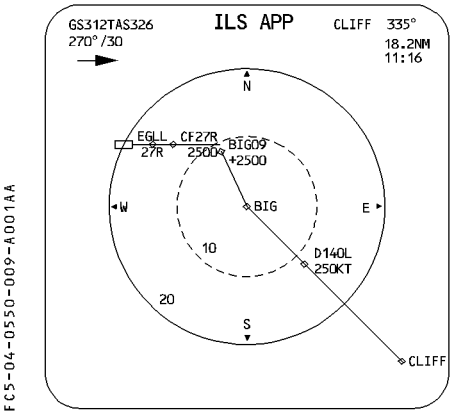
– INSERT the temporary revision, [6R] key.

REVISION OF VERTICAL FLIGHT PLAN

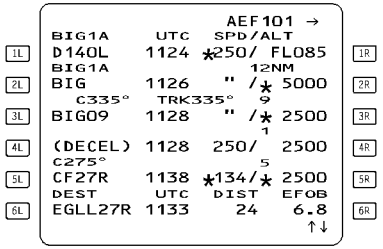
– CHECK the speed and altitude constraints as displayed on the ND. (Use the CSTR pusbutton).

– ENTER any additional speed or altitude constraints using the vertical revision page.
In order not to be too fast when commencing approach, you may insert a speed constraint at the FAF (Final Approach Fix).
When all computations are completed.

– REVIEW the flight plan using the approach chart.
When the destination runway changes and if the previously selected STAR is compatible with the new runway, the system selects it automatically in the temporary F-PLN. If the flight crew has entered any revision or constraint on this STAR, it will not be transferred. The pilot must reenter it in order to retain it for this approach.



NFC5-04-0550-009-A001AA

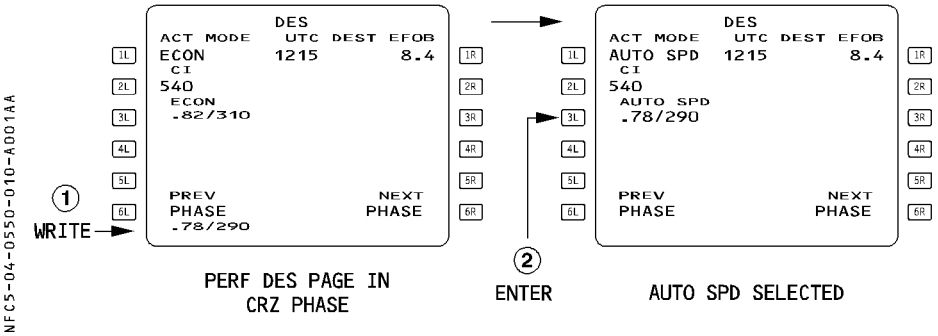


ENTERING THE WINDS FOR DESCENT

Refer to 4.04.20.

ENTERING AN AUTO SPEED

As long as descent phase is not active, the PERF DES page may be used to select either a speed or a Mach number or both to replace the optimum descent speed. This speed is the called Auto speed.
The Flight Guidance Computer then uses your Auto speed instead of the ECON Speed for computing the descent profile and determining the Descent Managed Speed profile.
When the system switches to the descent phase, it sets the managed target speed to the auto speed. From there, you may modify the speed by using the FCU selector knob only.
R Once in descent phase, the pilot cannot select the ECON speed again.



Procedure

- **PRESS the PERF key on MCDU**
- **SELECT "NEXT PHASE" prompt**
- **WRITE the speed for the descent into the scratchpad and ENTER it**
  The field 3L displays AUTO SPD value.

– PERFORM a lateral revision at destination

– SELECT an ARRIVAL

– SELECT an APPROACH, a STAR, a TRANSITION, a VIA.
When the pilot selects successive items, the page are automatically sequenced. But pressing NEXT PAGE key brings up the APPR and STAR page successively.

– CHECK the temporary revision including the missed approach.

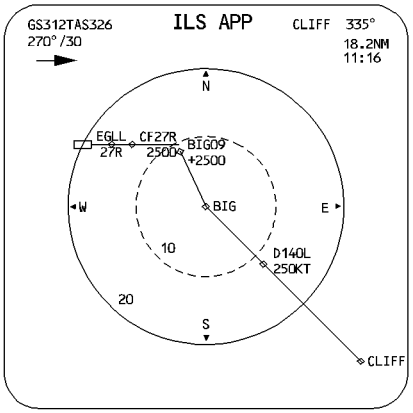
– INSERT the temporary revision, [6R] key.

REVISION OF VERTICAL FLIGHT PLAN

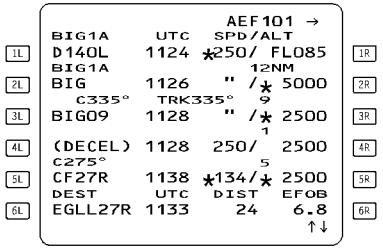
– CHECK the speed and altitude constraints as displayed on the ND. (Use the CSTR pusbutton).

– ENTER any additional speed or altitude constraints using the vertical revision page.
In order not to be too fast when commencing approach, you may insert a speed constraint at the FAF (Final Approach Fix).
When all computations are completed.

– REVIEW the flight plan using the approach chart.
When the destination runway changes and if the previously selected STAR is compatible with the new runway, the system selects it automatically in the temporary F-PLN. If the flight crew has entered any revision or constraint on this STAR, it will not be transferred. The pilot must reenter it in order to retain it for this approach.



NFC5-04-0550-009-A001AA

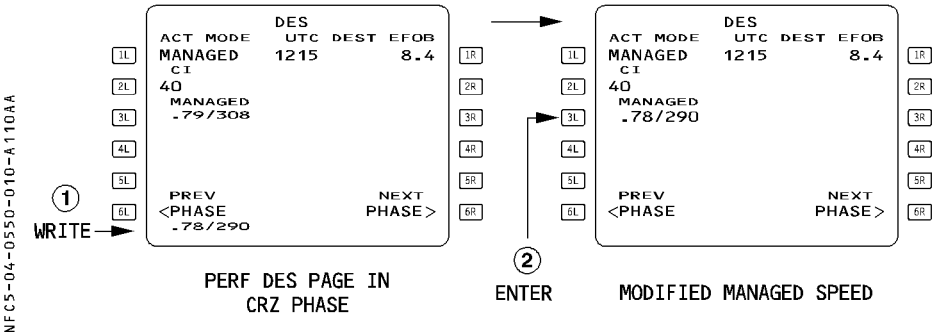


ENTERING THE WINDS FOR DESCENT

Refer to 4.04.25.

PRESELECTING A MANAGED SPEED/MACH

As long as the descent phase is not active, the PERF DES page may either be used to select a speed, or a Mach number, or both, to replace the optimum descent speed.
The Flight Guidance Computer then uses the entered speed, instead of the optimum speed for computing the descent profile.
When the system switches to the descent phase, it sets the MANAGED target speed to the entered speed. From there, the speed may only be modified by using the FCU selector knob.
Once in descent phase, the pilot cannot modify the MANAGED speed again.



Procedure

- **PRESS the PERF key on the MCDU.**
- **SELECT the "NEXT PHASE" prompt.**
- **WRITE the descent speed into the scratchpad and ENTER it.**
  The 3L field displays the imposed managed speed value.

– PERFORM a lateral revision at destination.

– SELECT an ARRIVAL.

– SELECT an APPROACH, a STAR, a TRANSITION, a VIA.

When the pilot selects successive items, the pages are automatically sequenced. But, pressing "NEXT PAGE" key brings up the APPR and STAR page successively.

– CHECK the temporary revision, including the missed approach.

– INSERT the temporary revision, [6R] key.

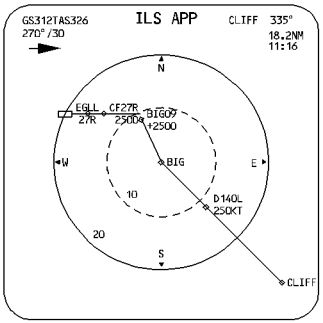
REVISION OF VERTICAL FLIGHT PLAN

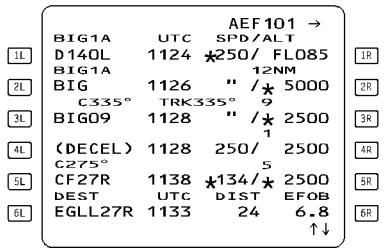
– CHECK that the speed and altitude constraints as displayed on the ND. (Use the CSTR pushbutton).

– ENTER any additional speed or altitude constraints using the vertical revision page.
In order not to be too fast when commencing the approach, you may insert a speed constraint at the FAF (Final Approach Fix).
When all computations are completed.

– REVIEW the flight plan, using the approach chart.

Note : When the crew changes the approach or the destination runway, and if the previously selected approach procedure is compatible with the new one, the system automatically inserts it in the temporary F-PLN.
For further details, refer to FCOM 4.04.18 "CHANGING THE ARRIVAL".





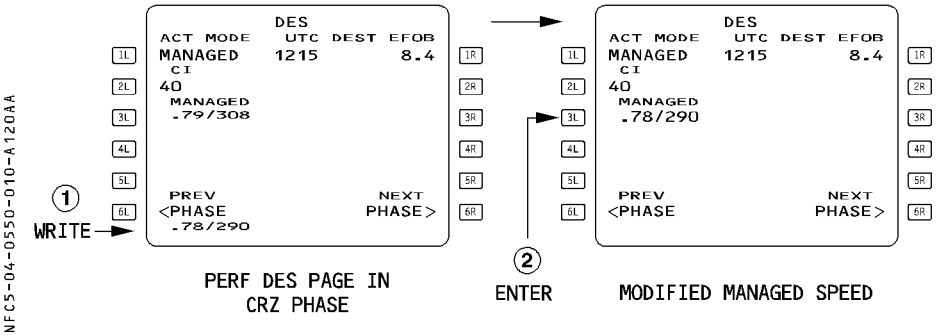
NFC5-04-0550-009-A130AA

ENTERING THE WINDS FOR DESCENT

Refer to 4.04.28.

PRESELECTING A MANAGED SPEED/MACH

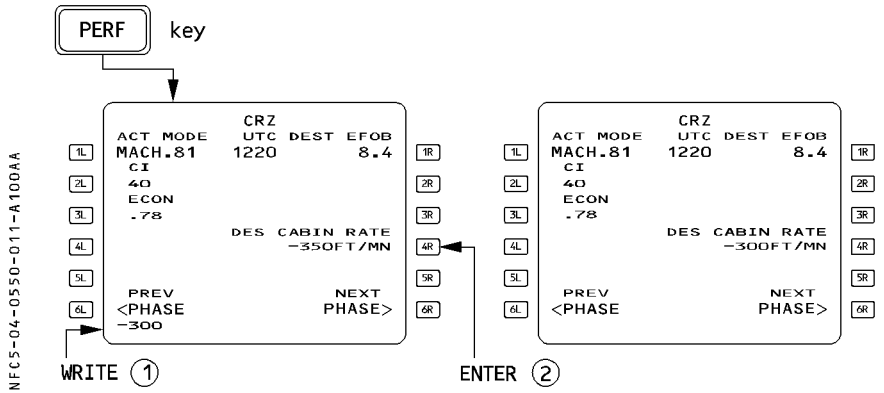
As long as the descent phase is not active, the PERF DES page may either be used to select a speed, or a Mach number, or both, to replace the optimum descent speed.
The Flight Guidance Computer then uses the entered speed, instead of the optimum speed for computing the descent profile.
When the system switches to the descent phase, it sets the MANAGED target speed to the entered speed. From there, the speed may only be modified by using the FCU selector knob.
Once in descent phase, the pilot cannot modify the MANAGED speed again.



Procedure

- **PRESS the PERF key on the MCDU.**
- **SELECT the "NEXT PHASE" prompt.**
- **WRITE the descent speed into the scratchpad and ENTER it.**
  The 3L field displays the imposed managed speed value.

MODIFICATION OF THE CABIN RATE



Procedure :

R
- **PRESS the MCDU's PERF key.**
- **WRITE the new cabin rate in the scratchpad.**
- **ENTER it in the [4R] field.**

ENTERING THE APPROACH DATA

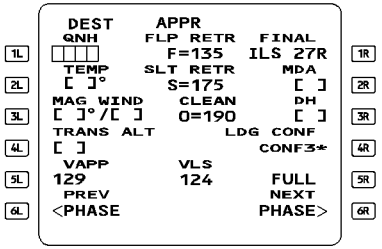
— **From PERF DES page, SELECT "NEXT PHASE" [6R] key to display the APPR page.**

— **ENTER QNH, TEMP, WIND at destination (magnetic north reference). MDA/MDH or DH**

R (The PFD displays the MDA/MDH or DH only after the descent phase has been activated.)

— **CHECK and, if necessary, MODIFY**
- LDG CONF (landing configuration)
- Vapp (the FM-computed value may be modified)
- TRANS ALT (transition altitude)

NFC5-04-0550-012-A001AA

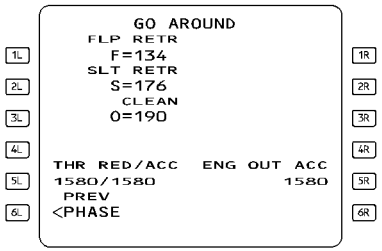


The scratchpad displays "ENTER DEST DATA" if the approach page is not completed when the aircraft is 180 NM from destination.

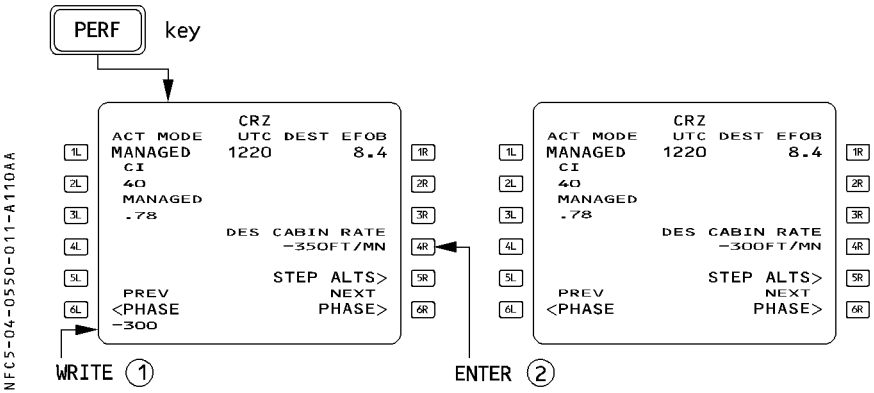
— **SELECT "NEXT PHASE" in order to display the GO AROUND page.**

— **CHECK and, if necessary, MODIFY the THR RED ALT and the ACC ALT.**

NFC5-04-0550-012-B001AA



MODIFICATION OF THE CABIN RATE



Procedure

- **PRESS the PERF key on MCDU**
- **WRITE the new cabin rate into the scratchpad**
- **ENTER it in the [4R] field.**

ENTERING THE APPROACH DATA

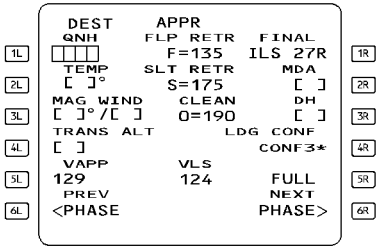
— **From PERF DES page, SELECT "NEXT PHASE" [6R] key to display the APPR page.**

— **ENTER QNH, TEMP, WIND at destination (magnetic north reference), DH or MDA (MDH depending on the OPC option).**

R (The PFD displays the MDA/MDH or DH only when the distance to destination is less than 250 NM).

— **CHECK and, if necessary, MODIFY**
- LDG CONF (landing configuration)
- Vapp (the FM-computed value may be modified)
- TRANS ALT (transition altitude)

NFC5-04-0550-012-A110AA

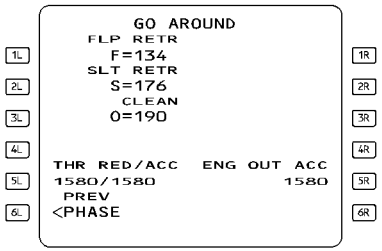


The scratchpad displays "ENTER DEST DATA" if the approach page is not completed when the aircraft is 180 NM from destination.

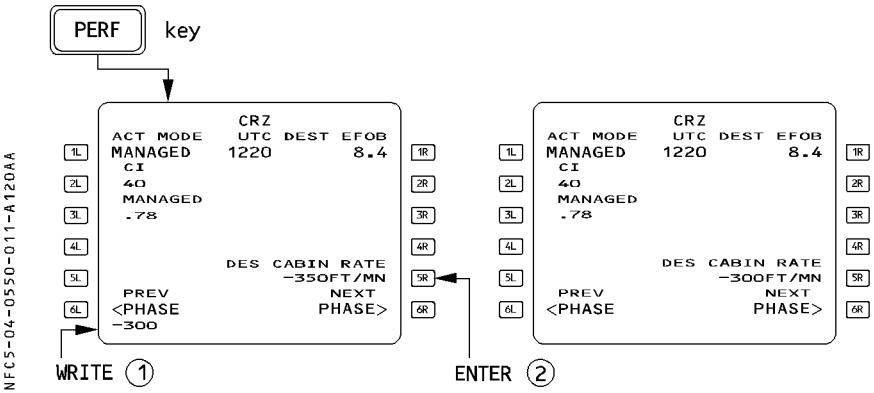
— **SELECT "NEXT PHASE" in order to display the GO AROUND page.**

— **CHECK and, if necessary, MODIFY the THR RED ALT and the ACC ALT.**

NFC5-04-0550-012-B110AA



MODIFICATION OF THE CABIN RATE



Procedure

- PRESS the PERF key on MCDU
- WRITE the new cabin rate into the scratchpad
- ENTER it in the [5R] field.

ENTERING THE APPROACH DATA

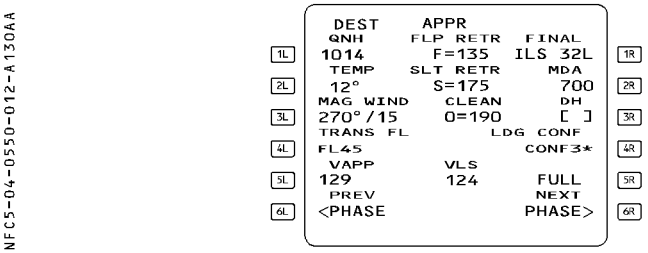
- **From PERF DES page, SELECT "NEXT PHASE" [6R] key to display the APPR page.**

- **ENTER QNH, TEMP, WIND at destination (magnetic north reference), DH or MDA (MDH depending on the OPC option).**
  (The PFD displays the entered MDA/MDH or DH value, only when the distance to destination is less than 250 NM).

- **CHECK and, if necessary, MODIFY the LDG CONF (landing configuration)**

- **CHECK, and if necessary MODIFY the VAPP**
  The FMS-computed value may be modified

- **CHECK the TRANS FL value**
  (see note 1 below)



NFC5-04-0550-012-A130AA

Note : 1. The default TRANS FL value is computed by the FMS based on :
- *The Transition Altitude of the destination airport (extracted from the Nav Database)*
- *The QNH value entered on PERF APPR page. Due to the internal FMS computation of altitude constraints, it is rounded to the upper multiple of 5.*
  The crew should not modify this default TRANS FL value, if it slightly differs from the Transition Level specified on the approach chart or reported by ATC.

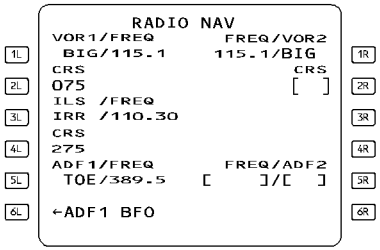
2. The scratchpad displays "ENTER DEST DATA" if the PERF APPR page has not been completed when the aircraft is less than 180 NM from destination.

SELECTING THE RADIO NAVAIDS

– **CHECK or SELECT the NAVAIDS appropriate for the approach.**
For an ILS procedure, the ILS will be autotuned.
NDBs must be manually entered.

Note : When the destination has a VOR/DME, ENTER it manually in the VOR field. ENTER its identifier in the BRG/DIST field of the PROG page. This allows you to perform a permanent NAV accuracy check.

NFC5-04-0550-013-A001AA



COST INDEX FOR LONG-RANGE CRUISE

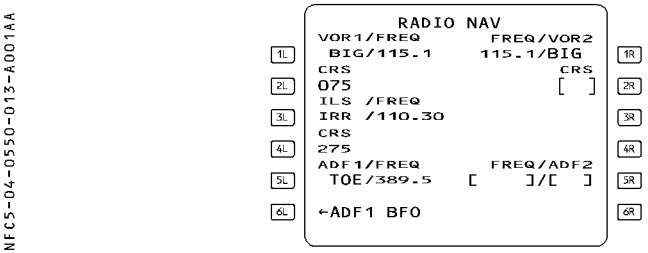
R The flight crew can use the table below to find an approximate Cost Index value that is
R calculated for cruise at long-range cruise speed. This value is valid for CRZ FL = OPT ALT
R ± 10 000 feet.
R

AIRCRAFT	ENGINE	CILRC	
		kg/min	100 lbs/hr
A318/A319/A320/A321	CFM 56-5-A4/A5	20	30
	CFM 56-5-A1/A3	45	60
	CFM 56-5-B1/B2/B3	65	85
	CFM 56-5-B4/P	5	10
	CFM 56-5-B5/B6/B7	5	10
	V2522/V2524/V2527M	30	40
	V2527/V2527E	40	55
	V2500	45	60
	V2530/V2533	50	70

SELECTING THE RADIO NAVAIDS

– **CHECK or SELECT the NAVAIDS appropriate for the approach.**
For an ILS procedure, the ILS will be autotuned.
NDBs must be manually entered.

Note : When the destination has a VOR/DME, ENTER it manually in the VOR field. ENTER its identifier in the BRG/DIST field of the PROG page. This allows you to perform a permanent NAV accuracy check.



NFC5-04-0550-013-A001AA

COST INDEX FOR LONG RANGE CRUISE

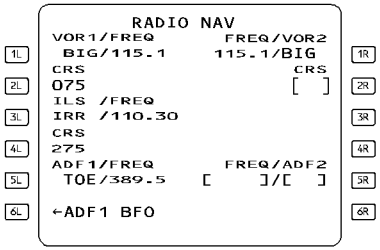
The flight crew can use the table below to find an approximate Cost Index value that is calculated for cruise at long-range cruise speed. This value is valid for CRZ FL = OPT ALT ± 10 000 feet.

AIRCRAFT	ENGINE	CILRC	
		kg/min	100 lbs/hr
A318/A319/A320/A321	CFM 56-5-A1/A3	45	60
	CFM 56-5-A4/A5	40	55
	CFM 56-5-B1/B2/B3	65	85
	CFM 56-5-B4	55	75
	CFM 56-5-B5/B6/B7	25	35
	V2500	45	60
	V2522/V2524/V2527M	50	70
	V2530/V2533	50	70
	V2527/V2527E	40	55

– **SELECT "NEXT PHASE" in order to display the GO AROUND page.**

– **CHECK and, if necessary, MODIFY the THR RED ALT and the ACC ALT.**

NFCS-04-0550-013-A130AA

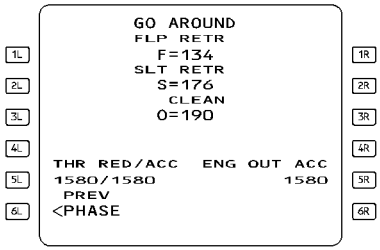


SELECTING THE RADIO NAVAIDS

– **CHECK or SELECT the NAVAIDS appropriate for the approach.**
For an ILS procedure, the ILS will be autotuned.
NDBs must be manually entered.

Note : When the destination has a VOR/DME, ENTER it manually in the VOR field. ENTER its identifier in the BRG/DIST field of the PROG page. This allows you to perform a permanent NAV accuracy check.

NFCS-04-0550-013-B130AA



COST INDEX FOR LONG RANGE CRUISE

The flight crew can use the table below to find an approximate Cost Index value that is calculated for cruise at long-range cruise speed. This value is valid for CRZ FL = OPT ALT ± 10 000 feet.

AIRCRAFT	ENGINE	CILRC	
		kg/min	100 lbs/hr
A318/A319/A320/A321	CFM 56-5-A1/A3	45	60
	CFM 56-5-A4/A5	40	55
	CFM 56-5-B1/B2/B3	65	85
	CFM 56-5-B4	55	75
	CFM 56-5-B5/B6/B7	25	35
	V2500	45	60
	V2522/V2524/V2527M	50	70
	V2530/V2533	50	70
	V2527/V2527E	40	55

R **DESCENT INITIATION**

The top of descent, displayed on the F-PLN page (T/D) and on the ND (¬↘), is a position that the system calculates, assuming that the aircraft will begin its descent in DES mode with managed speed, and that the system will guide the aircraft along the descent profile computed with all the vertical F-PLN data (ALT CSTR, ECON or AUTO MACH/SPD, SPD CSTR, SPD LIMIT) to reach VAPP at 1000 FT AGL.

R *Note : The ND does not display the top of descent ¬↘ when HDG (or TRACK) mode is engaged.*

Procedures

When the aircraft reaches the top of descent (F/D) :

- **SELECT the altitude target.**
- **PUSH the ALT selector knob. DES mode engages.**
- **CHECK the FMA annunciators.**

R **DESCENT MONITORING**

DES MODE ENGAGED

When DES mode is engaged, NAV mode is engaged, and the system takes into account all altitude and speed constraints.
The key parameter for monitoring the descent is the vertical deviation (VDEV) displayed on the PFD and on the PROG page, which indicates whether the aircraft is on, above, or below the descent profile.

Procedure

– **SET the ATC cleared altitude on the FCU (considering also what is the safe altitude).**
If the lowest safe altitude is higher than the ATC-cleared altitude, check with ATC that this constraint applies.
If it is confirmed, SET the FCU altitude to the safe altitude until it is safe to go to the ATC-cleared altitude.

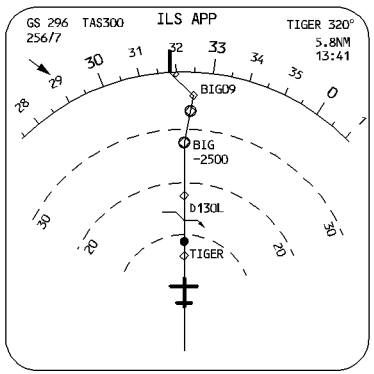
– **MONITOR the vertical deviation (VDEV) on the PFD and the PROG page.**

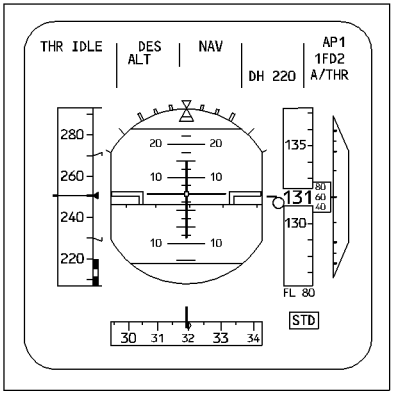
– **MONITOR the speed change that occurs when the aircraft reaches a speed change symbol (magenta ball) under managed speed.**

– **MONITOR the FMA (ALT*, ALT CST*, ALT, ALT CST) when the aircraft reaches level symbols.**

- **If the aircraft is on the descent profile**
The aircraft is considered to be on the vertical profile when it is within 50 feet of it. VDEV is close to zero, and the system predicts that it will match constraints until the aircraft levels off at the next FCU altitude.

– **MONITOR the predicted descent point after the next level-off.**
The A/THR adjusts the thrust for the particular segment. The first FMA column may display “THR IDLE” or “SPEED”.





NFC5-04-0560-002-A100AA

R **DESCENT INITIATION**

The top of descent, displayed on the F-PLN page (T/D) and on the ND (¬↘), is a position that the system calculates, assuming that the aircraft will begin its descent in DES mode with managed speed, and that the system will guide the aircraft along the descent profile computed with all the vertical F-PLN data (ALT CSTR, ECON or AUTO MACH/SPD, SPD CSTR, SPD LIMIT) to reach VAPP at 1000 FT AGL.

R *Note : The ND does not display the top of descent ¬↘ when HDG (or TRACK) mode is engaged.*

Procedures

When the aircraft reaches the top of descent (F/D) :

- **SELECT the altitude target.**
- **PUSH the ALT selector knob. DES mode engages.**
- **CHECK the FMA annunciators.**

R **DESCENT MONITORING**

DES MODE ENGAGED

When DES mode is engaged, NAV mode is engaged, and the system takes into account all altitude and speed constraints.
The key parameter for monitoring the descent is the vertical deviation (VDEV) displayed on the PFD and on the PROG page, which indicates whether the aircraft is on, above, or below the descent profile.

Procedure

– **SET the ATC-cleared altitude on the FCU (considering which altitude is safe).**
If the lowest safe altitude is higher than the ATC-cleared altitude, check with ATC to verify if this constraint applies.
If it is confirmed, SET the FCU altitude to the safe altitude, until it is safe to go to the ATC-cleared altitude.

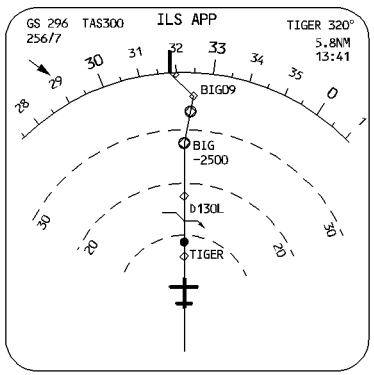
– **MONITOR vertical deviation (VDEV) on both the PFD and the PROG page.**

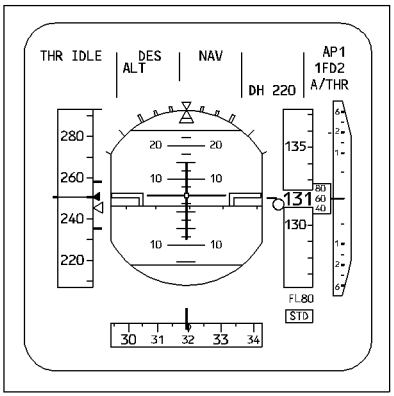
– **MONITOR the speed change that occurs, when the aircraft reaches a speed change symbol (magenta ball) under managed speed.**

– **MONITOR the FMA (ALT*, ALT CST*, ALT, ALT CST), when the aircraft reaches level symbols.**

- **If the aircraft is on the descent profile :**
The aircraft is considered to be on the vertical profile, when it is within 50 feet of it. VDEV is close to zero, and the system predicts that it will match constraints until the aircraft levels off at the next FCU altitude.

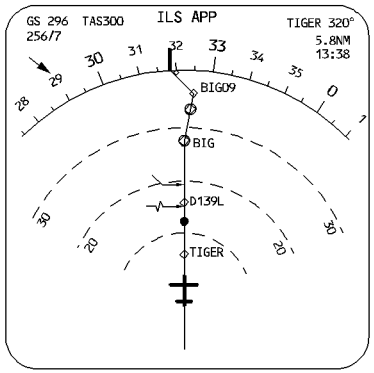
– **MONITOR the predicted descent point after the next level-off.**
A/THR adjusts thrust for the particular segment. The first FMA column may display “THR IDLE” or “SPEED”.

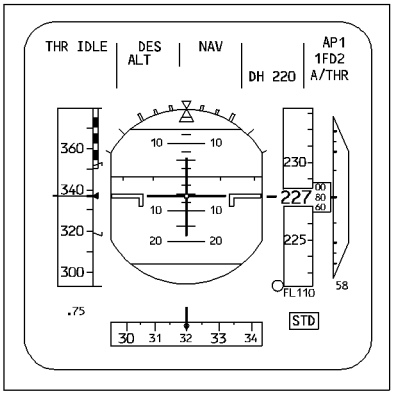


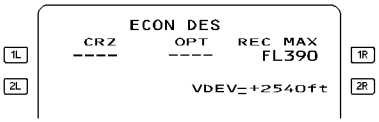


NFC5-04-0560-002-A200AA

- **If the aircraft is above the descent profile**
  VDEV is down on the PFD and positive on the PROG page.
  The A/THR sets IDLE thrust and the AP increases speed by calling for down elevator.
  If the aircraft reaches the upper limit of the managed speed range, the aircraft diverges and maintains the upper limit speed.







NFCS-04-0560-003-A100AA

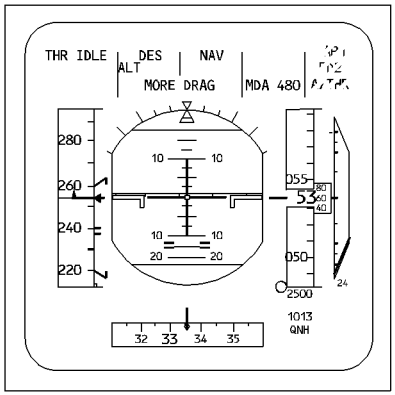
Procedure

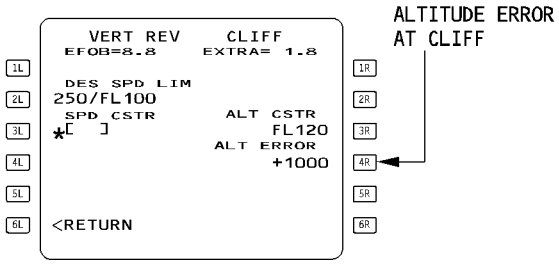
– **SELECT a descent speed higher than the upper limit when possible.**

– **MONITOR the intercept symbol ∿→ .**
When this symbol reaches the next ALT CSTR waypoint "MORE DRAG" appears on the PFD indicating that speedbrakes must be extended in order to match the next altitude constraint. This is an advisory message.

Note : When DES mode is engaged, the speed brake extension will not necessarily increase the descent rate. It does so only if the aircraft is above the profile. If the aircraft is on or below the profile : the system will add thrust to keep the aircraft on profile and within the speed target range.

If an altitude constraint is predicted to be missed by more than 250 feet the vertical revision page shows ALT ERROR at the waypoint.



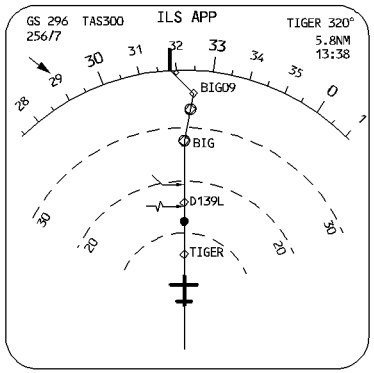


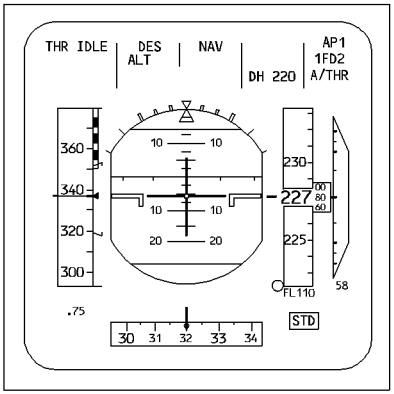
NFCS-04-0560-004-A100AA

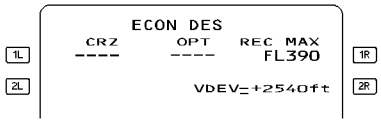
If a speed constraint is predicted to be missed by more than 10 knots :

- **SELECT an appropriate speed.**
- **RESUME managed speed when the aircraft is back on the descent path.**

- **If the aircraft is above the descent profile**
  VDEV is down on the PFD and positive on the PROG page.
  The A/THR sets IDLE thrust and the AP increases speed by calling for down elevator.
  If the aircraft reaches the upper limit of the managed speed range, the aircraft diverges and maintains the upper limit speed.







NFCS-04-0560-003-A100AA

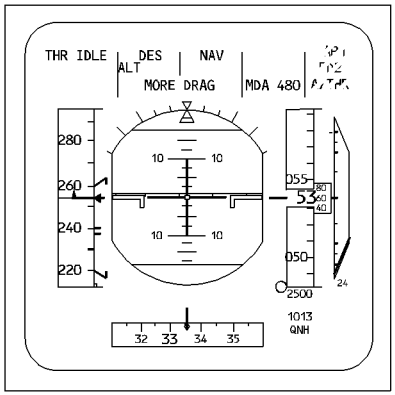
Procedure

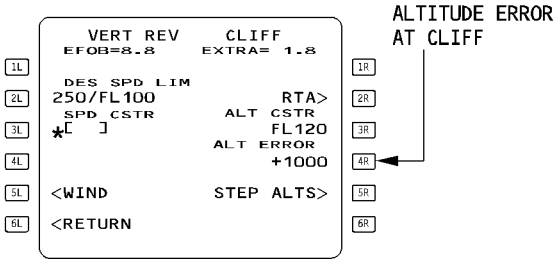
– **SELECT a descent speed higher than the upper limit when possible.**

– **MONITOR the intercept symbol ∿→ .**
When this symbol reaches the next ALT CSTR waypoint "MORE DRAG" appears on the PFD indicating that speedbrakes must be extended in order to match the next altitude constraint. This is an advisory message.

Note : When DES mode is engaged, the speed brake extension will not necessarily increase the descent rate. It does so only if the aircraft is above the profile. If the aircraft is on or below the profile : the system will add thrust to keep the aircraft on profile and within the speed target range.

If an altitude constraint is predicted to be missed by more than 250 feet the vertical revision page shows ALT ERROR at the waypoint.



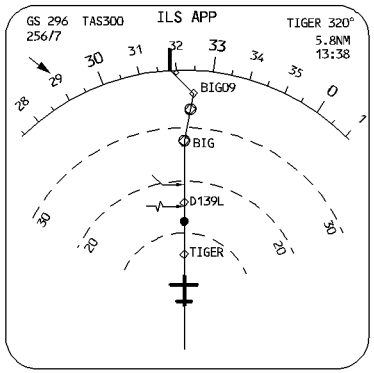


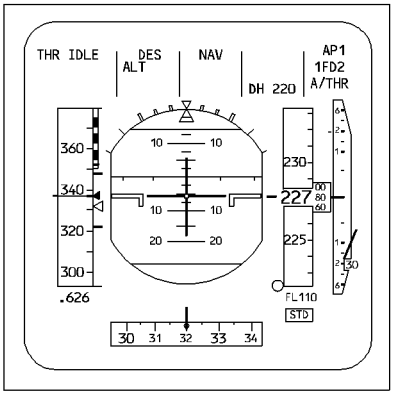
NFCS-04-0560-004-A110AA

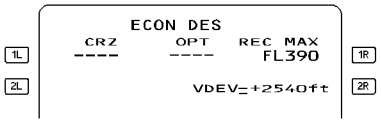
If a speed constraint is predicted to be missed by more than 10 knots :

- **SELECT an appropriate speed.**
- **RESUME managed speed when the aircraft is back on the descent path.**

- **If the aircraft is above the descent profile :**
  VDEV is down on the PFD and positive on the PROG page.
  A/THR sets IDLE thrust and the AP increases speed by calling for down elevator. If the aircraft reaches the upper limit of the managed speed range, the aircraft diverges and maintains the upper limit speed.







NFCS-04-0560-003-A200AA

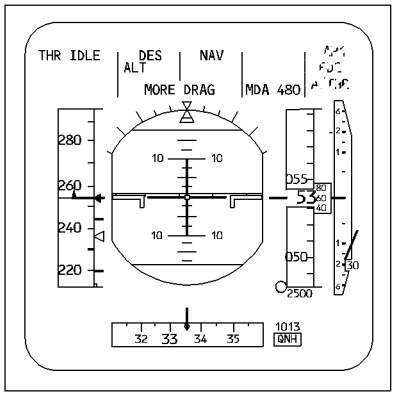
Procedure :

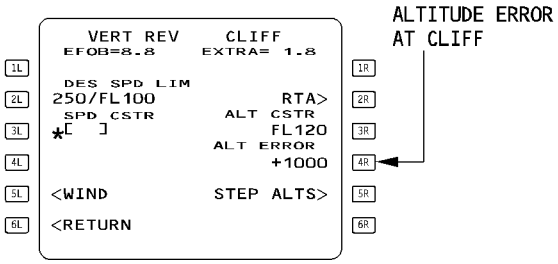
– **SELECT a descent speed higher than the upper limit, when possible.**

– **MONITOR the intercept symbol ∿→ .**
When this symbol reaches the next ALT CSTR waypoint, "MORE DRAG" appears on the PFD, indicating that speedbrakes must be extended in order to match the next altitude constraint. This is an advisory message.

Note : When DES mode is engaged, speedbrake extension will not necessarily increase the descent rate. It only does so, if the aircraft is above the profile. If the aircraft is on, or below, the profile : The system will add thrust to maintain the aircraft on profile and within the speed target range.

If an altitude constraint is predicted to be missed by more than 250 feet the vertical revision page shows ALT ERROR at the waypoint.



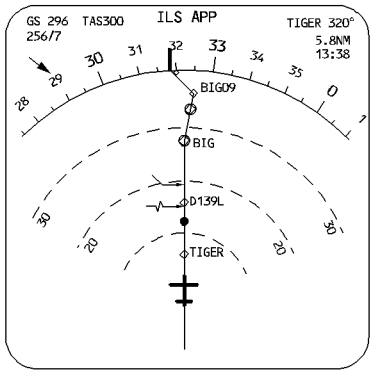


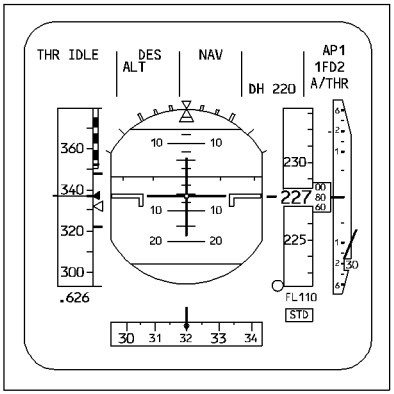
NFCS-04-0560-004-A300AA

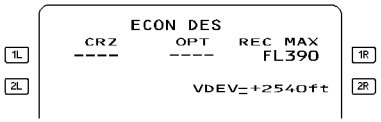
If a speed constraint is predicted to be missed by more than 10 knots :

- **SELECT an appropriate speed.**
- **RESUME managed speed when the aircraft is back on the descent path.**

- **If the aircraft is above the descent profile :**
  VDEV is down on the PFD and positive on the PROG page.
  A/THR sets IDLE thrust and the AP increases speed by calling for down elevator. If the aircraft reaches the upper limit of the managed speed range, the aircraft diverges and maintains the upper limit speed.







NFCS-04-0560-003-A200AA

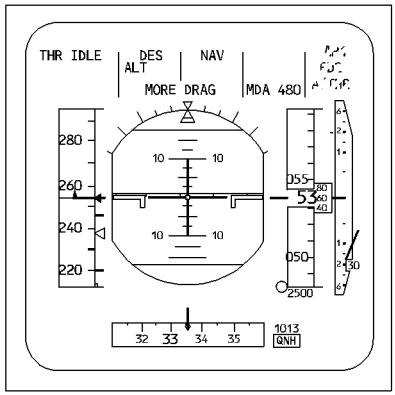
Procedure :

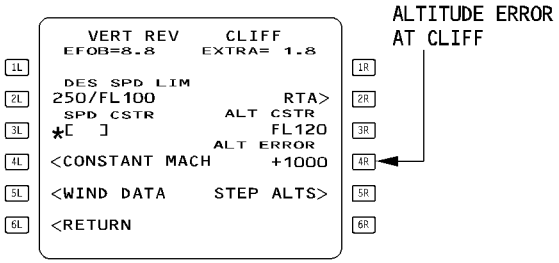
– **SELECT a descent speed higher than the upper limit, when possible.**

– **MONITOR the intercept symbol ∿→ .**
When this symbol reaches the next ALT CSTR waypoint, "MORE DRAG" appears on the PFD, indicating that speedbrakes must be extended in order to match the next altitude constraint. This is an advisory message.

Note : When DES mode is engaged, speedbrake extension will not necessarily increase the descent rate. It only does so, if the aircraft is above the profile. If the aircraft is on, or below, the profile : The system will add thrust to maintain the aircraft on profile and within the speed target range.

If an altitude constraint is predicted to be missed by more than 250 feet, the vertical revision page shows ALT ERROR at the waypoint.





NFCS-04-0560-004-A403AA

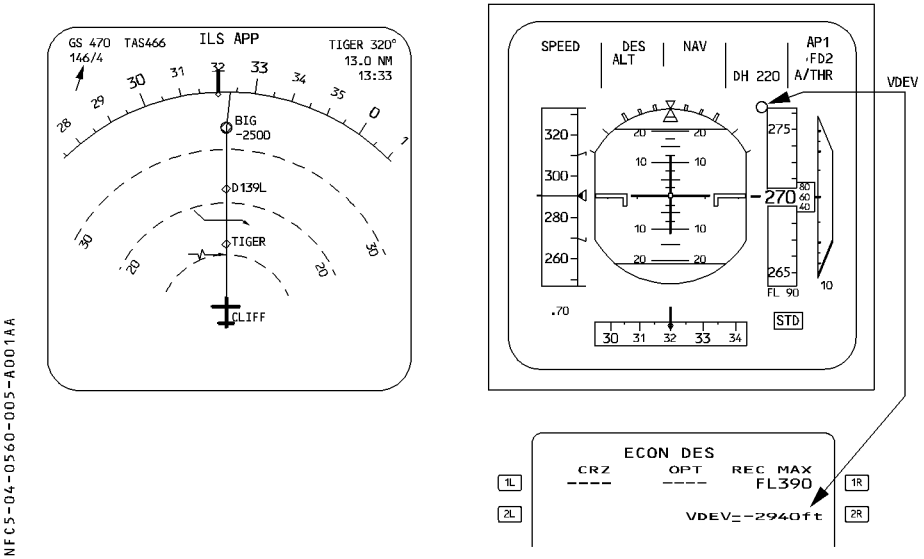
If a speed constraint is predicted to be missed by more than 10 knots :

- **SELECT an appropriate speed.**
- **RESUME managed speed when the aircraft is back on the descent profile.**

- **If the aircraft is below the descent profile**
  VDEV is up on the PFD and negative on the PROG page. The system maintains the target speed (managed or selected speed).

  – MONITOR the intercept symbol ([∿→]) on the ND and any leveling off at the next ALT CSTR.

R The A/THR is in speed mode with a –1000 ft/min rate of descent (if the aircraft is flying
R an idle segment) or half the theoretical FPA of the descent profile (if the aircraft is flying
R a geometric segment), until the profile is regained.



NFCS-04-0560-005-A001AA

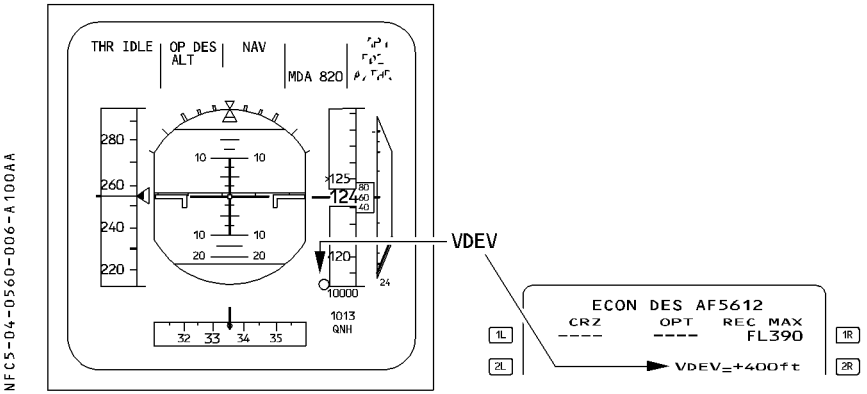
<u>If the rate of descent has to be increased (ATC requirement) :</u>

– SELECT OP DES mode

– Increase the target speed or extend the speedbrakes.

OP DES, V/S or FPA MODE ENGAGED

- In either case, the aircraft is no longer guided on the descent profile and altitude constraints are disregarded. If NAV mode is engaged the ND displays a white circle on waypoint with an altitude constraint. If NAV mode is disengaged, the circle is removed.
- The PFD still shows VDEV for reference purposes.
- The target altitude is always the FCU selected altitude (shown in blue).
  On the ND, level-off symbol is blue (no constraint). If NAV mode is engaged and the speed target managed, speed constraints are considered.



When HDG or TRK mode is engaged, vertical position may also be assessed on the ND using the energy circle. It is displayed as a green arc oriented on the current track and centered on the aircraft current position.

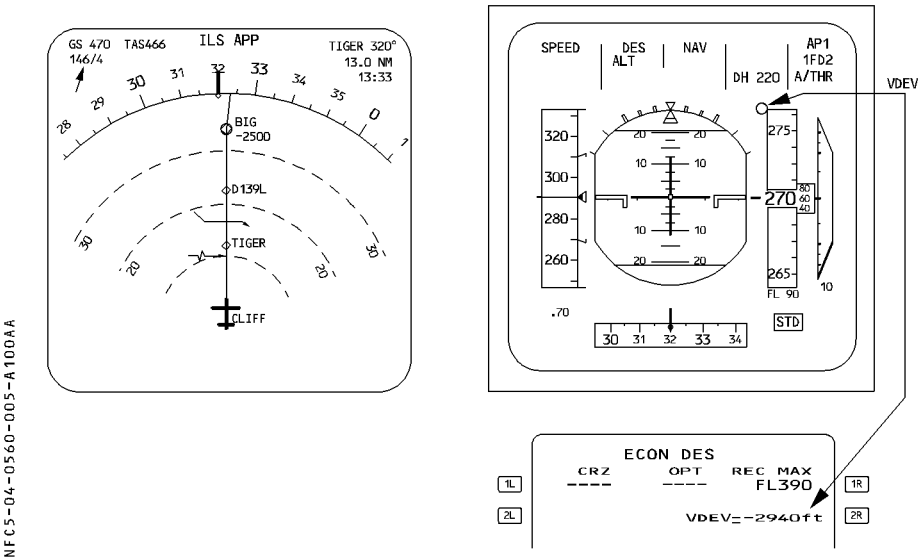
Note : Altitude and speed predictions displayed on the F-PLN page assume an immediate return to DES mode.

- **If the aircraft is below the descent profile**
  VDEV is up on the PFD and negative on the PROG page. The system maintains the target speed (managed or selected speed).

  – MONITOR the intercept symbol ([∿→]) on the ND and any leveling off at the next ALT CSTR.

R - **If the aircraft is flying above the max descent speed limit altitude, or 5 000**
R **ft above the destination elevation :**
R The FMGS maintains the V/S at – 1 000 ft/min and the target speed, until the aircraft
R reaches the altitude constraint or intercepts the descent profile.

R - **If the aircraft is flying below the max descent speed limit altitude, or 5 000**
R **ft above the destination elevation :**
R The FMGS maintains the V/S at – 500 ft/min and the target speed, until the aircraft
R intercepts either the altitude constraint or the descent profile.



NFCS-04-0560-005-A100AA

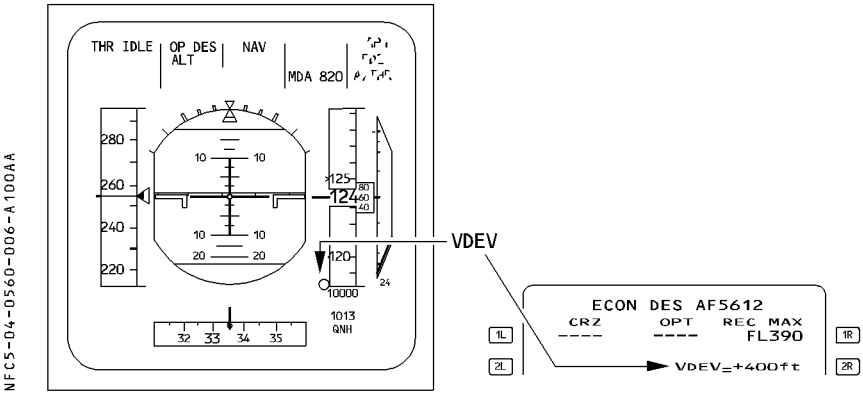
If the rate of descent has to be increased (ATC requirement) :

– SELECT OP DES mode

– INCREASE the target speed or extend the speedbrakes.

OP DES, V/S or FPA MODE ENGAGED

- In either case, the aircraft is no longer guided on the descent profile and altitude constraints are disregarded. If NAV mode is engaged the ND displays a white circle on waypoint with an altitude constraint. If NAV mode is disengaged, the circle is removed.
- The PFD still shows VDEV for reference purposes.
- The target altitude is always the FCU selected altitude (shown in blue).
  On the ND, level-off symbol is blue (no constraint). If NAV mode is engaged and the speed target managed, speed constraints are considered.



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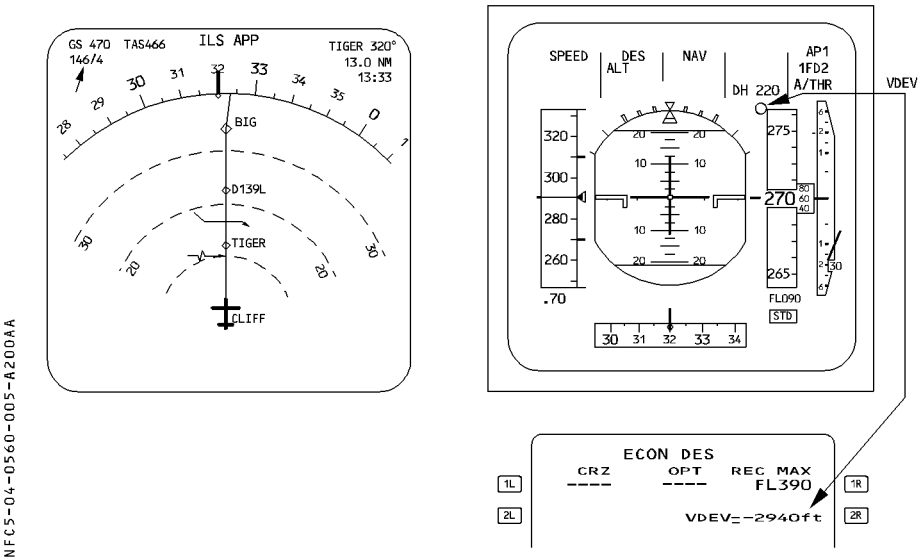
Note : Altitude and speed predictions displayed on the F-PLN page assume an immediate return to DES mode.

- **If the aircraft is below the descent profile**
  VDEV is up on the PFD and negative on the PROG page. The system maintains the target speed (managed or selected speed).

  – MONITOR the intercept symbol ([∿→]) on the ND and any leveling off at the next ALT CSTR.

R - **If the aircraft is flying above the max descent speed limit altitude, or 5 000 ft above the destination elevation :**
R The FMGS maintains the V/S at – 1 000 ft/min and the target speed, until the aircraft reaches the altitude constraint or intercepts the descent profile.

R - **If the aircraft is flying below the max descent speed limit altitude, or 5 000 ft above the destination elevation :**
R The FMGS maintains the V/S at – 500 ft/min and the target speed, until the aircraft intercepts either the altitude constraint or the descent profile.



NFCS-04-0560-005-A200AA

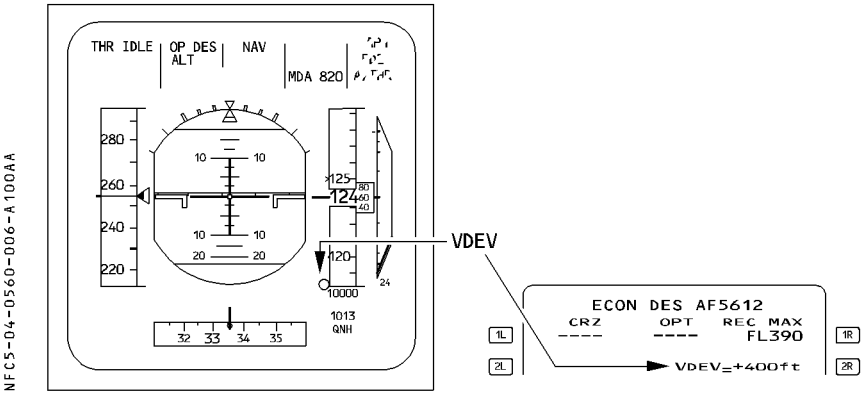
<u>If the rate of descent has to be increased (ATC requirement) :</u>

– SELECT OP DES mode

– INCREASE the target speed or extend the speedbrakes.

OP DES, V/S or FPA MODE ENGAGED

- In either case, the aircraft is no longer guided on the descent profile and altitude constraints are disregarded. If NAV mode is engaged the ND displays a white circle on waypoint with an altitude constraint. If NAV mode is disengaged, the circle is removed.
- The PFD still shows VDEV for reference purposes.
- The target altitude is always the FCU selected altitude (shown in blue).
  On the ND, level-off symbol is blue (no constraint). If NAV mode is engaged and the speed target managed, speed constraints are considered.



When HDG or TRK mode is engaged, vertical position may also be assessed on the ND using the energy circle. It is displayed as a green arc oriented on the current track and centered on the aircraft current position.

Note : Altitude and speed predictions displayed on the F-PLN page assume an immediate return to DES mode.

Procedure

– SET the FCU altitude as cleared by ATC, while considering the applicable safe altitude.
If the next safe altitude is higher than the ATC-cleared altitude, check with the ATC to verify that this constraint applies.
If confirmed, set the FCU altitude to the safe altitude, until it is safe to fly at the cleared altitude.

– MONITOR the speed target, when the aircraft reaches the speed change symbol.

– MONITOR the FMA ALT*, ALT, upon reaching the level symbol.

R **– When in HDG/TRK mode, MONITOR the energy circle (if installed) on the ND.**
The MCDU F-PLN page presents SPD/ALT constraint-matching predictions, which assume that DES mode is immediately re-engaged.

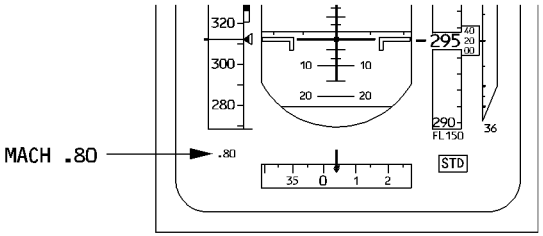
– CHECK the predictions before re-engaging DES mode (in order to resume the descent profile).

Note : VDEV is available on the PFD even in HDG mode ; it is a valuable tool for monitoring the descent, as long as crosstrack error (XTK) is less than five nautical miles.
The aircraft automatically decelerates for approach, only if it flies over the DECEL pseudo waypoint with NAV mode engaged (or LOC, LOC).*

EXPEDITE DESCENT ◁

When ATC requires a rapid descent :

– DEPRESS THE EXPED pushbutton
Flight guidance (FG) pitches the aircraft to acquire and maintain 0.80/340. FG orders a pitch rate that produces no more than 0.15 g. The pilot can use this mode to initiate an emergency descent. To resume normal descent, PUSH the ALT selection knob or engage any other vertical mode.



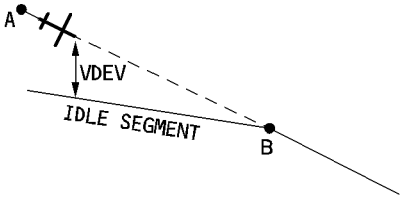
NFCS-04-0560-007-A001AA

MONITORING THE NAVIGATION IN THE TERMINAL CONTROL AREA

If the MCDU "SYSTEM RNP IS XX.X" message is displayed, the pilot will verify the manually-entered RNP value in the REQUIRED field of the PROG page and clear or modify it, if it is not in accordance with the RNP value specified in the area (Nav or approach chart).

R **TOO STEEP PATH**

"TOO STEEP PATH AHEAD" appears on the MCDU scratchpad, when the system predicts this situation, and TOO STEEP PATH is displayed on the F-PLN page.
When the aircraft is crossing the first waypoint of a TOO STEEP PATH, the system computes a flyable descent profile (with an idle segment). The VDEV makes a jump because it is related to a new profile.



NFC5-04-0560-008-A001AA

```
   VERT REV AT  FIR96
 EFOB=6.4     EXTRA=3.0
 TOO STEEP PATH BEYOND
 DES SPD LIM
250/FL100
  SPD CSTR          ALT CSTR
*[   ]                +FL260




<RETURN
```

```
                                AI101→
  UB191     UTC     SPD/ALT
 ABB        1238  .78/FL330
                        13NM
 (T/D)      1239  .79/FL330
  BIG1A     TRK320° 21
 FIR96      1242310/*FL260

-----TOO STEEP PATH-----
  BIG1A
 CLIFF      1246293/*FL120
  DEST  UTC  DIST EFOB
 EGLL27R 1301  149   6.1
 TOO STEEP PATH AHEAD ↑↓
```

F-PLN A PAGE WITH A TOO STEEP PATH

Procedure

When passing the first waypoint of the TOO STEEP PATH :

- **MONITOR VDEV and predictions at the next CSTR waypoint.**
- **If required, EXTEND the speedbrakes before seeing the "MORE DRAG" (or "AIRBRAKES") message.**
- **CONSIDER using a holding pattern, if necessary.**

Procedure

— **SET the FCU altitude as cleared by ATC, while considering the applicable safe altitude.**
If the next safe altitude is higher than the ATC-cleared altitude, check with the ATC to verify that this constraint applies.
If confirmed, set the FCU altitude to the safe altitude, until it is safe to fly at the cleared altitude.

— **MONITOR the speed target, when the aircraft reaches the speed change symbol.**

— **MONITOR the FMA ALT*, ALT, upon reaching the level symbol.**

R — **When in HDG/TRK mode, MONITOR the energy circle (if installed) on the ND.**
The MCDU F-PLN page presents SPD/ALT constraint-matching predictions, which assume that DES mode is immediately re-engaged.

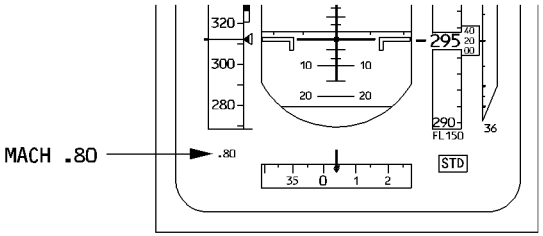
— **CHECK the predictions before re-engaging DES mode (in order to resume the descent profile).**

Note : VDEV is available on the PFD even in HDG mode ; it is a valuable tool for monitoring the descent, as long as crosstrack error (XTK) is less than five nautical miles.
The aircraft automatically decelerates for approach, only if it flies over the DECEL pseudo waypoint with NAV mode engaged (or LOC, LOC).*

EXPEDITE DESCENT ◁

When ATC requires a rapid descent :

— **DEPRESS THE EXPED pushbutton**
Flight guidance (FG) pitches the aircraft to acquire and maintain 0.80/340. FG orders a pitch rate that produces no more than 0.15 g. The pilot can use this mode to initiate an emergency descent. To resume normal descent, PUSH the ALT selection knob or engage any other vertical mode.



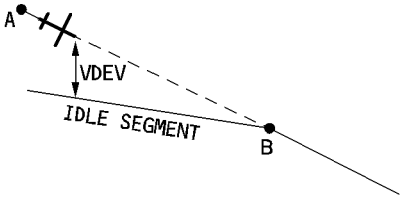
NFCS-04-0560-007-A001AA

MONITORING THE NAVIGATION IN THE TERMINAL CONTROL AREA

If the MCDU "AREA RNP IS XX.X" message or "PROCEDURE RNP IS XX.X" message is displayed, the pilot will verify the manually-entered RNP value in the REQUIRED field of the PROG page and clear or modify it, if it is not in accordance with the RNP value specified in the area (Nav or approach chart).

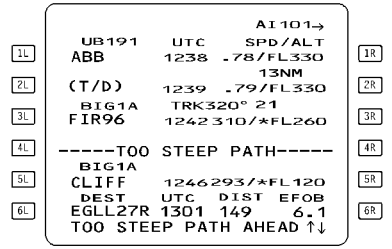
R **TOO STEEP PATH**

"TOO STEEP PATH AHEAD" appears on the MCDU scratchpad, when the system predicts this situation, and TOO STEEP PATH is displayed on the F-PLN page.
When the aircraft is crossing the first waypoint of a TOO STEEP PATH, the system computes a flyable descent profile (with an idle segment). The VDEV makes a jump because it is related to a new profile.



NFC5-04-0560-008-A110AA





F-PLN A PAGE WITH A TOO STEEP PATH

Procedure

When passing the first waypoint of the TOO STEEP PATH :

- **MONITOR VDEV and predictions at the next CSTR waypoint.**
- **If required, EXTEND the speedbrakes before seeing the "MORE DRAG" message.**
- **CONSIDER using a holding pattern, if necessary.**

Procedure

– SET the FCU altitude as cleared by ATC, while considering the applicable safe altitude.
If the next safe altitude is higher than the ATC-cleared altitude, check with the ATC to verify that this constraint applies.
If confirmed, set the FCU altitude to the safe altitude, until it is safe to fly at the cleared altitude.

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– MONITOR the FMA ALT*, ALT, upon reaching the level symbol.

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The MCDU F-PLN page presents SPD/ALT constraint-matching predictions, which assume that DES mode is immediately re-engaged.

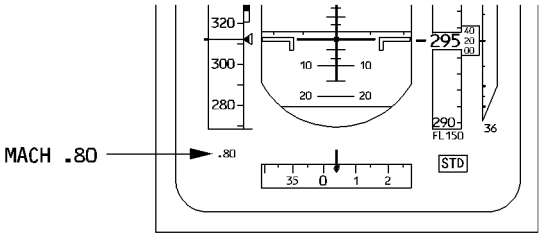
– CHECK the predictions before re-engaging DES mode (in order to resume the descent profile).

Note : VDEV is available on the PFD even in HDG mode ; it is a valuable tool for monitoring the descent, as long as crosstrack error (XTK) is less than five nautical miles.
The aircraft automatically decelerates for approach, only if it flies over the DECEL pseudo waypoint with NAV mode engaged (or LOC, LOC).*

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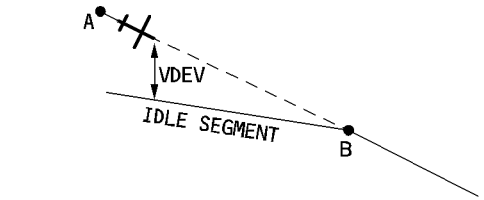
NFCS-04-0560-007-A001AA

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TOO STEEP PATH

"TOO STEEP PATH AHEAD" appears on the MCDU scratchpad, when the system predicts this situation, and TOO STEEP PATH is displayed on the F-PLN page.
When the aircraft is crossing the first waypoint of a TOO STEEP PATH, the system computes a flyable descent profile (with an idle segment). The VDEV makes a jump because it is related to a new profile.



NFC5-04-0560-008-A115AA

```
      VERT REV AT  FIR96
 EFOB=6.4     EXTRA=3.0
 TOO STEEP PATH BEYOND
 DES SPD LIM     UTC
250/FL100            RTA>
 SPD CSTR       ALT CSTR
*[  ]               +FL260

<CONSTANT MACH
 ACCESS
<WIND DATA     STEP ALTS>

<RETURN
```

```
                        AI101→
 UB191      UTC     SPD/ALT
ABB        1238  .78/FL330
                      13NM
(T/D)      1239  .79/FL330
 BIG1A    TRK320° 21
FIR96      1242310/*FL260

-----TOO STEEP PATH-----
 BIG1A
CLIFF      1246293/*FL120
 DEST   UTC  DIST EFOB
EGLL27R 1301  149   6.1
TOO STEEP PATH AHEAD ↑↓
```

F.PLN A PAGE WITH A TOO STEEP PATH

Procedure

When passing the first waypoint of the TOO STEEP PATH :

- **MONITOR VDEV and predictions at the next CSTR waypoint.**
- **If required, EXTEND the speedbrakes before seeing the "MORE DRAG" message.**
- **CONSIDER using a holding pattern, if necessary.**

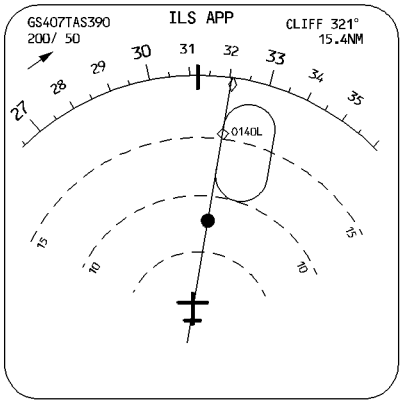
R HOLDING PATTERN

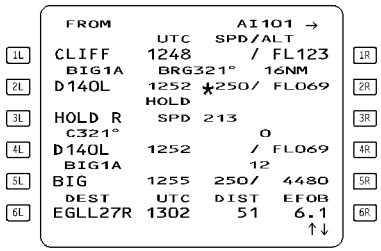
A hold may be required during the descent, and may be manually inserted.

Procedure

- **PRESS the F-PLN key.**
- **SELECT the lateral revision page.**
- **SELECT the HOLD prompt.**
- **CHECK the HOLDING data, and MODIFY it if necessary.**
- **CHECK the temporary flight plan and INSERT the holding pattern in it.**

Note : If the holding fix is close to the DECEL pseudo waypoint and the speed is managed, manually activate the approach phase to change the managed target speed to approach speed (VAPP). This will avoid having an increase of speed not appropriate.





NFC5-04-0560-009-A001AA

MANUAL TERMINATION

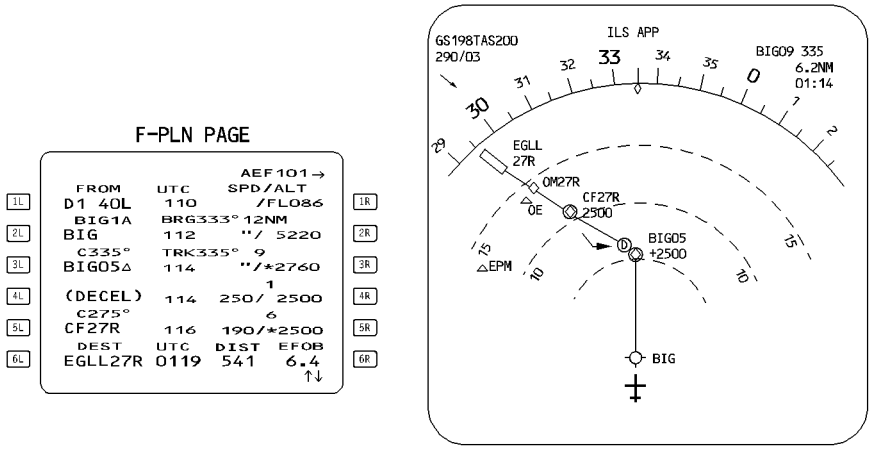
You should not use DES mode when entering a leg with manual termination. Manual termination, which is defined as a track or a heading with no termination, is always part of a database procedure.
The computed descent flight profile may not be adequate when flying this type of leg.

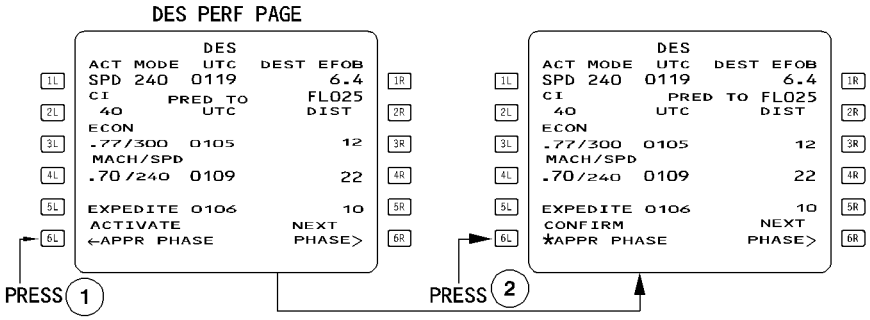
INITIAL APPROACH

UPON REACHING THE INITIAL APPROACH AREA

- Approach phase will activate automatically when flying over the DECEL pseudo waypoint with NAV, APPR NAV or LOC* or LOC mode engaged.
- You will activate manually the approach phase on the PERF page if :
  - HDG or TRK mode is engaged or
  - if you are flying a go around or
  - if an early deceleration is required

R

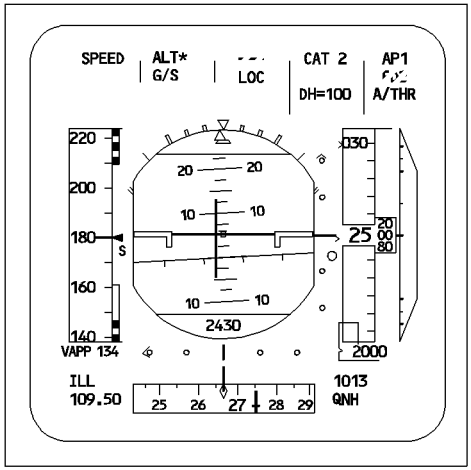




NFCS-04-0570-001-A001AA

MANAGED SPEED

– **CHECK that managed speed is active : MONITOR the target speed.**
During the approach, the autothrust limits the speed of the current configuration. (GD, S, F, VAPP).



NFC5-04-0570-002-A001AA

If ATC requires a specific speed :

– **SWITCH to selected speed (turn and pull the speed selector knob on the FCU).**

– **ADJUST the aircraft configuration accordingly.**

● **If ATC orders successive step descents down to the final approach flight path :**

– **Use the V/S or FPA mode.**

– **MONITOR VDEV.**

NAV ACCURACY

As required by the SOP.
Without installed GPS and when no DME is available for the accuracy check, use HIGH/LOW on the PROG page.
In this case, consider a "HIGH" to be equivalent to a positive crosscheck.

ATC CLEARANCE

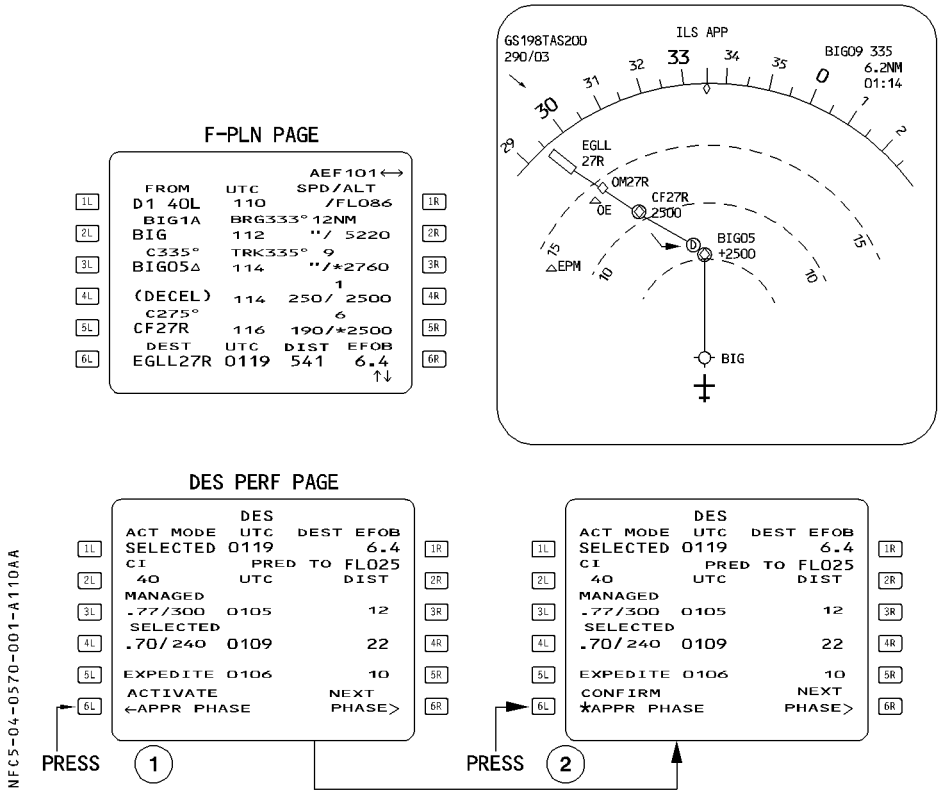
– **MODIFY the F-PLN, RAD NAV, and PERF APPR data to agree with the latest clearance and landing information.**

INITIAL APPROACH

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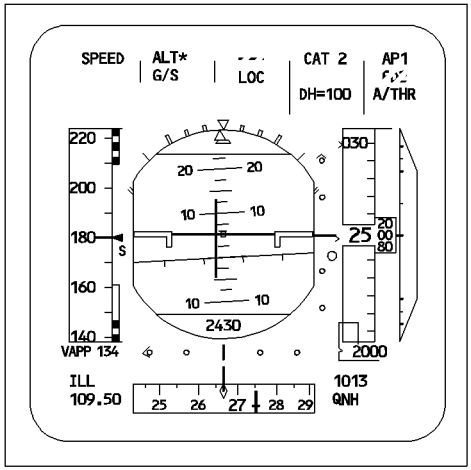
R



NFCS-04-0570-001-A110AA

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NFC5-04-0570-002-A001AA

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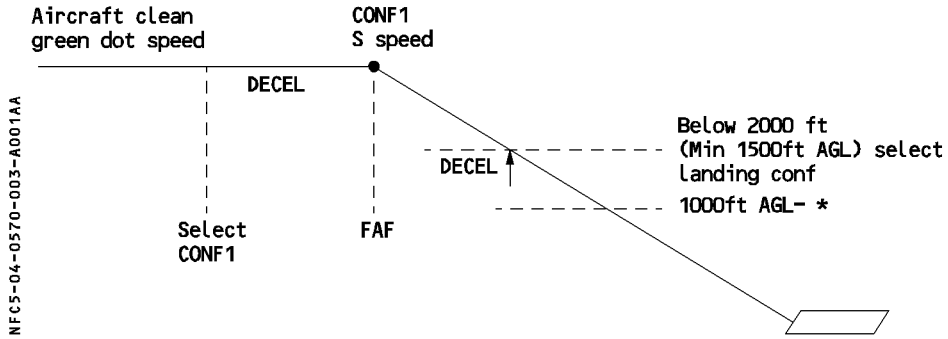
ILS APPROACH

INTERMEDIATE/FINAL APPROACH (ILS approach entered in the F-PLN)

The preferred technique for flying an ILS approach is to fly a decelerated approach using the AP/FDs, the LOC and G/S modes, A/THR in the SPEED mode, managed speed target is recommended.

Decelerated approach

The decelerated approach technique brings the aircraft down to 1 000 feet, at VAPP. In most cases, the interception of the final descent path is achieved with Conf 1 at S speed.



* The approach must be stabilized at approach speed (minimum ground speed) in the landing configuration before reaching 1 000 feet AGL.

APPROACH MODE ACTIVATION (LOC - G/S)

When cleared by ATC and when appropriate :

- **DEPRESS the APPR pushbutton to arm the APPR mode for the approach entered in the flight plan.**

  Note : If a NON PRECISION approach is selected in the active flight plan and if the pilot manually tunes an ILS on the RAD NAV page, the MCDU and PFD display "CHECK APPR GUIDANCE". This message is a reminder to the pilot that, although an ILS is tuned on RAD NAV page, the available approach guidance modes are APP NAV - FINAL when the APPR pushbutton is pressed in on the FCU.

The FCU APPR pushbutton arms or engages LOC and G/S modes, if :
- An ILS approach is entered in the flight plan, or
- No approach, or only a runway, is entered in the flight plan, and an ILS is manually-tuned on the RAD NAV page, or
- Both RMPs are set to NAV, and an ILS is selected.

AUTOLAND

– CHECK that the FMA displays the aircraft capability (CAT2 or CAT3) for the intended ILS approach.

– MONITOR the radio automatic callout.

- **At 350 feet RA :**

– CHECK that "LAND" is displayed on the FMA.

R If LAND is not displayed, do not perform an autoland. A go-around must be
R performed, if visual references are insufficient.

– CHECK ILS course.

- **Between 50 and 40 feet RA :**

– CHECK that "FLARE" is displayed on the FMA.

- **At approximately 30 feet RA :**

– CHECK that "IDLE" is displayed on the FMA, and that autothrust starts to reduce thrust toward IDLE.

- **At 10 feet, "RETARD" callout comes up :**

– MOVE the thrust levers to IDLE.
Autothrust disconnects.

- **At touchdown :**

– CHECK that "ROLL OUT" appears on the FMA.

- **At the end of the Rollout :**

– Disengage the autopilot.
If an AP is not disengaged at the end of the rollout, and the pilot uses the nosewheel steering tiller to taxi the aircraft off the runway, the autopilot will steer the aircraft back to the localizer when the tiller is released.

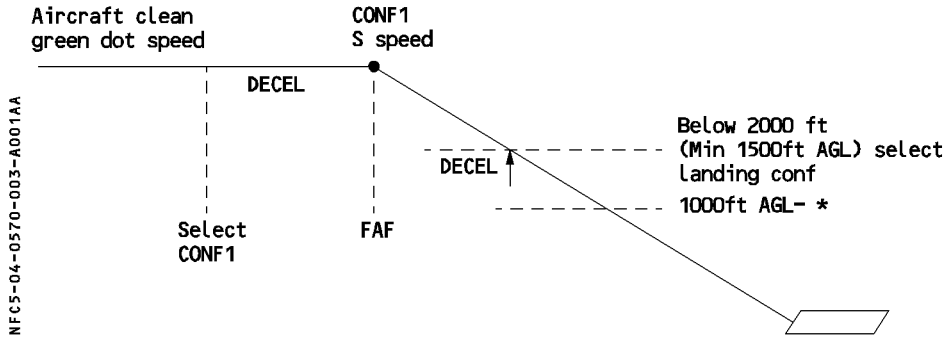
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When cleared by ATC and when appropriate :

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- **At 10 feet, "RETARD" callout comes up :**

  – MOVE the thrust levers to IDLE.
  Autothrust disconnects.

- **At touchdown :**

  – CHECK that "ROLL OUT" appears on the FMA.

- **At the end of the rollout :**
  Disconnect the autopilot.
  If the flight crew does not disconnect the AP at the end of the rollout, and uses the nosewheel steering handwheel to taxi the aircraft off the runway, the following will occur :
  – The AP will try to steer the aircraft back to the runway centerline, if the nosewheel steering handwheel is released and the aircraft heading is less than 20 degrees off the runway centerline.
  – The AP will automatically disconnect, if the aircraft heading is 20 degrees or more off the runway centerline.

MANUAL LANDING

- **at DH**

  – DISCONNECT the APs. SPEED mode remains engaged.

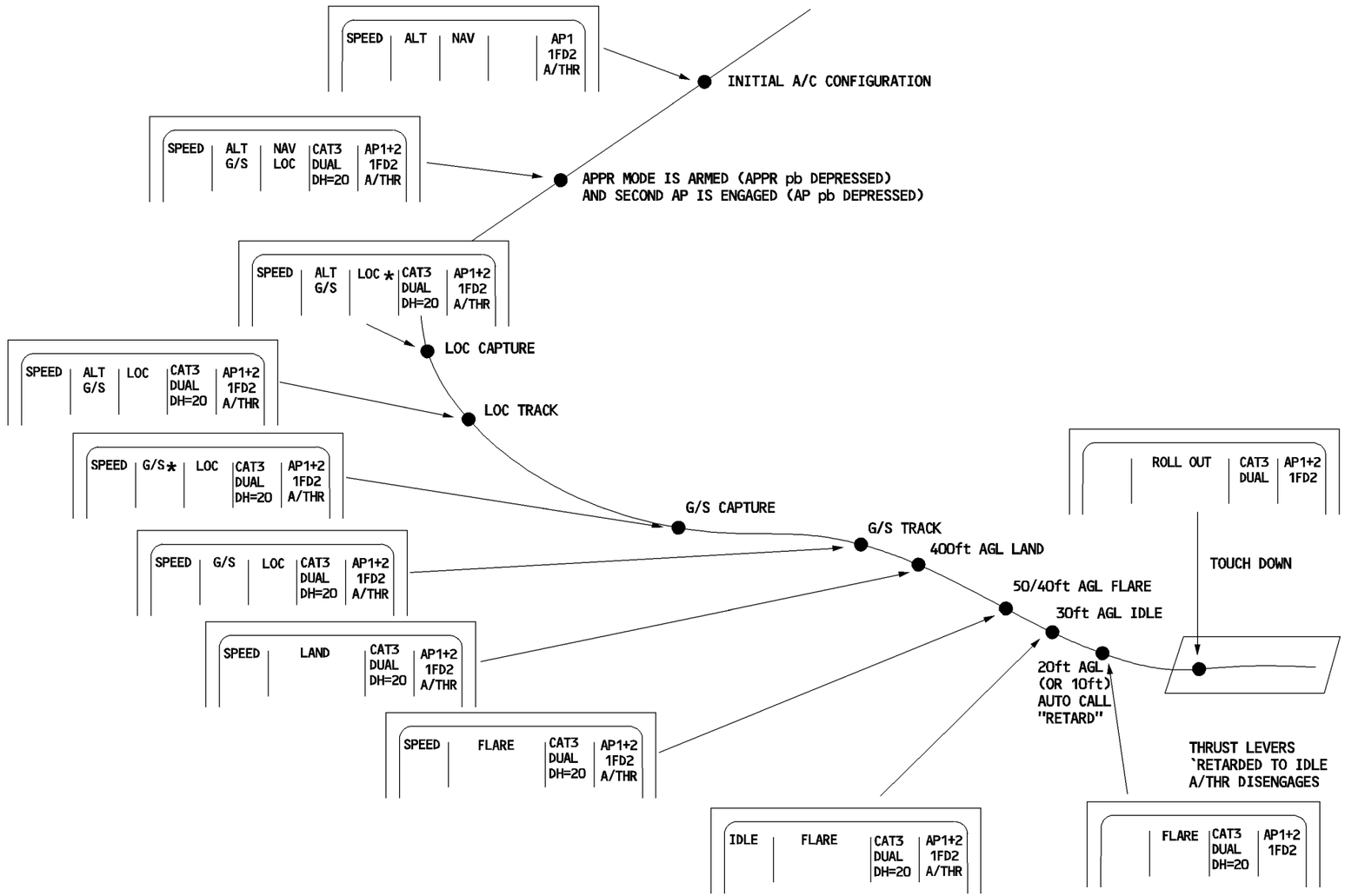
- **At 20 feet "RETARD" automatic call out comes up**

  – MOVE the thrust levers to IDLE if they are not there already. (The A/THR disconnects).

- **At touch down**
  "ROLL OUT" appears on the FMA and the yaw bar comes up on the PFD.

R *Note : The retard call out is only a reminder when a manual landing is performed.*

STANDARD ILS AUTOMATIC APPROACH



NFCS-04-0570-006-A110AA

LAN ALL

EARLY SELECTION OF APPROACH MODE LOC - G/S

Pressing the APPR pushbutton arms LOC and G/S.
The RA signal is not valid above 8200 feet AGL (TRT), or 5000 feet AGL (Collins). If the aircraft is cleared for an ILS approach, when it is higher than 8000 feet AGL or 5000 feet AGL (Collins), proceed as follows :

- **– PRESS the APPR pushbutton on the FCU.**
- **When aligned on the localizer, check LOC and G/S engagement :**
  - **– CAT 1 is displayed on the FMA. (Radio altimeters not yet valid).**
  - **– Check that the FMA displays the correct capability for the intended approach, when the aircraft is below 5000 feet AGL.**

GLIDESLOPE INTERCEPTION FROM ABOVE

If the aircraft is above the glideslope, the system will not capture the G/S automatically. The pilot must bring the aircraft onto the glideslope beam, and select an appropriate V/S to intercept it. Refer to the SOP.

DATA LOCK

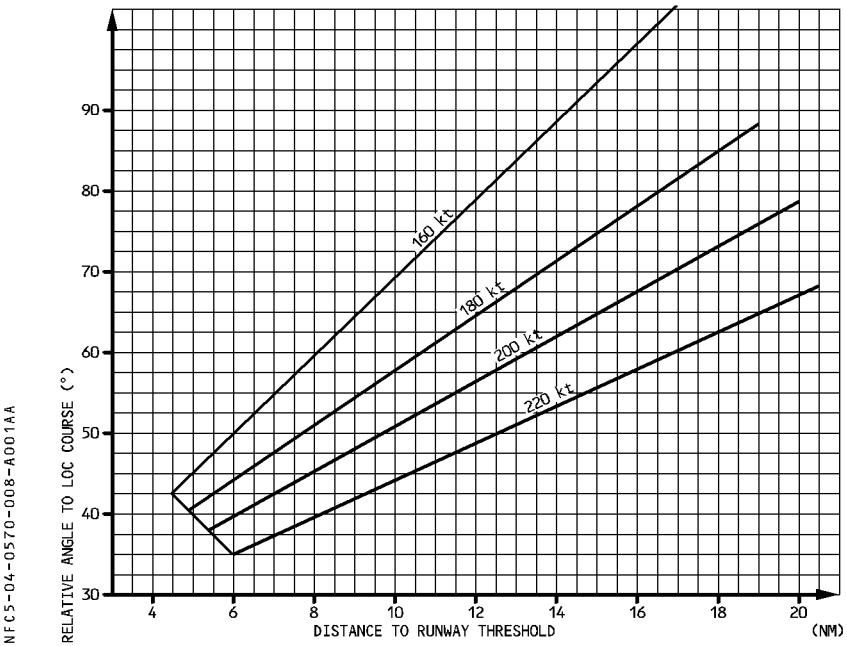
When the aircraft reaches 700 feet RA with APPR mode (LOC and G/S) armed or engaged, the ILS freq and course are frozen in the receiver.
This function (ILS tune inhibit) is available, when at least one AP/FD is engaged. Any attempt to change the ILS frequency or CRS, via the MCDU or RMP, does not affect the receiver.
If the speed is managed, the system does not accept any modifications the flight crew may enter on the PERF APPR page (surface wind, selected landing configuration, or VAPP) for speed guidance purposes below this altitude.
When the aircraft reaches 400 feet RA, LAND mode engages. The flight crew can only disengage this mode by engaging the GO AROUND mode.

USE of RMPs for ILS/DME

R If both FMGCs fail, the flight crew can use the RMPs (Radio Management Panels 1 and 2) for back up tuning. Either RMP controls ILS. Prior to select an ILS frequency on one of the RMPs, the flight crew has to select "NAV" button from RMP1 and RMP2.
R If the ILS has a DME, the PFD will not display the DME distance. In this situation, the flight crew will fly without DME information. If necessary, increase the Decision height (DH) accordingly.

R LOCALIZER (LOC) BEAM CAPTURE

R The flight crew must always monitor the capture of a LOC beam. During this evolution, the PFD and ND must indicate that associated deviation indications move toward the centre of the scale. To avoid performing a false capture, the flight crew must be careful not to arm the LOC to early.
R The following graph shows the angle of interception versus distance to the runway threshold that ensures that the aircraft will not overshoot the axis by more than one and a half dot.



The capture begins when the deviation is two dots or less. It is programmed to line the aircraft up on the beam with a single overshoot, even if the intercept angle is large.

Note : ICAO requires loc beam to ensure a normal capture within 10 NM and plus or minus 35 degrees from the course centerline. Some ILS systems just meet the requirement and are subject to false capture outside these limits.

SWITCHING FROM NON ILS TO ILS APPROACH

If an ILS approach is possible when a non ILS was previously scheduled, use one of the following procedures :

1. Use a secondary flight plan to prepare the alternate ILS approach, time permitting.

– COPY the ACTIVE flight plan.

– REVISE the ARRIVAL : insert the ILS approach and the applicable STAR/VIA.

– On the RAD NAV page, TUNE in the ILS manually.

– REVISE the PERF APPR page.

2. ATC changes the clearance from the non-ILS to the ILS approach.

- **If a secondary flight plan has been prepared :**

  – ACTIVATE the SEC F-PLN and adjust.

  – Follow subsequent standard procedures.

- **If a secondary flight plan has not been prepared :**

  – REVISE the ARRIVAL on the primary F-PLN, inserting the ILS approach.

  – REVISE the PERF APPR page.

  – Follow subsequent standard procedures.

CAUTION

If the pilot decides to fly the ILS approach without revising the arrival of the primary flight plan (a non ILS approach is in the F-PLN), LOC and G/S modes will not be available when he presses the APPR pushbutton.
Consequently, he should :
· Manually TUNE in the ILS on the RAD NAV page : CHECK that the "CHECK APPR GUIDANCE" message comes up.
· Press the ILS pushbutton and select ROSE ILS on the EIS CONTROL panel.
· Use HDG, V/S or TRK, FPA modes to fly the ILS.

TASK SHARING DURING CAT I, CAT II and CAT III APPROACH AND LANDING

FCOM 3.01.22 provides all limitations regarding CAT I, CAT II and CAT III approaches and landings. This includes precautions to be taken when performing autoland on CAT I ILS beam with good visibility.

Anytime a precision approach is performed the PNF must announce that a flight parameter is being exceeded, if :

- During glide beam capture
  - Pitch attitude becomes less than minus 2.5° or greater than plus 10° (nose up).
  - Vertical speed exceeds plus 500 feet/minute or minus 1 250 feet/minute.
- During final approach
  - Speed goes below speed target minus 5 knots or above speed target plus 10 knots (announce "SPEED").
  - Pitch attitude goes below minus 2.5° or above 10° (announce "PITCH")
  - Bank angle becomes greater than 7° (announce "BANK")
  - Descent rate becomes greater than 1 000 feet/minute (announce "SINK RATE")
  - There is too much LOC or GLIDE deviation (announce "LOCALIZER" or "GLIDE").

If the flight crew suspects that autopilot guidance is not effective, they should :

- Use the instinctive disconnect pushbutton to disconnect the autopilot, or
- Perform an automatic go-around.

The flight crew may perform a CAT II/CAT III approach, if :

- The FMA displays the corresponding category
- The required systems and functions are operative
- The airport is approved for the intended operations.
- They are qualified to perform the specific approach.

CAT III Approach

AUTO CALL OUT RA is mandatory
A/THR in SPEED MODE is mandatory.

Note : AUTO CALL OUT is not mandatory for CAT 2 approach : The PNF may perform this function.

SWITCHING FROM NON ILS TO ILS APPROACH

If an ILS approach is possible when a non ILS was previously scheduled, use one of the following procedures :

1. Use a secondary flight plan to prepare the alternate ILS approach, time permitting.

– COPY the ACTIVE flight plan.

– REVISE the ARRIVAL : insert the ILS approach and the applicable STAR/VIA.

– On the RAD NAV page, TUNE in the ILS manually.

– REVISE the PERF APPR page.

2. ATC changes the clearance from the non-ILS to the ILS approach.

- **If a secondary flight plan has been prepared :**

  – ACTIVATE the SEC F-PLN and adjust.

  – Follow subsequent standard procedures.

- **If a secondary flight plan has not been prepared :**

  – REVISE the ARRIVAL on the primary F-PLN, inserting the ILS approach.

  – REVISE the PERF APPR page.

  – Follow subsequent standard procedures.

CAUTION

If the pilot decides to fly the ILS approach without revising the arrival of the primary flight plan (a non ILS approach is in the F-PLN), LOC and G/S modes will not be available when he presses the APPR pushbutton.
Consequently, he should :
· Manually TUNE in the ILS on the RAD NAV page : CHECK that the CHECK APPR SELECTION message comes up.
· Press the ILS pushbutton and select ROSE ILS on the EIS CONTROL panel.
· Use HDG, V/S or TRK, FPA modes to fly the ILS.

TASK SHARING DURING CAT I, CAT II and CAT III APPROACH AND LANDING

FCOM 3.01.22 provides all limitations regarding CAT I, CAT II and CAT III approaches and landings. This includes precautions to be taken when performing autoland on CAT I ILS beam with good visibility.

Anytime a precision approach is performed the PNF must announce that a flight parameter is being exceeded, if :

- During glide beam capture
  - Pitch attitude becomes less than minus 2.5° or greater than plus 10° (nose up).
  - Vertical speed exceeds plus 500 feet/minute or minus 1 250 feet/minute.
- During final approach
  - Speed goes below speed target minus 5 knots or above speed target plus 10 knots (announce "SPEED").
  - Pitch attitude goes below minus 2.5° or above 10° (announce "PITCH")
  - Bank angle becomes greater than 7° (announce "BANK")
  - Descent rate becomes greater than 1 000 feet/minute (announce "SINK RATE")
  - There is too much LOC or GLIDE deviation (announce "LOCALIZER" or "GLIDE").

If the flight crew suspects that autopilot guidance is not effective, they should :

- Use the instinctive disconnect pushbutton to disconnect the autopilot, or
- Perform an automatic go-around.

The flight crew may perform a CAT II/CAT III approach, if :

- The FMA displays the corresponding category
- The required systems and functions are operative
- The airport is approved for the intended operations.
- They are qualified to perform the specific approach.

CAT III Approach

AUTO CALL OUT RA is mandatory
A/THR in SPEED MODE is mandatory.

Note : AUTO CALL OUT is not mandatory for CAT 2 approach : The PNF may perform this function.

TASK SHARING FOR CAT I APPROACH (or better)

R

PF	PNF
At 350 ft AGL (or RA)	
· Check ILS course on PFD · Announce "LAND" when displayed on FMA	
At Decision Altitude (or Decision height) + 100 ft*	
	· Announce "HUNDRED ABOVE"
At Decision Altitude (or Decision Height)*	
	· Announce "MINIMUM"
If external visual references are sufficient	
· Announce "CONTINUE"	
If automatic landing not performed	
· Disconnect the APs and perform the landing	· Monitor auto callouts or announce as appropriate : 300ft 200ft 100ft 50ft 30ft 20ft 10ft
· At "RETARD" annunciation, retard thrust levers to IDLE if not yet performed	
If automatic landing performed	
Refer to "Task Sharing for CAT III Approach/Landing without DH" : From 40 ft RA to Touchdown	
If external visual references are not sufficient	
· Announce "GO-AROUND, FLAPS" and execute	

(*) : Decision Height if QFE is used.

R *Note :* — *CAT I minimum (DH or DA) is always baro referenced and should be entered in*
R *the MDA/MDH field of the PERF APPR page. Auto callouts "HUNDRED ABOVE"*
R *and "MINIMUM" will not be provided.*
R — *These auto callouts "HUNDRED ABOVE" and "MINIMUM" are activated by the radio altimeter only when a DH is entered into the DH field of the PERF APPR page for precision approaches (CAT II, CAT III).*

TASK SHARING FOR CAT II APPROACH

R

PF	PNF
At 350 ft RA	
· Check ILS course on PFD · Commence outside scanning · Announce "LAND" when displayed on FMA	
At Decision Height + 100 ft	
	· Monitor auto callout "HUNDRED ABOVE"
At Decision Height	
	· Monitor auto callout "MINIMUM".
If external visual references are sufficient	
· Announce "CONTINUE"	
If Automatic landing not performed	
· Disconnect the AP's and perform the landing	· Monitor auto callouts or announce as appropriate : 200ft 100ft 50ft 30ft 20ft
· At "RETARD" annunciation, retard thrust levers to IDLE if not yet performed	10ft "RETARD" auto callout*
If Automatic landing is performed	
Refer to "Task Sharing for CAT III Approach/Landing without DH" : From 40 ft RA to Touchdown	
If external visual references are not sufficient	
· Announce "GO-AROUND, FLAPS" and execute	

* "RETARD" auto callout comes up at 10 feet if LAND mode is engaged with one or two APs engaged. Otherwise it is announced at 20 feet.

TASK SHARING FOR CAT I APPROACH (or better)

R

PF	PNF
At 350 feet AGL (or RA)	
· Check ILS course on PFD · Announce "LAND" when displayed on FMA	
At Decision Altitude (or Decision height) + 100 feet*	
	· Monitor or announce "HUNDRED ABOVE"
At Decision Altitude (or Decision Height)*	
	· Monitor or announce "MINIMUM"
If external visual references are sufficient	
· Announce "CONTINUE"	
<u>If automatic landing not performed</u>	
· Disconnect the APs and perform the landing	· Monitor auto callouts or announce, as appropriate : 300 feet 200 feet 100 feet 50 feet 30 feet 20 feet 10 feet
· At "RETARD" annunciation, retard thrust levers to IDLE if not yet performed	
<u>If automatic landing performed</u>	
Refer to "Task Sharing for CAT III Approach/Landing without DH" : From 40 ft RA to Touchdown	
If external visual references are <u>not</u> sufficient	
· Announce "GO-AROUND, FLAPS" and execute	

(*) : Decision Height, if QFE is used.

<u>Note</u> : – *CAT I minimum (DH or DA) is always baro-referenced and should be entered in the MDA/MDH field of the PERF APPR page.*
– *Pin programming enables operators to select the required callouts.*

TASK SHARING FOR CAT II APPROACH

R

PF	PNF
At 350 ft RA	
· Check ILS course on PFD · Commence outside scanning · Announce "LAND" when displayed on FMA	
At Decision Height + 100 ft	
	· Monitor auto callout "HUNDRED ABOVE"
At Decision Height	
	· Monitor auto callout "MINIMUM".
If external visual references are sufficient	
· Announce "CONTINUE"	
<u>If Automatic landing not performed</u>	
· Disconnect the AP's and perform the landing	· Monitor auto callouts or announce as appropriate : 200ft 100ft 50ft 30ft 20ft
· At "RETARD" annunciation, retard thrust levers to IDLE if not yet performed	10ft "RETARD" auto callout*
<u>If Automatic landing is performed</u>	
Refer to "Task Sharing for CAT III Approach/Landing without DH" : From 40 ft RA to Touchdown	
If external visual references are <u>not</u> sufficient	
· Announce "GO-AROUND, FLAPS" and execute	

* "RETARD" auto callout comes up at 10 feet if LAND mode is engaged with one or two APs engaged. Otherwise it is announced at 20 feet.

TASK SHARING FOR CAT III APPROACH WITH DH

R

PF	PNF
At 350 ft RA	
· Check ILS course on PFD · Commence outside scanning · Announce "LAND" when displayed on FMA	
At Decision Height + 100 ft	
	· Monitor auto callout "HUNDRED ABOVE"
At Decision Height	
	· Monitor auto callout "MINIMUM".
If external visual references are sufficient	
· Announce "CONTINUE"	
At 40 ft RA	
	· Check FLARE on FMA and announce
At 30 ft RA	
· Monitor thrust reduction and flare by flight instruments	· Monitor auto callouts
At 10 ft RA	
Auto callout "RETARD"	
· RETARD both thrust levers to IDLE · Monitor lateral guidance by external reference	· Monitor engines parameters
At TOUCH DOWN	
	· Check ROLL OUT on FMA and announce
· Select and control reverse thrust	· Check reverse green and announce · Announce 70 kt
· Disengage the APs at the end of the Roll out (when leaving the runway at the latest)	
If external visual references are not sufficient	
· Announce "GO-AROUND, FLAPS" and execute	

TASK SHARING FOR CAT III APPROACH/LANDING WITHOUT DH

R

PF	PNF
At 350 ft RA	
· Check ILS course on PFD · Announce "LAND" when displayed on FMA	
At 100 ft RA	
· If no failure is detected, announce "CONTINUE"	· Monitor auto callout
At 40 ft RA	
	· Check FLARE on FMA and announce
At 30 ft RA	
· Monitor thrust reduction and flare by flight instruments	· Monitor auto callouts
At 10 ft RA	
Auto callout "RETARD"	
· RETARD both thrust levers to IDLE · Monitor lateral guidance by external reference	· Monitor engines parameters
At TOUCH DOWN	
	· Check ROLL OUT on FMA and announce
· Select and control reverse thrust	· Check reverse green and announce · Announce 70 kt
· Disengage the APs at the end of the Roll out (when leaving the runway at the latest)	

R *Note : In case of CAT III without DH, the pilot should enter "NO" in the DH field of the MCDU to avoid false "HUNDRED ABOVE" or "MINIMUM" auto callouts which would not be applicable.*

LANDING CATEGORIES

Each FMGC computes its own landing category : CAT1, CAT2, CAT3 single, and CAT3 dual and displays the corresponding landing category on the FMAs.
Each category depends upon the availability of aircraft systems and functions.
When the landing category downgrades, a triple clic aural warning is activated.

FAIL-OPERATIONAL AUTOMATIC LANDING SYSTEM

An automatic landing system is fail-operational if, in the event of a failure below alert height, the remaining part of the automatic system allows the aircraft to complete the approach, flare, and landing. A CAT 3 DUAL system is a fail-operational automatic landing system.

Note : In the event of a failure, the automatic landing system operates as a fail-passive system.

FAIL-PASSIVE AUTOMATIC LANDING SYSTEM

An automatic landing system is fail-passive if, in the event of a failure, there is no significant out-of-trim condition or deviation of flight path or attitude, but the landing is not completed automatically. A CAT3 single system is a fail-passive automatic landing system.

Note : With a fail-passive automatic landing system the pilot assumes control of the aircraft after a failure.

Below 100 feet (radio altimeter), the FMGS freezes the landing capability until LAND mode is disengaged or both APs are off.
Therefore a failure occuring below 100 feet does not change the category of the system.

R ALERT HEIGHT

R The alert height is the height above touch down, above which a CAT3 autoland would be
R discontinued and a missed approach executed, if a failure occured in either the airplane
R systems or the relevant ground equipments.
R Below the alert height, if such a failure occurs, the flare, touchdown and roll out may be
R accomplished using the remaining automatic system.

WARNINGS FOR ILS APPROACH

AUTOLAND warning

With "LAND" or "FLARE" green on the FMA and at least one AP engaged, the AUTOLAND red light appears on the glareshield when the aircraft is below 200 feet RA and one of the following events occurs :

- The autopilots are lost, or
- The aircraft gets too far off the beam (LOC or G/S flash on PFD), or
- Loss of LOC signal above 15 feet, or loss of glide signal above 100 feet (transmitter or receivers).
- The difference between both radio altimeter indications is greater than 15 feet.

When the Autoland light comes on, Autoland must be discontinued (Refer to 4.05.70 p. 17, 18, 19).

Warning of excessive beam deviation

This warning is a flashing of the LOC and G/S scales on the PFD and ND ROSE ILS. It occurs whenever :

- G/S deviation is greater than 1 dot (above 100 feet RA).
- LOC deviation is greater than 1/4 dot (above 15 feet RA).

Warning associated with ILS "landing capability"

Any downgrading in the aircraft's capability for automatic approach and landing sounds a triple-click aural warning.

Failure of both localizer and glideslope receivers

The PFD and ND (rose ILS mode) display red LOC and G/S flags (if the ILS pushbutton has been pressed green). LOC and G/S scales disappear from the PFD.
If LOC or G/S modes are engaged and at least one AP/FD is engaged

- The AP disengages.
- The FD reverts to its HDG - V/S or TRK - FPA modes.

Failure of localizer or glideslope transmitter (when captured)

- The corresponding index is lost.
- The LOC and G/S scales flash.
- The corresponding FD bar flashes.

The FMA retains the LOC and G/S modes : If the transmitter failure is temporary, the APs are able to regain these modes. If the failure is long-term, or if it occurs when the aircraft is below 200 feet RA, this allows the aircraft to perform a GO AROUND with one or 2 autopilots engaged.

FAILURES AND ASSOCIATED ACTIONS ABOVE 1000 FT FOR CAT II or CAT III

R

FAILURE (for multiple failures, the most limiting applies)	ACTION TO BE PERFORMED ABOVE 1000 FT	LANDING CATEGORY
ONE ENGINE OUT	Complete ECAM procedure.	CAT III SINGLE
LANDING CAPABILITY DECREASE	Try to recover	As displayed on FMA
LOSS OF A/THR	Switch AP, and try to reengage	CAT II (if A/THR not recovered)
NOSE WHEEL STEERING		CAT III SINGLE (DH = 50 feet) Disengage AP at touch down
ANTI SKID		CAT III SINGLE Disengage AP at touch down
AMBER "CHECK ATT" ON TWO PFDs	Check with standby horizon, use switching to recover (no switching below 1000 feet)	CAT III SINGLE (if the warning disappears) CAT I (if not)
AMBER "CHECK HDG" ON TWO PFDs AND TWO NDs	Check with standby compass, use switching to recover (no switching below 1000 feet)	
RED "HDG" ON ONE PFD AND ONE ND	Use switching to recover (no switching below 1000 feet)	
RED "ATT" ON ONE PFD		
RED "SPD" ON ONE PFD		
DIAGONAL LINE ON ONE PFD AND ONE ND		
RED "RA" ON TWO PFDs	AP and FD not available	CAT I (minimum RVR as per regulation)
SLATS/FLAPS FAILURE (LESS THAN CONF 3)		CAT I Disengage AP at or above 500 feet

WARNINGS FOR ILS APPROACH

AUTOLAND warning

With "LAND" or "FLARE" green on the FMA and at least one AP engaged, the AUTOLAND red light appears on the glareshield when the aircraft is below 200 feet RA and one of the following events occurs :
- The autopilots are lost, or
- The aircraft gets too far off the beam (LOC or G/S flash on PFD), or
- Loss of LOC signal above 15 feet, or loss of glide signal above 100 feet (transmitter or receivers).
- The difference between both radio altimeter indications is greater than 15 feet.

When the Autoland light comes on, Autoland must be discontinued. See p. 17 to 19.

Warning of excessive beam deviation

This warning is a flashing of the LOC and G/S scales on the PFD and ND ROSE ILS. It occurs whenever :
- G/S deviation is greater than 1 dot (above 100 feet RA).
- LOC deviation is greater than 1/4 dot (above 15 feet RA).

Warning associated with ILS "landing capability"

Any downgrading in the aircraft's capability for automatic approach and landing sounds a triple-click aural warning.

Failure of both localizer and glideslope receivers

The PFD and ND (rose ILS mode) display red LOC and G/S flags (if the ILS pushbutton has been pressed green). LOC and G/S scales disappear from the PFD.
If LOC or G/S modes are engaged and at least one AP/FD is engaged.
- The AP disengages.
- The FD reverts to its HDG — V/S or TRK — FPA modes.

Failure of localizer or glideslope transmitter (when captured)

- The corresponding index is lost.
- The LOC and G/S scales flash.
- The corresponding FD bars flash.

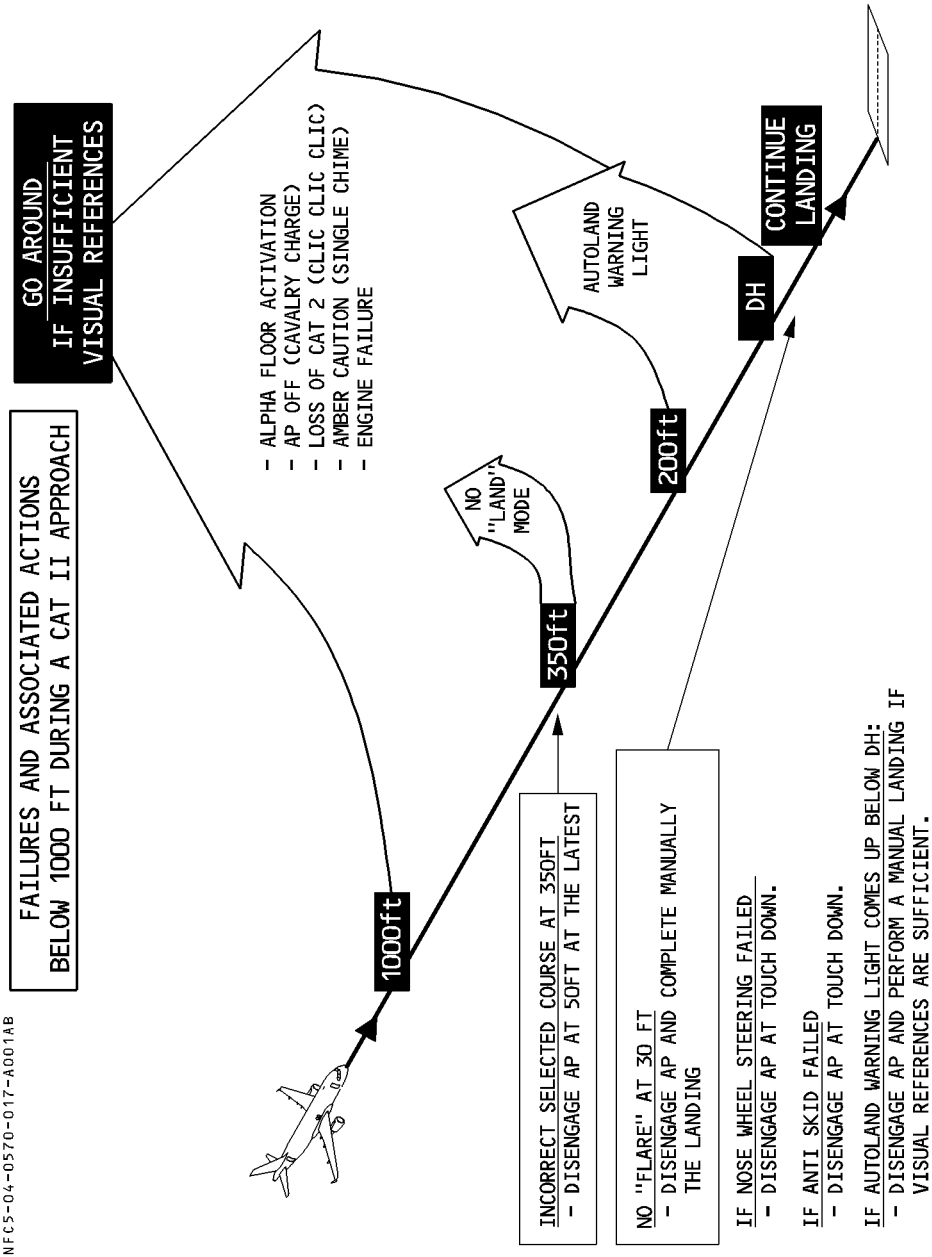
Above 200 feet RA, if the transmitter failure lasts less than 7 sec, the FMA retains the LOC and G/S modes (or the LAND mode) and the APs are able to regain these modes. If the failure lasts longer than 7 sec, the AP disengages and the FD reverts to its basic modes.
Below 200 feet RA, if the transmitter failure occurs, the AUTOLAND warning appears, indicating that the crew must perform a GO AROUND (if insufficient visual references) with one or 2 APs engaged.

FAILURES AND ASSOCIATED ACTIONS ABOVE 1000 FT FOR CAT II or CAT III

R

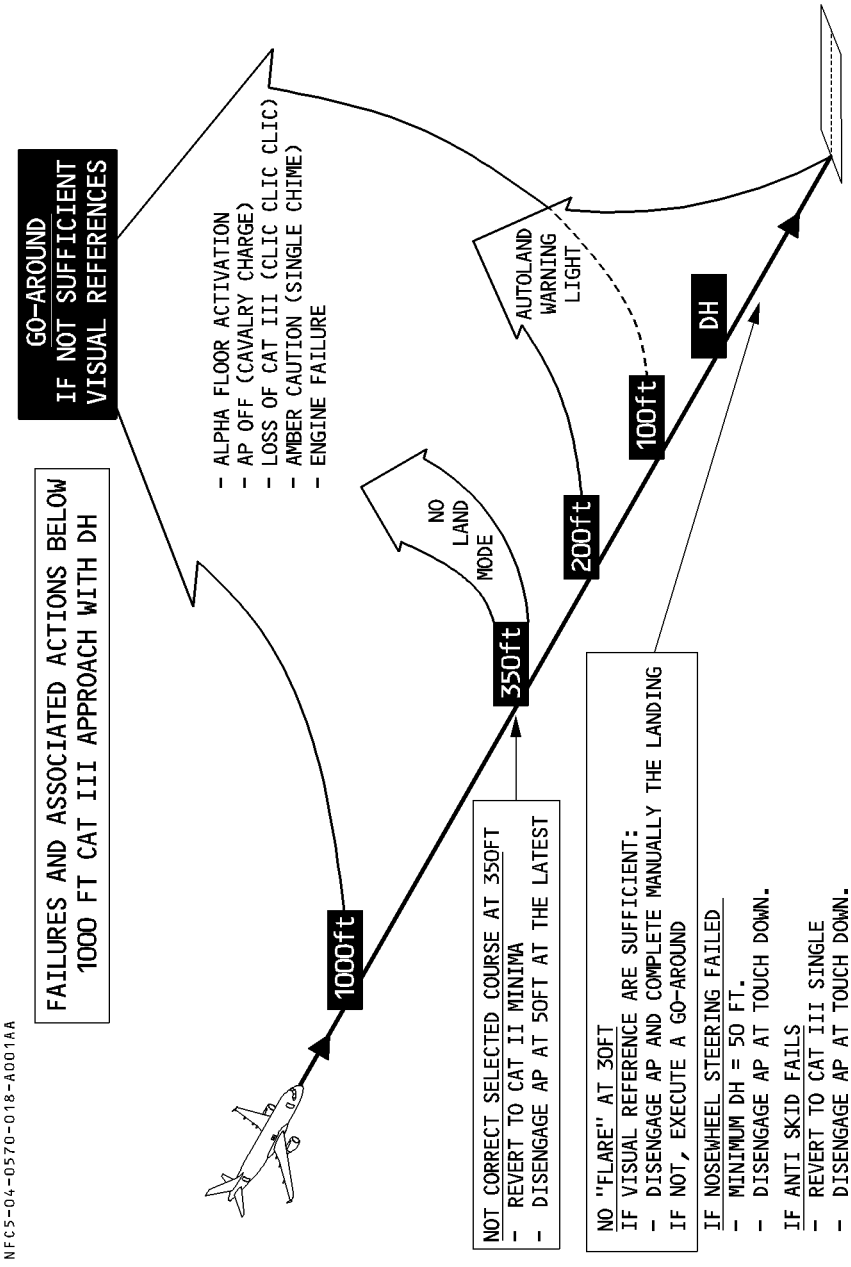
FAILURE (for multiple failures, the most limiting applies)	ACTION TO BE PERFORMED ABOVE 1000 FT	LANDING CATEGORY
ONE ENGINE OUT	Complete ECAM procedure.	CAT III SINGLE
LANDING CAPABILITY DECREASE	Try to recover	As displayed on FMA
LOSS OF A/THR	Switch AP, and try to reengage	CAT II (if A/THR not recovered)
NOSE WHEEL STEERING		CAT III SINGLE (DH = 50 feet) Disengage AP at touch down
ANTI SKID		CAT III SINGLE Disengage AP at touch down
AMBER "CHECK ATT" ON TWO PFDs	Check with standby horizon, use switching to recover (no switching below 1000 feet)	CAT III SINGLE (if the warning disappears) CAT I (if not)
AMBER "CHECK HDG" ON TWO PFDs AND TWO NDs	Check with standby compass, use switching to recover (no switching below 1000 feet)	
RED "HDG" ON ONE PFD AND ONE ND	Use switching to recover (no switching below 1000 feet)	
RED "ATT" ON ONE PFD		
RED "SPD" ON ONE PFD		
DIAGONAL LINE ON ONE PFD AND ONE ND		
RED "RA" ON TWO PFDs	AP and FD not available	CAT I (minimum RVR as per regulation)
SLATS/FLAPS FAILURE (LESS THAN CONF 3)		CAT I Disengage AP at or above 500 feet

R

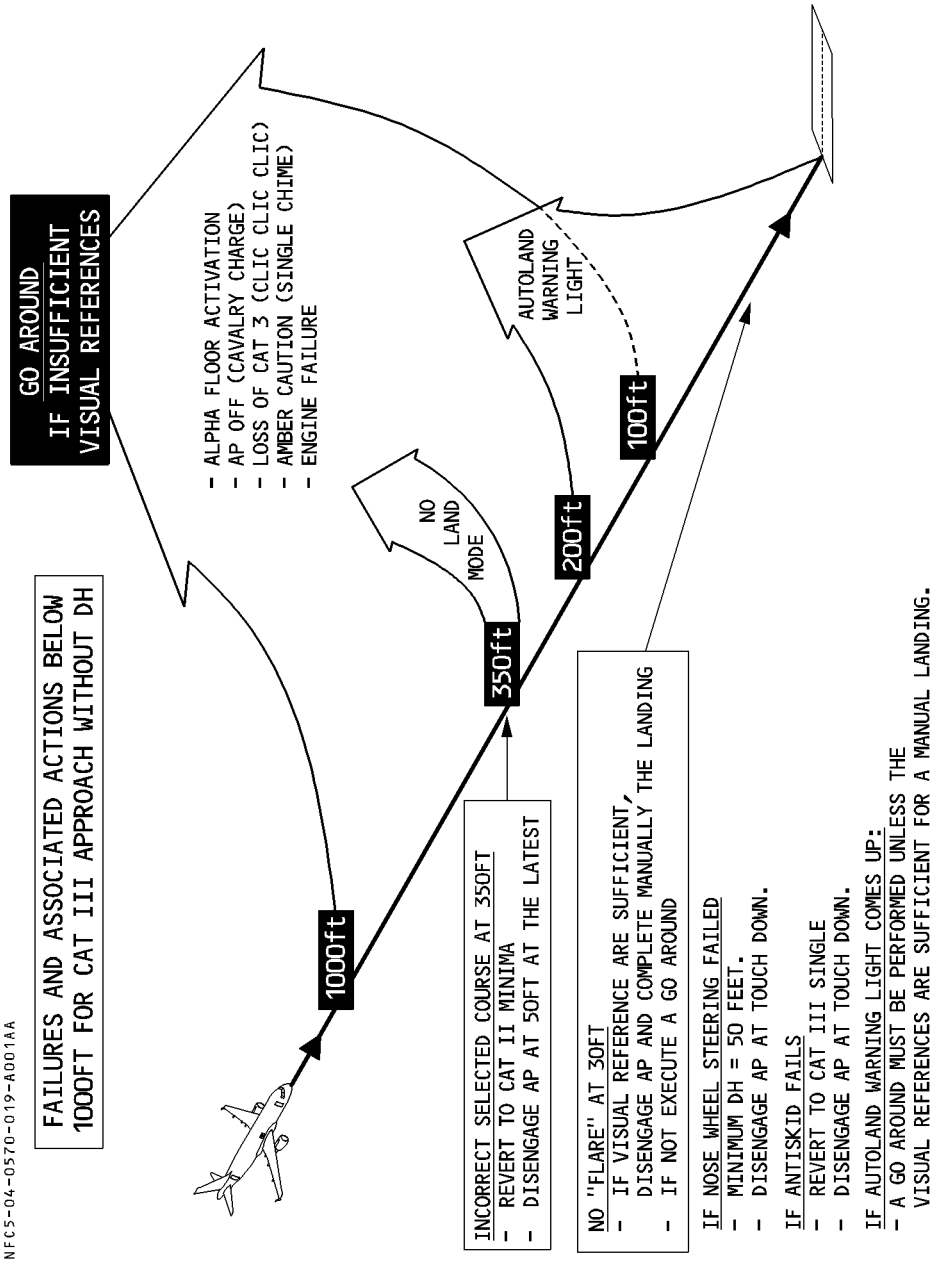


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FAILURES AND ASSOCIATED ACTIONS BELOW
1000 FT CAT III APPROACH WITH DH
GO-AROUND
IF NOT SUFFICIENT
VISUAL REFERENCES
- ALPHA FLOOR ACTIVATION
- AP OFF (CAVALRY CHARGE)
- LOSS OF CAT III (CLIC CLIC CLIC)
- AMBER CAUTION (SINGLE CHIME)
- ENGINE FAILURE
NO
LAND
MODE
AUTOLAND
WARNING
LIGHT
1000ft
350ft
200ft
100ft
DH
NOT CORRECT SELECTED COURSE AT 350FT
- REVERT TO CAT II MINIMA
- DISENGAGE AP AT 50FT AT THE LATEST
NO "FLARE" AT 30FT
IF VISUAL REFERENCE ARE SUFFICIENT:
- DISENGAGE AP AND COMPLETE MANUALLY THE LANDING
IF NOT, EXECUTE A GO-AROUND
IF NOSEWHEEL STEERING FAILED
- MINIMUM DH = 50 FT.
- DISENGAGE AP AT TOUCH DOWN.
IF ANTI SKID FAILS
- REVERT TO CAT III SINGLE
- DISENGAGE AP AT TOUCH DOWN.
IF AUTOLAND WARNING LIGHT COMES ON BELOW DH:
- A GO-AROUND MUST BE PERFORMED UNLESS THE
VISUAL REFERENCES ARE SUFFICIENT FOR A MANUAL LANDING.
NFC5-04-0570-018-A001AA

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FAILURES AND ASSOCIATED ACTIONS BELOW 1000FT FOR CAT III APPROACH WITHOUT DH
GO AROUND IF INSUFFICIENT VISUAL REFERENCES
- ALPHA FLOOR ACTIVATION
- AP OFF (CAVALRY CHARGE)
- LOSS OF CAT 3 (CLIC CLIC CLIC)
- AMBER CAUTION (SINGLE CHIME)
- ENGINE FAILURE
NO LAND MODE
AUTOLAND WARNING LIGHT
1000ft
350ft
200ft
100ft
INCORRECT SELECTED COURSE AT 350FT
- REVERT TO CAT II MINIMA
- DISENGAGE AP AT 50FT AT THE LATEST
NO "FLARE" AT 30FT
- IF VISUAL REFERENCE ARE SUFFICIENT, DISENGAGE AP AND COMPLETE MANUALLY THE LANDING
- IF NOT EXECUTE A GO AROUND
IF NOSE WHEEL STEERING FAILED
- MINIMUM DH = 50 FEET.
- DISENGAGE AP AT TOUCH DOWN.
IF ANTISKID FAILS
- REVERT TO CAT III SINGLE
- DISENGAGE AP AT TOUCH DOWN.
IF AUTOLAND WARNING LIGHT COMES UP:
- A GO AROUND MUST BE PERFORMED UNLESS THE VISUAL REFERENCES ARE SUFFICIENT FOR A MANUAL LANDING.
NFC5-04-0570-019-A001AA

BACK-COURSE LOCALIZER APPROACH

The pilot must fly a back-course localizer approach with the ND in its ILS rose mode.

Procedure

– **PRESS the RAD NAV key.**

– **ENTER the ILS IDENT.**
If the ILS is in the database, the system tunes the proper frequency and the front course.

Note : This may trigger the "RWY/ILS MISMATCH" message. Disregard it.

● **If the ILS is not in the database**

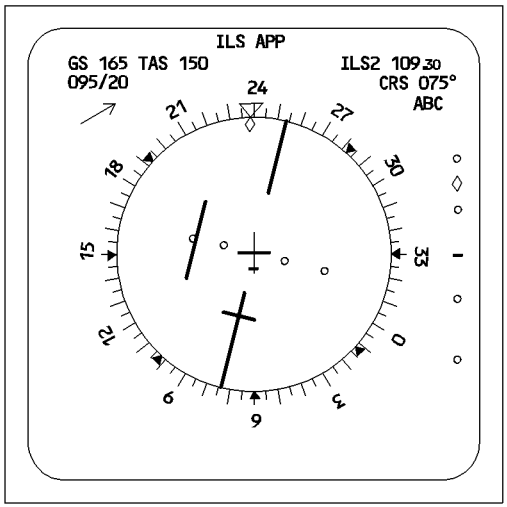
– **SET the appropriate frequency and SET the FRONT CRS into the CRS field.**

– **On the EFIS control panel, SELECT the ILS ROSE mode.**
The display shows the correct LEFT/RIGHT information for the beam deviation

CAUTION

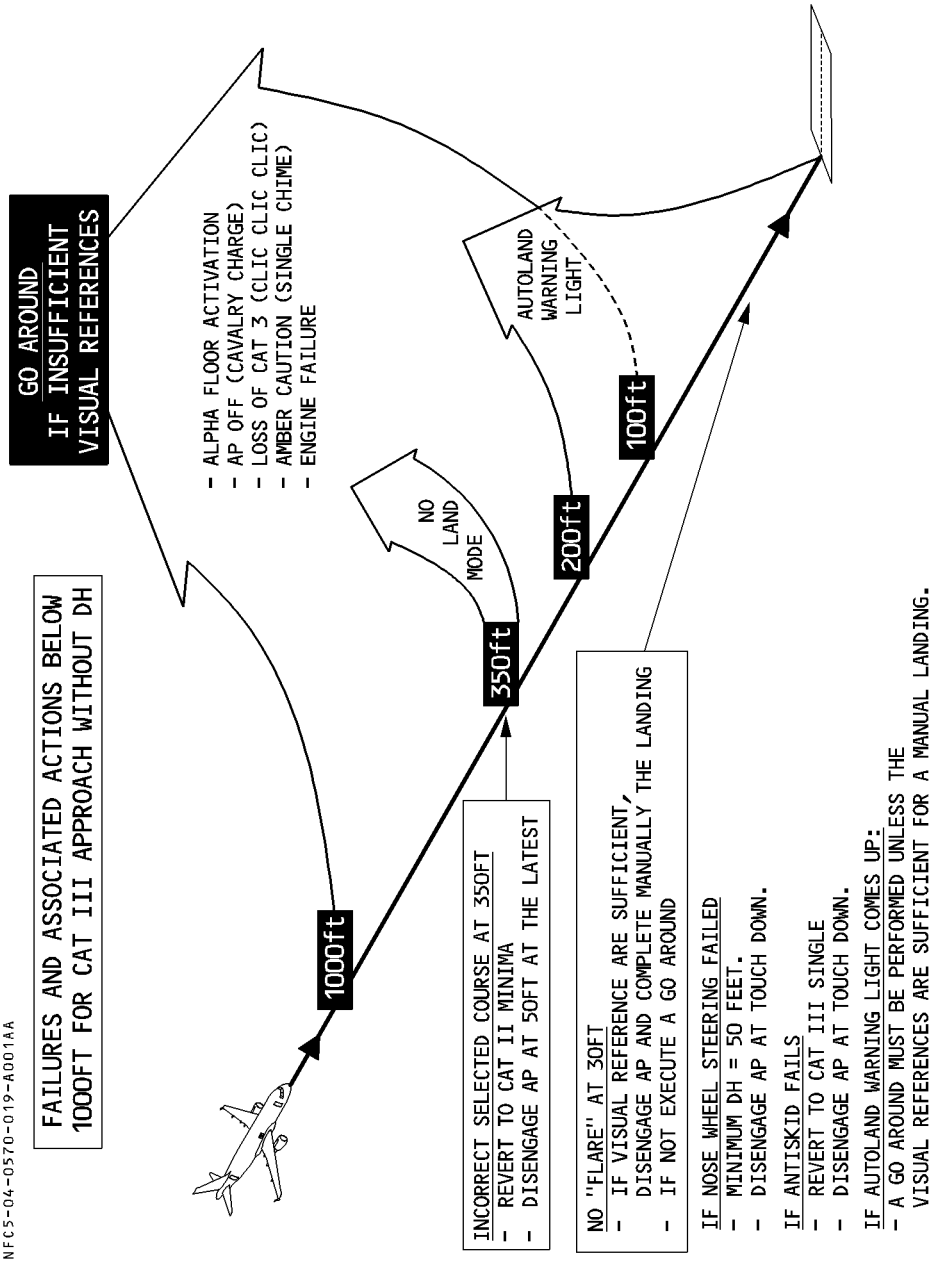
DO NOT select ILS through the ILS pushbutton switch : doing so makes the PFD show reverse deviations.
DO NOT arm the LOC or APPR modes.

– **The flight director may be used with the TRK-FPA or HDG - V/S modes.**



NFC5-04-0570-020-A001AA

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FAILURES AND ASSOCIATED ACTIONS BELOW
1000FT FOR CAT III APPROACH WITHOUT DH
GO AROUND
IF INSUFFICIENT
VISUAL REFERENCES
- ALPHA FLOOR ACTIVATION
- AP OFF (CAVALRY CHARGE)
- LOSS OF CAT 3 (CLIC CLIC CLIC)
- AMBER CAUTION (SINGLE CHIME)
- ENGINE FAILURE
AUTOLAND
WARNING
LIGHT
NO
LAND
MODE
1000ft
350ft
200ft
100ft
INCORRECT SELECTED COURSE AT 350FT
- REVERT TO CAT II MINIMA
- DISENGAGE AP AT 50FT AT THE LATEST
NO "FLARE" AT 30FT
- IF VISUAL REFERENCE ARE SUFFICIENT,
DISENGAGE AP AND COMPLETE MANUALLY THE LANDING
- IF NOT EXECUTE A GO AROUND
IF NOSE WHEEL STEERING FAILED
- MINIMUM DH = 50 FEET.
- DISENGAGE AP AT TOUCH DOWN.
IF ANTISKID FAILS
- REVERT TO CAT III SINGLE
- DISENGAGE AP AT TOUCH DOWN.
IF AUTOLAND WARNING LIGHT COMES UP:
- A GO AROUND MUST BE PERFORMED UNLESS THE
VISUAL REFERENCES ARE SUFFICIENT FOR A MANUAL LANDING.
NFC5-04-0570-019-A001AA

BACK-COURSE LOCALIZER APPROACH

The pilot must fly a back-course localizer approach with the ND in its ILS rose mode.

Procedure

– **PRESS the RAD NAV key.**

– **ENTER the ILS IDENT.**
If the ILS is in the database, the system tunes the proper frequency and the front course.

Note : This may trigger the "RWY/ILS MISMATCH" message. Disregard it.

● **If the ILS is not in the database :**

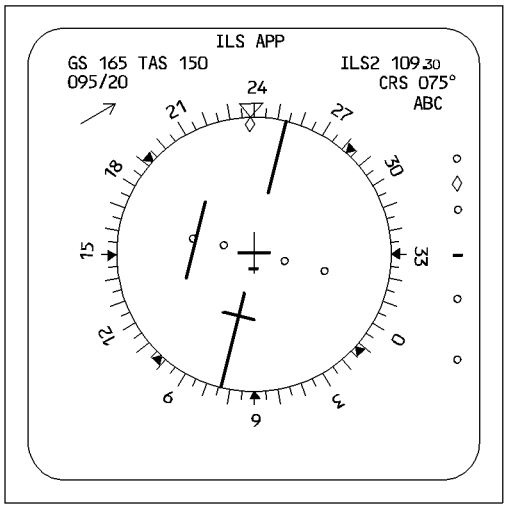
– **SET the appropriate frequency and SET the FRONT CRS in the CRS field.**

– **On the EFIS control panel, SELECT the ILS ROSE mode.**
The display shows the correct LEFT/RIGHT information for the beam deviation.

CAUTION

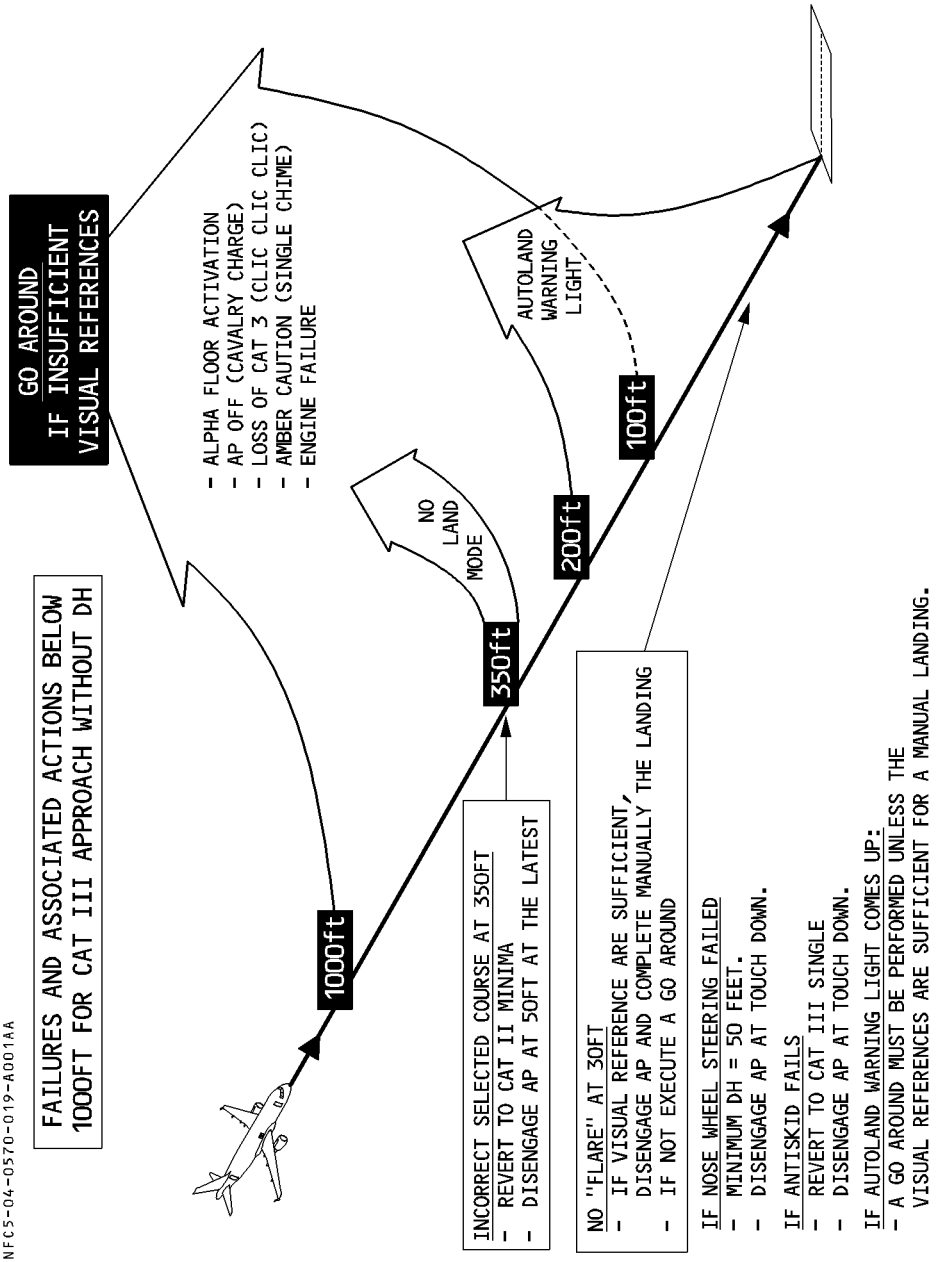
DO NOT select ILS via the LS pushbutton. Doing so makes the PFD show reverse deviations.
DO NOT arm the LOC or APPR modes.

– **The flight director may be used with the TRK-FPA or HDG - V/S modes.**



NFC5-04-0570-020-A100AA

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FAILURES AND ASSOCIATED ACTIONS BELOW
1000FT FOR CAT III APPROACH WITHOUT DH
GO AROUND
IF INSUFFICIENT
VISUAL REFERENCES
- ALPHA FLOOR ACTIVATION
- AP OFF (CAVALRY CHARGE)
- LOSS OF CAT 3 (CLIC CLIC CLIC)
- AMBER CAUTION (SINGLE CHIME)
- ENGINE FAILURE
AUTOLAND
WARNING
LIGHT
NO
LAND
MODE
1000ft
350ft
200ft
100ft
INCORRECT SELECTED COURSE AT 350FT
- REVERT TO CAT II MINIMA
- DISENGAGE AP AT 50FT AT THE LATEST
NO "FLARE" AT 30FT
- IF VISUAL REFERENCE ARE SUFFICIENT,
DISENGAGE AP AND COMPLETE MANUALLY THE LANDING
- IF NOT EXECUTE A GO AROUND
IF NOSE WHEEL STEERING FAILED
- MINIMUM DH = 50 FEET.
- DISENGAGE AP AT TOUCH DOWN.
IF ANTISKID FAILS
- REVERT TO CAT III SINGLE
- DISENGAGE AP AT TOUCH DOWN.
IF AUTOLAND WARNING LIGHT COMES UP:
- A GO AROUND MUST BE PERFORMED UNLESS THE
VISUAL REFERENCES ARE SUFFICIENT FOR A MANUAL LANDING.
NFC5-04-0570-019-A001AA

BACK-COURSE LOCALIZER APPROACH

The pilot must fly a back-course localizer approach with the ND in its ILS rose mode.

Procedure

– **PRESS the RAD NAV key.**

– **ENTER the ILS IDENT.**
If the ILS is in the database, the system tunes the proper frequency and the front course.

Note : This may trigger the "RWY/ILS MISMATCH" message. Disregard it.

● **If the ILS is not in the database :**

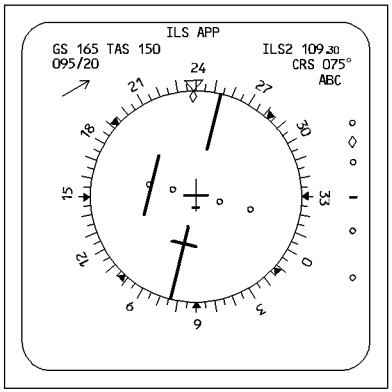
– **SET the appropriate frequency and SET the FRONT CRS in the CRS field.**

– **On the EFIS control panel, SELECT the ILS ROSE mode.**
The display shows the correct LEFT/RIGHT information for the beam deviation.

CAUTION

DO NOT select ILS via the LS pushbutton : Doing so makes the PFD show reverse deviations.
DO NOT arm the LOC or APPR modes.
DO NOT select the LS pushbutton on ISIS, since it displays the LOC deviations in the wrong sense.

– **The flight director may be used with the TRK-FPA or HDG - V/S modes.**



NFCS-04-0570-020-A200AA

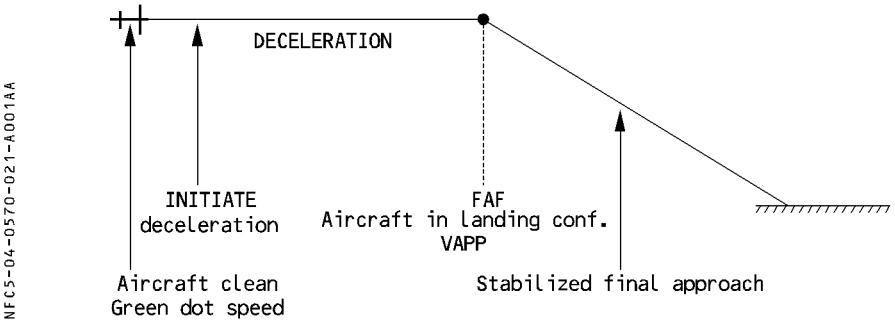
NON PRECISION APPROACH

APPROACH SPEED TECHNIQUE

Airbus recommends the stabilized approach procedure to perform non precision approaches.

STABILIZED APPROACH

The "stabilized approach" brings the aircraft to intercept the final descent path in the landing configuration and at VAPP.
Managed speed is best for the stabilized approach and VAPP should be inserted as a speed constraint at the final approach fix.



R **MANAGED NON PRECISION APPROACH**

R The Non Precision Approach (NPA) can be flown in lateral and vertical managed guidance
R (FINAL APP), or in lateral managed guidance (NAV) associated with selected vertical
R guidance (FPA of V/S).

R *Note : For the conditions for using these AP modes, refer to FCOM 3.01.22 and 3.03.19.*

R **APPROACH PREPARATION**

R **– SELECT the intended approach on the F-PLN page.**
R Check the FM lateral and vertical flight path against the published approach chart, using
R the MCDU and the ND PLAN mode with constraints displayed.

R **– ENTER VAPP as SPD constraint at the FAF, with a vertical revision of the F-PLN**
R **page.**
R * For an approach in overlay to a conventional approach with radio navaid :
R – SELECT/CHECK that the appropriate navaid is selected on the RAD NAV page.
R * For RNAV or GPS approach, GPS PRIMARY must be available at the ETA at
R destination. For more information about this check, refer to FCOM 3.03.19.

R **INTERMEDIATE APPROACH**

R **– SELECT ROSE NAV or MAP mode, and VOR or ADF raw data, as appropriate on the**
R **ND.**
R * For RNAV or GPS approach :
R – CHECK that both GPS receivers are operative in NAV mode on the GPS MONITOR
R page.
R – CHECK that GPS PRIMARY is available on the PROG PAGE.

R **– SELECT TRK/FPA display, when established on the final approach course.**

R **– USE managed speed.**

R **– KEEP A/THR active.**

R *Note : For additional recommendations, refer to the dedicated FCOM Bulletin on the use*
R *of the FINAL APP mode.*

FINAL APPROACH

When cleared for approach :

* If managed lateral and vertical guidance is intended :
  - SELECT APPR pushbutton on the FCU.
  - CHECK APP NAV green and FINAL blue on the FMA.
  - CHECK that blue descent arrow is displayed on ND at the FAF.
  - CHECK that the F-PLN on ND and the V-DEV on PFD are correct.

  After sequencing the FAF :
  - CHECK that FINAL APP green is displayed on the FMA.
  - CHECK on the ND to TO waypoint, the F-PLN to the MAP and the missed approach procedure (blue line).
  - SELECT the go-around altitude on the FCU.
  - MONITOR the approach lateral and vertical flight path with the available raw data.
* If managed lateral and selected vertical guidance is intended :
  - CHECK NAV and FPA on the FMA.

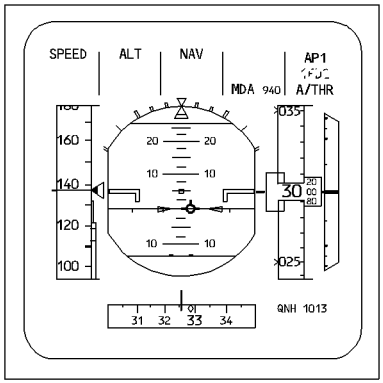
  Upon reaching the FAF :
  - Select a FPA to the final descent path.
    Anticipate the selection of the FPA to smoother the interception of the final descent path.

  After sequencing the FAF :
  - CHECK, on the ND, the TO waypoint, the F-PLN to the MAP, and the missed approach procedure (blue line).
  - SELECT the go-around altitude on the FCU.
  - ADJUST the FPA to fly the intended vertical flight path.

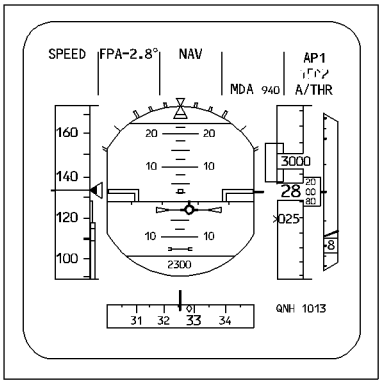
– At MDA/MDH :

* If visual references are acquired and confirmed by both crewmembers :
  - DISCONNECT the AP and FD and continue visually.
* If visual references are not acquired :
  - INITIATE a go-around.

R NON PRECISION APPROACH - MANAGED LATERAL SELECTED VERTICAL GUIDANCE
R



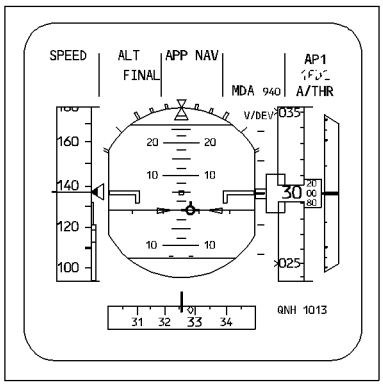
PFD in intermediate approach, FPD and FPV selected. The pilot did not press the APPR pushbutton, the V DEV scale is not displayed.(If GPS is installed, the V DEV scale is displayed when the approach phase is active).



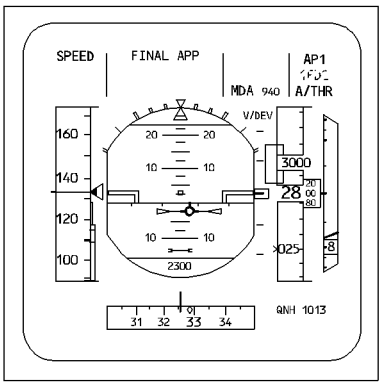
PFD when established on final path: The vertical guidance is the final path angle, as selected by the pilot (FPA); the lateral guidance is computed by the FM (NAV).

NFC5-04-0570-023-A100AA

R NON PRECISION APPROACH - LATERAL AND VERTICAL MANAGED GUIDANCE
R



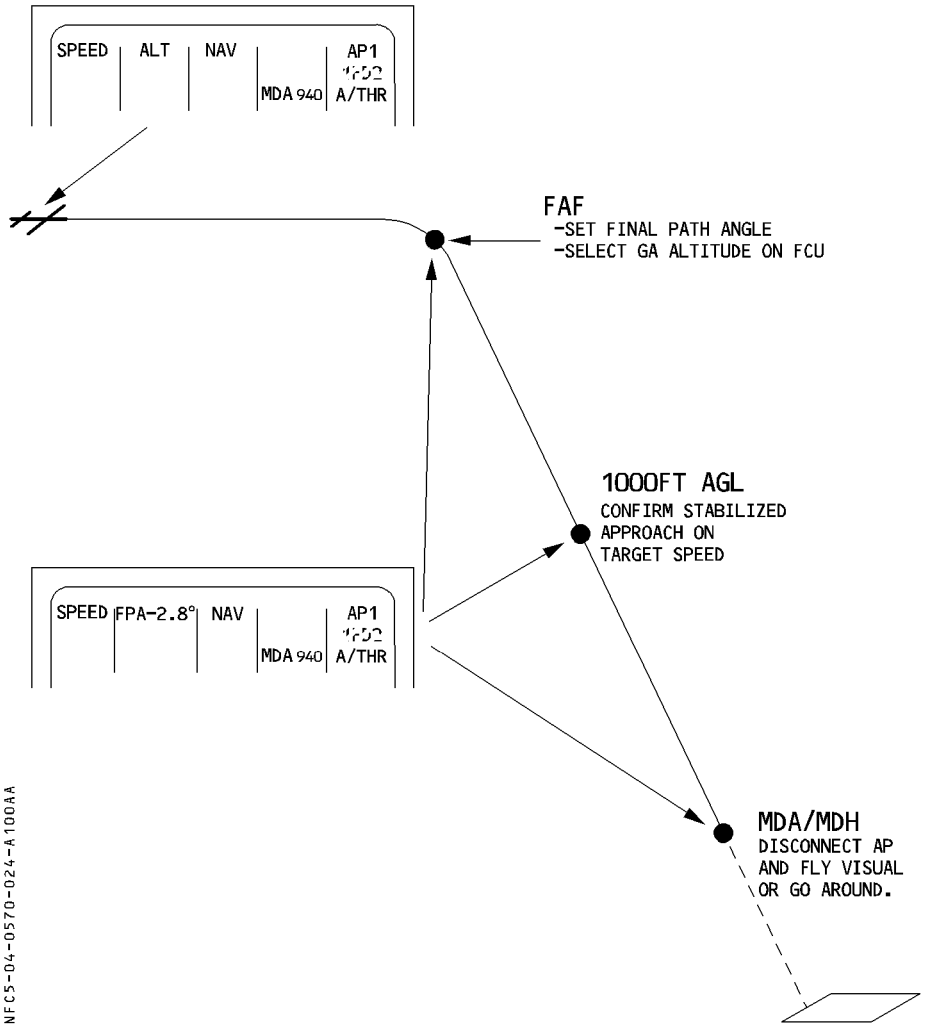
PFD in intermediate approach, FPD and FPV selected. The pilot has pressed the APPR pushbutton, the FINAL managed mode is armed, the V DEV scale is displayed.(If GPS is installed, the V DEV scale is displayed when the approach phase is active).
Each V DEV graduation indicates 100 feet, the rectangle shows the computed vertical path versus the aircraft position.



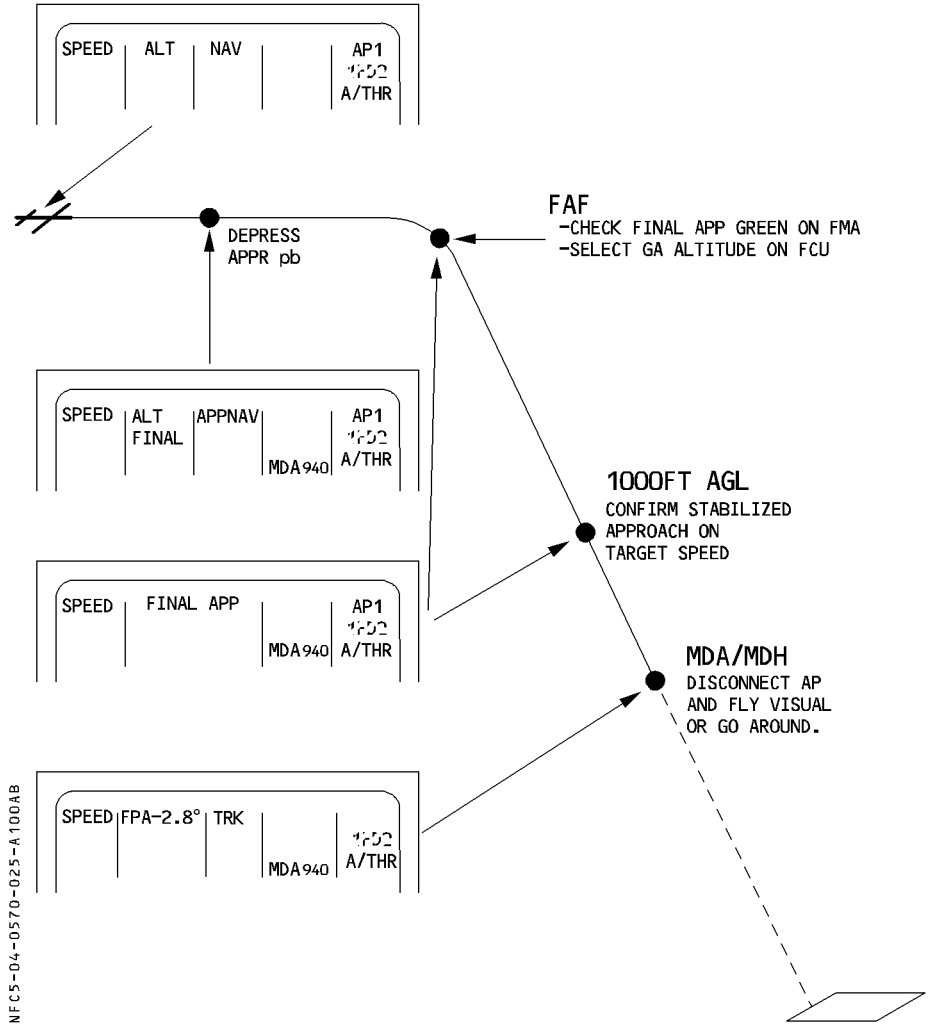
PFD when established on final path: The lateral and vertical guidances are managed by the FM (FINAL APP).

NFC5-04-0570-023-B100AA

R **NON PRECISION APPROACH PROFILE - MANAGED LATERAL AND SELECTED VERTICAL**
R **GUIDANCE**
R



R **NON PRECISION APPROACH PROFILE - LATERAL AND VERTICAL MANAGED GUIDANCE**
R



CAUTION

When FINAL APP NAV modes are engaged, the AP/FD will disengage at MDA/MDH (if entered) or Missed Approach Point, whichever comes first.

R The FDs will revert to basic modes (HDG-V/S or TRK-FPA).

SELECTED NON PRECISION APPROACH

The non precision approach is flown in selected modes (TRK-FPA or HDG-V/S) when :
* the approach is not stored in the database or
* GPS PRIMARY is lost and the nav accuracy check is negative.

INTERMEDIATE APPROACH

Procedure

– USE TRK-FPA mode

– SELECT ND in the ROSE VOR mode

– KEEP the autothrust active

– USE managed speed

FINAL APPROACH

Upon reaching the final approach fix

– SELECT a final approach track on the FCU

– SELECT an FPA (flight path angle) to the final descent path angle
Anticipate the selection of FPA to smooth the interception of the final path.

Note : If the pilot is using the AP, select the final FPA approximately 0.3 NM before the final approach fix.

– SELECT a go around altitude on FCU.

– USE raw data to monitor aircraft position and flight path.

– AT MDA/MDH

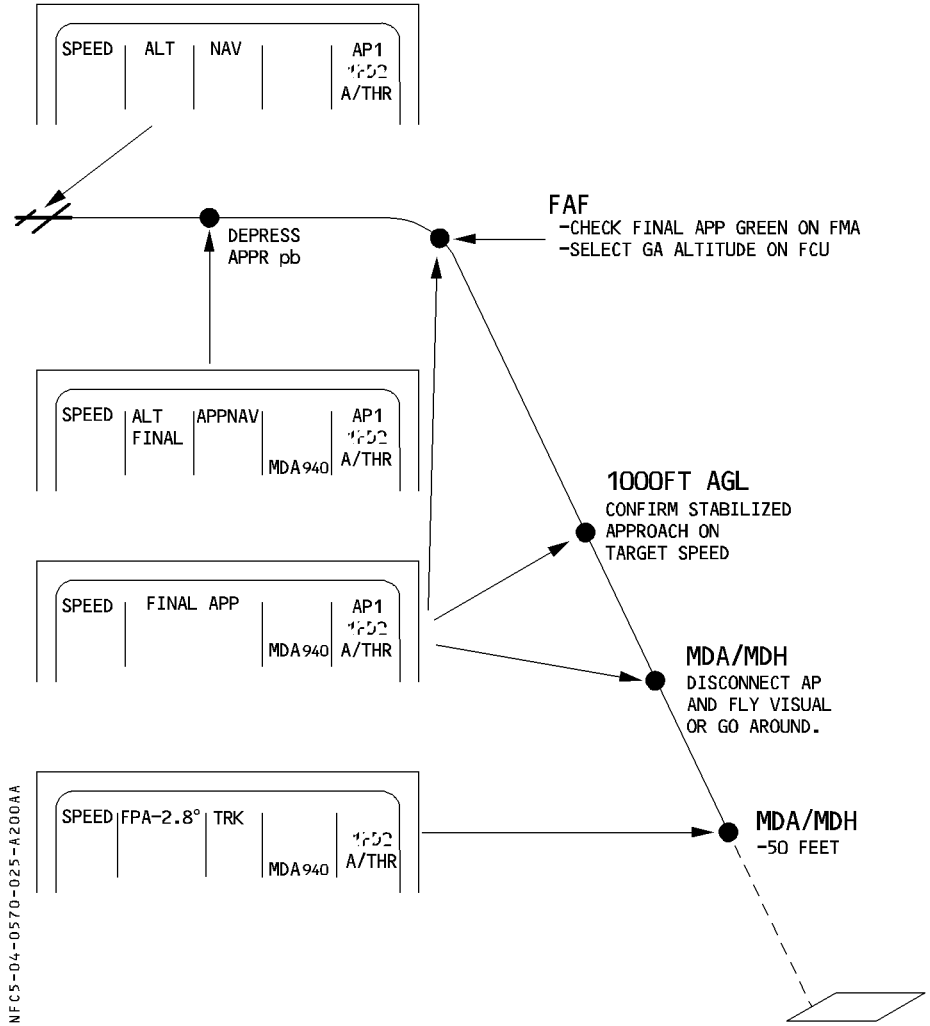
● **If visual references are acquired**

– DISCONNECT the autopilot and continue the approach visually.

● **If visual references are not acquired**

R **– INITIATE a go around**

NON PRECISION APPROACH PROFILE - LATERAL AND VERTICAL MANAGED GUIDANCE



CAUTION

R When FINAL APP NAV modes are engaged, the AP/FD will disengage at MDA/MDH - 50 ft (if entered) or 400 feet AGL if no MDA/MDH entered.
The FDs will revert to basic modes (HDG-V/S or TRK-FPA).

SELECTED NON PRECISION APPROACH

The non precision approach is flown in selected modes (TRK-FPA or HDG-V/S) when :
* the approach is not stored in the database or
* GPS PRIMARY is lost and the nav accuracy check is negative.

INTERMEDIATE APPROACH

Procedure

– USE TRK-FPA mode

– SELECT ND in the ROSE VOR mode

– KEEP the autothrust active

– USE managed speed

FINAL APPROACH

Upon reaching the final approach fix

– SELECT a final approach track on the FCU

– SELECT an FPA (flight path angle) to the final descent path angle
Anticipate the selection of FPA to smooth the interception of the final path.

Note : If the pilot is using the AP, select the final FPA approximately 0.3 NM before the final approach fix.

– SELECT a go around altitude on FCU.

– USE raw data to monitor aircraft position and flight path.

– AT MDA/MDH

● **If visual references are acquired**

– DISCONNECT the autopilot and continue the approach visually.

● **If visual references are not acquired**

R **– INITIATE a go around**

NON DIRECTIONAL BEACON (NDB) APPROACH TYPE

When the flight plan calls for an NDB approach, the system automatically tunes the ADF, only when the aircraft is passing the first fix of the approach. Therefore, it is convenient to manually tune the ADF earlier (before activating the approach phase).
Fly a Non Directional Beacon (NDB) approach as any non precision approach.

LOC APPROACH TYPE

– SELECT the LOC pushbutton in intermediate approach, to arm the LOC mode.

R

CAUTION

Do not select the APPR pushbutton.

– SELECT the ND in ROSE ILS mode.

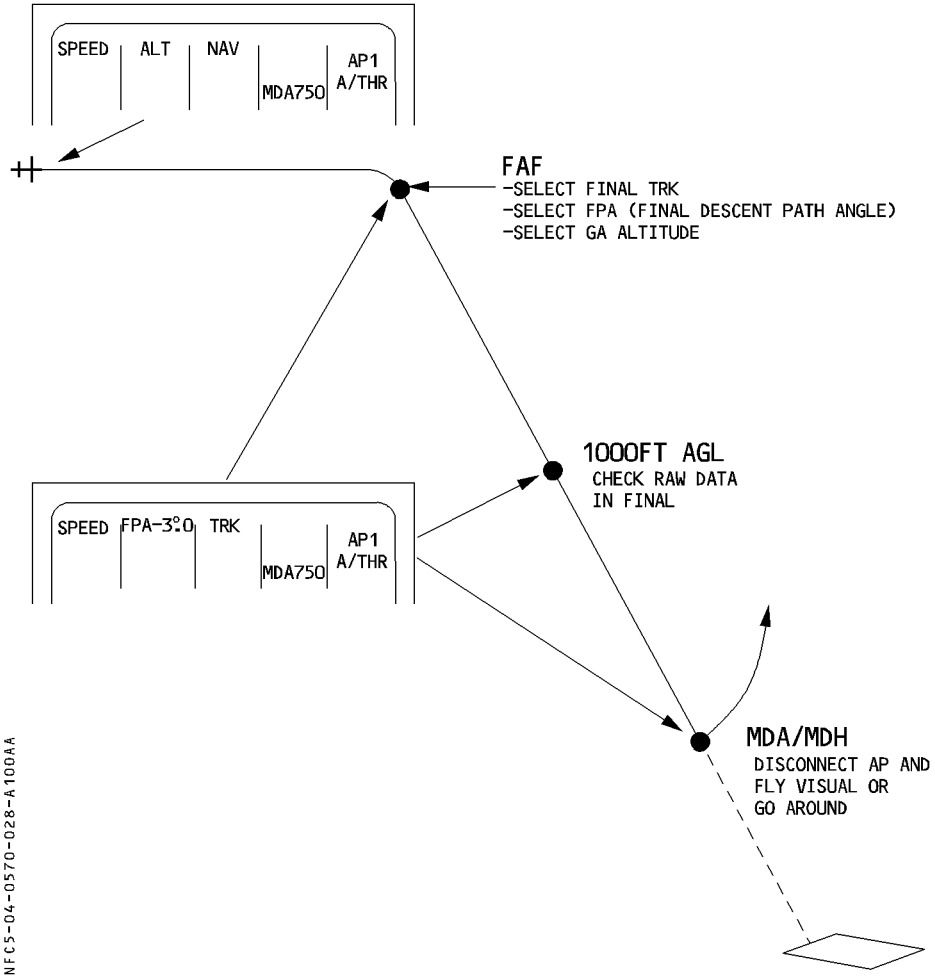
- **Upon reaching the final approach fix :**

  – MONITOR LOC engagement.

  – SELECT the FPA to the final descent path angle.

R *Note : In case of a dual Radio Altimeter (RA) failure, the LOC pushbutton can still be used*
R *to arm the LOC mode, as it does not depend on the RA signal.*

R **NON PRECISION APPROACH PROFILE - SELECTED GUIDANCE**



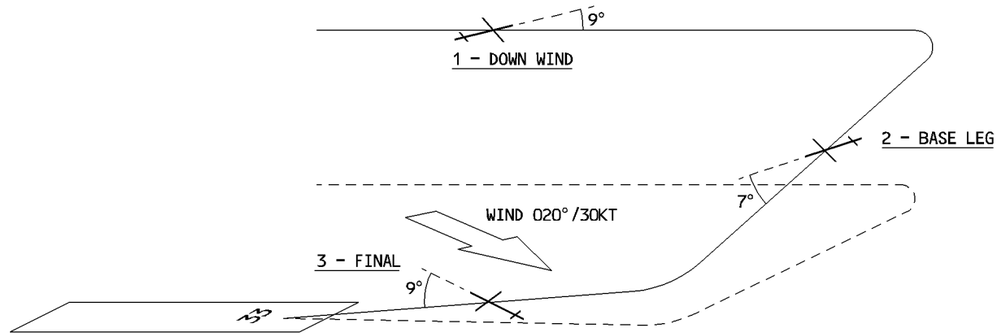
R *Note : If the distance to the runway is not properly assessed, a step descent approach*
R *may be considered and a level-off at MDA may be performed while searching for*
R *visual references. If the pilot has no visual reference at the MAP, at the latest, he*
R *must initiate a go-around.*

CIRCLING APPROACH

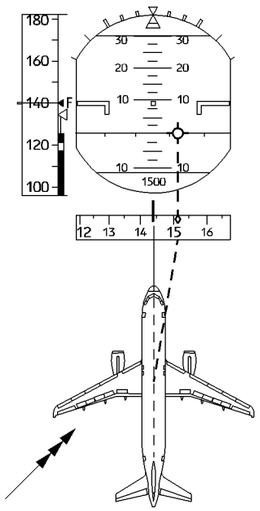
If the pilot chooses not to follow the SOP procedure, select both FDs OFF and fly visually.
If the runway in use is not the flight plan runway, the ground speed and the VAPP will not be computed properly, and the speed on final may be higher than excepted.
Therefore, select the approach speed directly on the FCU.

VISUAL APPROACH

When flying visual, the pilot may select an appropriate STAR and RWY in use on the MCDU.
The ND displays the extended runway centerline five nautical miles out from the runway. This helps the pilot during the final turn.
Along with the FPV, the PFD displays a track bug that may help the pilot to fly the downwind leg and intercept final. The FPV should be flown laterally with reference to the track bug.



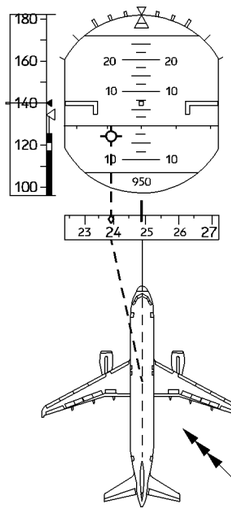
1 - DOWN WIND



020°/30KT

FPV ALIGNED ON THE HORIZON
FOR LEVEL FLIGHT
9° RIGHT DRIFT DUE TO CROSS
WIND FPV IN LINE WITH THE
TRACK BUG SELECTED ON THE
FCU

2 - BASE LEG

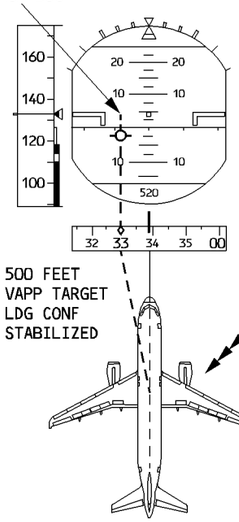


020°/30KT

SELECT RWY TRK
WITH FCU SELECTOR
MAINTAIN A CONSTANT
SLOPE.
FLAPS 3-F SPEED

TRACK BUG

3 - FINAL



500 FEET
VAPP TARGET
LDG CONF
STABILIZED

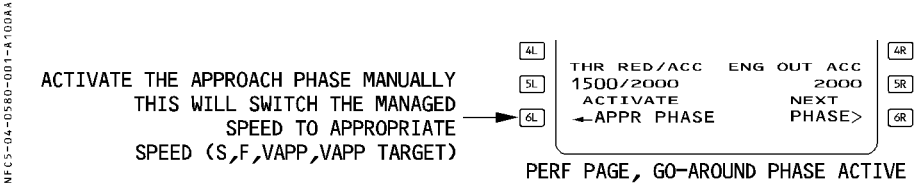
020°/30KT

2°5 GLIDE SLOPE
9° LEFT DRIFT
FPV AND BUG ALIGNED
RWY AXIS MAINTAINED

NFCS-04-0570-030-A001AA

MONITORING THE GO-AROUND

Engage the GO-AROUND phase and GO-AROUND modes by setting the thrust levers to the TOGA position, if at least CONF1 is selected.
When the GO-AROUND phase is engaged, the previously-flown approach is automatically strung back into the flight plan at the end of the missed approach procedure.
In the GO-AROUND phase, the system makes no predictions. Consequently, CLB and DES modes are not available, and the flight crew must monitor constraints.
When the aircraft leaves the GO-AROUND phase, all predictions and modes become available again. During a GO-AROUND phase, the managed speed is Green Dot.



HEADING/TRACK PRESET FUNCTION IN GO-AROUND PHASE

The flight crew can use the heading/track preset, when LOC*, LOC, LAND, FINAL or GA is engaged.

- **SET the appropriate heading, or track value, in the window of the FCU.**
- **When necessary, PULL the HDG/TRK selection knob to engage the mode on the preset value.**

R **GO-AROUND FROM AN INTERMEDIATE APPROACH ALTITUDE**

R To interrupt the approach, or to perform a GO-AROUND, from an intermediate altitude in the
R approach, and if TOGA thrust is not required, proceed as follows :

R — **SET the thrust levers to TOGA detent, then retard the thrust levers as required.**
R This enables the engagement of the GO-AROUND phase, with associated AP/FD modes.

R — **SELECT the applicable AP/FD and A/THR modes on the FCU.**

R *Note : If the thrust levers are not set briefly to TOGA detent, the FMS does not engage*
R *the GO-AROUND phase, and flying over, or close to the airport (less than 7 NM)*
R *will sequence the Destination waypoint in the F-PLN.*

R GO-AROUND FROM AN INTERMEDIATE APPROACH ALTITUDE

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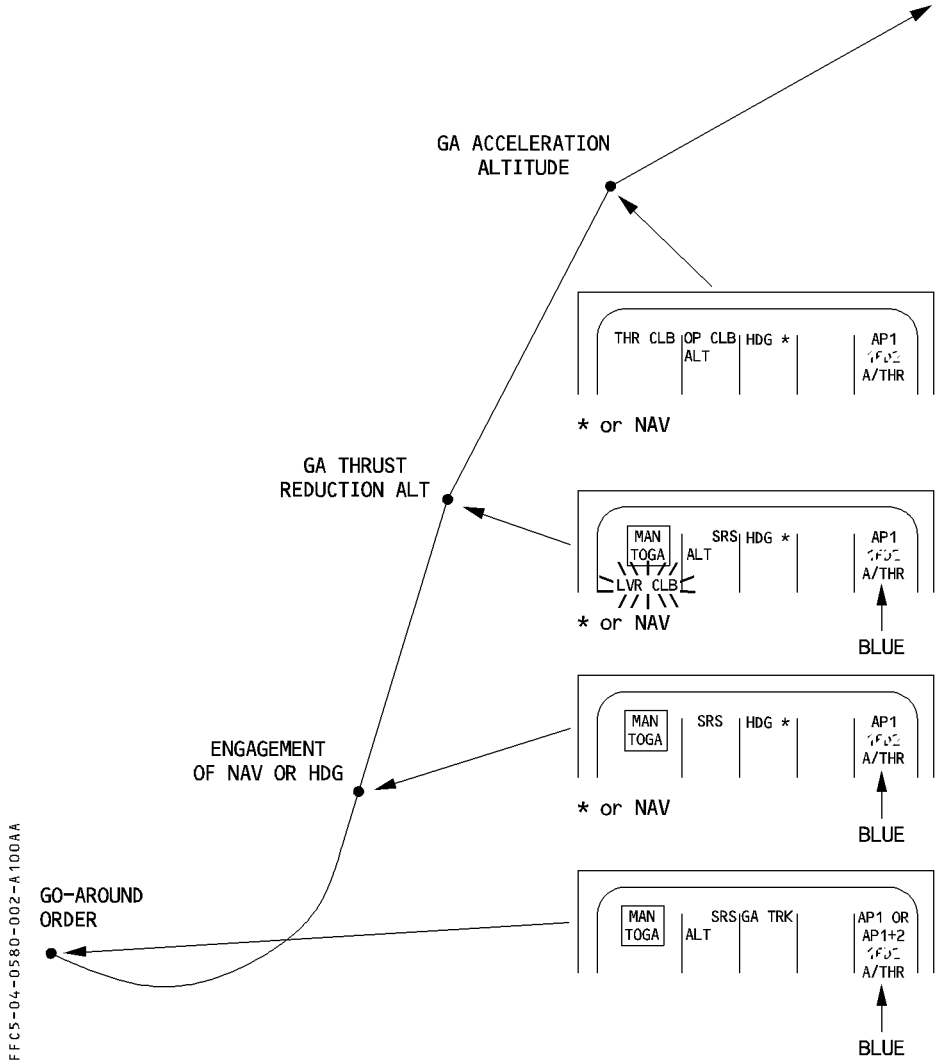
R — **SELECT the applicable AP/FD and A/THR modes on the FCU.**

R *Note : If the thrust levers are not set briefly to TOGA detent, the FMS does not engage*
R *the GO-AROUND phase, and flying over, or close to the airport (less than 5 NM)*
R *will sequence the Destination waypoint in the F-PLN.*

GO-AROUND PROFILE

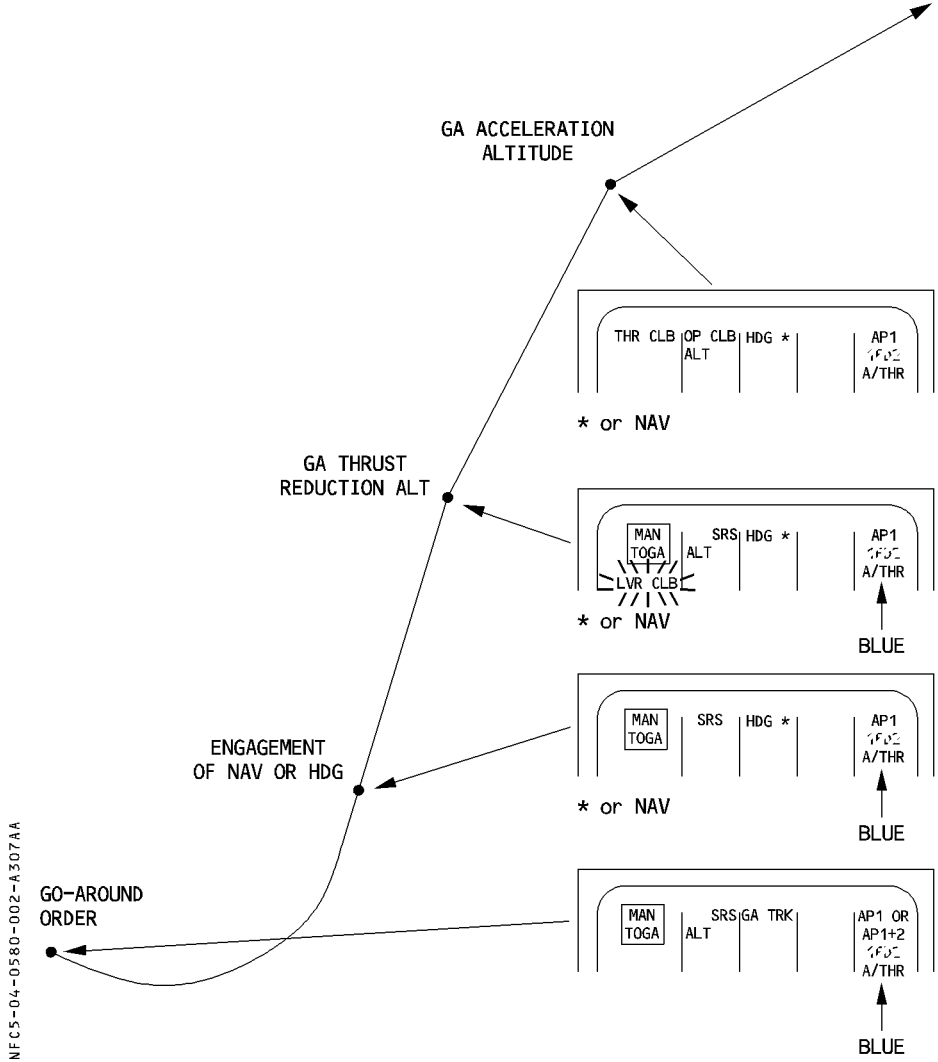
- **WITH FD ON**

  – **Apply SOP procedures**



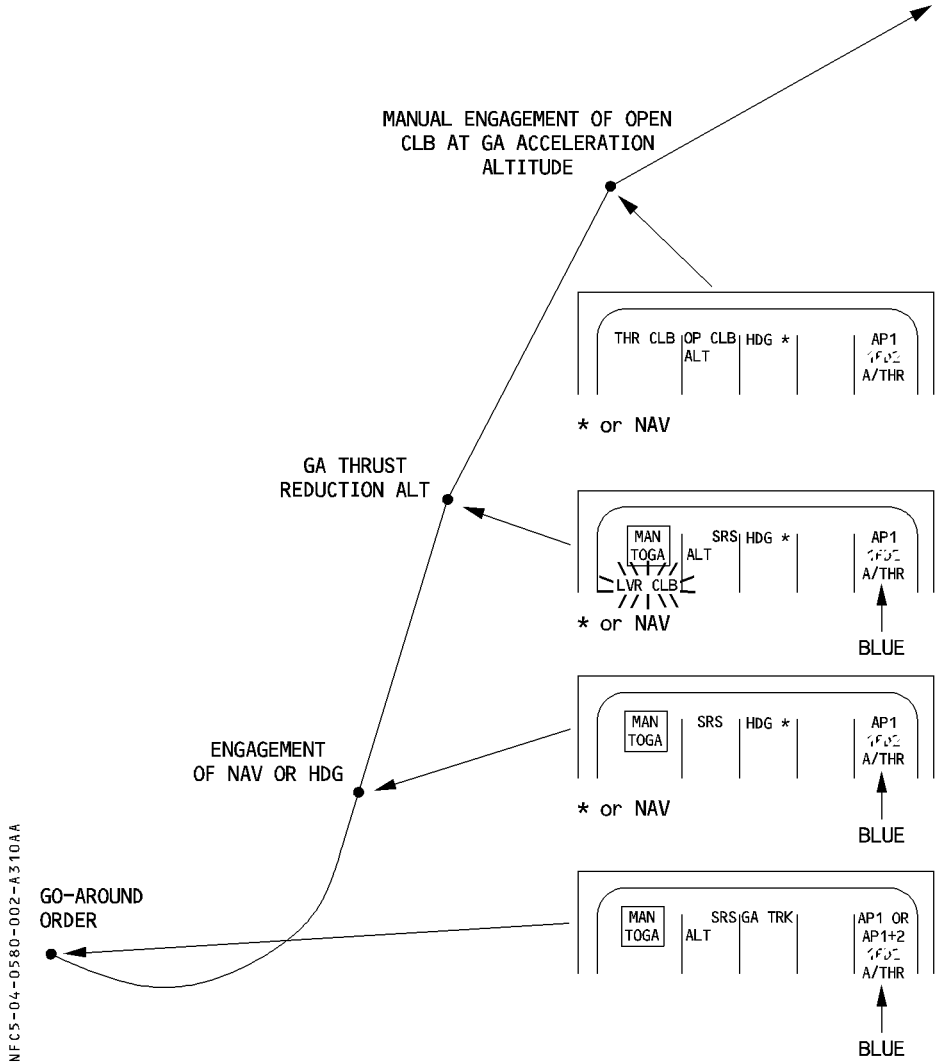
GO-AROUND PROFILE

– Apply SOP procedures

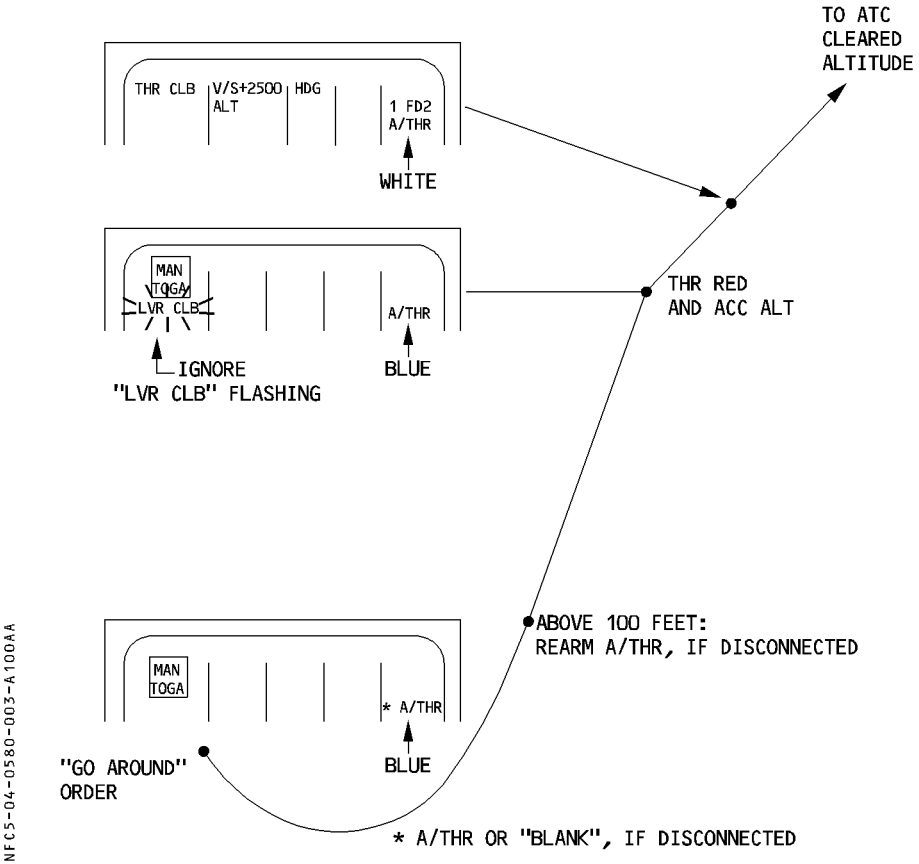


GO-AROUND PROFILE

– Apply SOP procedures



- **WITHOUT FD**



– **APPLY SOP procedures**

If the FDs are OFF and the GO AROUND is started above 100 feet, A/THR will remain armed when the flight crew moves the thrust levers to TOGA. If it is started below 100 feet, A/THR will disconnect and will have to be rearmed manually (above 100 feet).

If the flight crew moves the thrust levers to the CL detent at thrust reduction altitude, with the FDs OFF and A/THR armed, SPEED mode engages on the target speed indicated on the FCU.

This causes a thrust reduction, whenever the current speed is above the target speed.

CAUTION

When the pilot reengages both FDs simultaneously, the FD vertical mode may not be available (no pitch bar, no pitch mode on FMA, dashes (or blank) on the A/THR column).

· Using the V/S - FPA knob on the FCU to SELECT V/S mode will restore normal FD modes.
Refer to 1.22.30 FD engagement for details.

MISSED APPROACH : TRY AGAIN

If the pilot intends to fly another approach to the destination :
– The flight plan has all the necessary data for the missed approach.
– Green Dot is the target speed.

- **When cleared by the ATC to follow the missed approach procedure :**

  – ENGAGE NAV mode, or

  – TURN and PULL the HDG selector knob to set a heading.
  HDG, or TRK, or NAV modes can only be engaged above 100 feet.

- **When entering the initial approach area :**

  – Activate the approach phase on the MCDU's PERF GO AROUND page.

  - **If the APPR phase is not activated :**
    – Managed approach speed will not be available.
    – The system will not furnish predictions.
    – MDA/MDH/DH displays will not appear on the PFD.

MISSED APPROACH : DIVERT

- **If the crew decides to divert to the alternate :**

  – ENABLE ALTN, preferably at the TO waypoint.

- **When cleared to a waypoint :**

  – PERFORM a DIRECT TO.

The system automatically reverts to CLB phase, and modifies the target speed from Green Dot to initial speed.
The system automatically sets the CRZ FL to the defaulted alternate CRZ FL (FL 220 or 310), and retains the previous cost index.
The pilot may adjust these as necessary.

Note : Diversion may also be initiated by entering a NEW DEST in the LAT REV page at the TO waypoint, or by using the secondary F-PLN, if prepared. Refer to 4.04.30.

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MISSED APPROACH : TRY AGAIN

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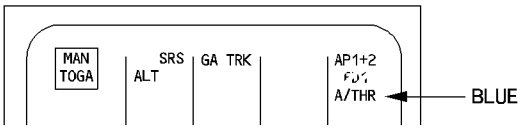
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R

TASKSHARING DURING A GO-AROUND

PF	PNF
-Announce "GO AROUND, FLAPS". Simultaneously set thrust levers to TO GA.	Retract flaps one step, and monitor engine parameters.
-Monitor the flight path.	



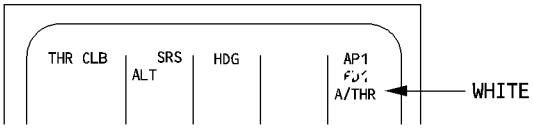
When rate of climb is positive:

-Announce "GEAR UP"	-Announce "POSITIVE CLIMB" -Retract the gear and confirm "GEAR UP"

When LVR CLB flashes on FMA:

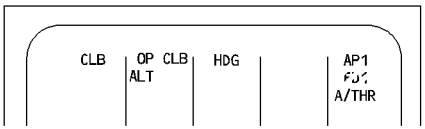
-Set thrust levers to CL detent

-Push or Turn/pull HDG/TRK sel knob on FCU according to ATC clearance



At go-around acceleration altitude:

-Monitor that the target speed increases to Green Dot.



A call out must be done by the PNF as follows:

"BANK": if bank angle becomes greater than 7°
"PITCH": if pitch attitude becomes greater than 20° or less than 10° up
"SINK RATE": if there is no climb rate

● If the speed target does not increase to Green Dot:
-CHECK and PULL the altitude selector knob to engage OP CLB
The speed target increases to Green Dot
-Retract flaps on schedule.

NFC5-04-0580-005-A100AA

06.00 CONTENTS

06.10 DEGRADED MODES OF OPERATION

– INDEPENDENT MODE 1
– SINGLE MODE 2

06.20 ABNORMAL PROCEDURES

– AUTOMATIC FMGS RESET AND RESYNCHRONIZATION 1
R – DUAL LATCH 4
R – MANUAL RESET OF FMGCs 5
– ERRONEOUS PREDICTIONS 5
– SPURIOUS ENGINE OUT INDICATION 6
– CAT3 DUAL INOPERATIVE 6
– FM/GPS POS DISAGREE MESSAGE ◁ 6
– CHECK GW MESSAGE 7
– AUTO FLT A/THR OFF MESSAGE 7
– MCDU LOCKED OR BLANK 8
R – ERRONEOUS AIRCRAFT POSITION AFTER LANDING
R IN LOC MODE 8

06.30 CROSSLOAD OF NAV DATA BASE ◁

06.40 FMGC RESPONSE TO FAILURE CASES.

06.00 CONTENTS

06.10 DEGRADED MODES OF OPERATION
– INDEPENDENT MODE 1
– SINGLE MODE 2

06.20 ABNORMAL PROCEDURES
– AUTOMATIC FMGS RESET AND RESYNCHRONIZATION 1
– MANUAL RESET OF FMGCS 5
– ERRONEOUS PREDICTIONS 5
– CAT3 DUAL INOPERATIVE 6
– FM/GPS POS DISAGREE MESSAGE 6
– CHECK GW MESSAGE 7
– AUTO FLT A/THR OFF MESSAGE 7
– MCDU LOCKED OR BLANK 8

06.30 CROSSLOAD OF NAV DATA BASE

06.40 FMGC RESPONSE TO FAILURE CASES.

06.00 CONTENTS

06.10 DEGRADED MODES OF OPERATION

– INDEPENDENT MODE 1
– SINGLE MODE 2

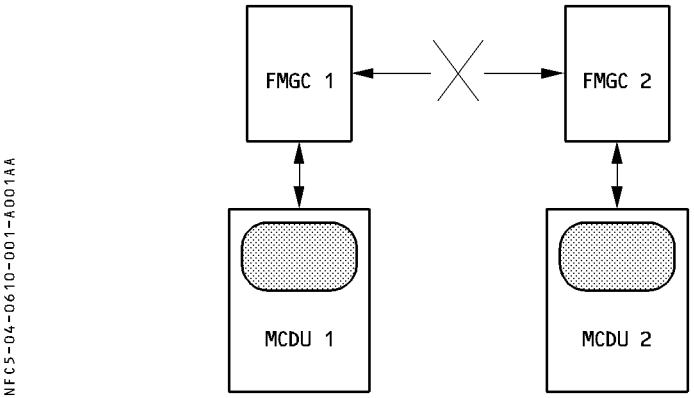
06.20 ABNORMAL PROCEDURES

– AUTOMATIC FMGS RESET AND RESYNCHRONIZATION 1
– FMS DEGRADED MODE 3
R – DUAL LATCH 4
R – MANUAL RESET OF FMGCs 5
– ERRONEOUS PREDICTIONS 5
– CAT3 DUAL INOPERATIVE 6
– FM/GPS POS DISAGREE MESSAGE 6
– CHECK GW MESSAGE 7
– AUTO FLT A/THR OFF MESSAGE 7
– MCDU LOCKED OR BLANK 8

06.30 CROSSLOAD OF NAV DATA BASE

06.40 FMGC RESPONSE TO FAILURE CASES.

INDEPENDENT MODE



The system automatically selects this degraded mode under specific abnormal conditions. (e. g. different database validity on both FMGCs).
While this occurs, the "INDEPENDENT OPERATION" message is displayed on both MCDU scratchpads.

R On the POS MONITOR page (and GPS MONITOR page ◁), FMGS position (and GPS position
R ◁) from the opposite FMGC is not displayed.
On the RAD NAV page (and PROG page, if the FMGS GPS is not installed), navaids tuned on the opposite MCDU are not displayed. Corresponding fields are blank.

Procedures on ground

If each FMGC is loaded with a different database, the FMGS will only operate in independent mode.

- **CHECK the database number and validity.**

- **CROSSLOAD ◁ the database to restore the dual operation.**
  Crossload function is an optional function, operative in the preflight or done phase, when an independent operation is detected.

Procedures in flight

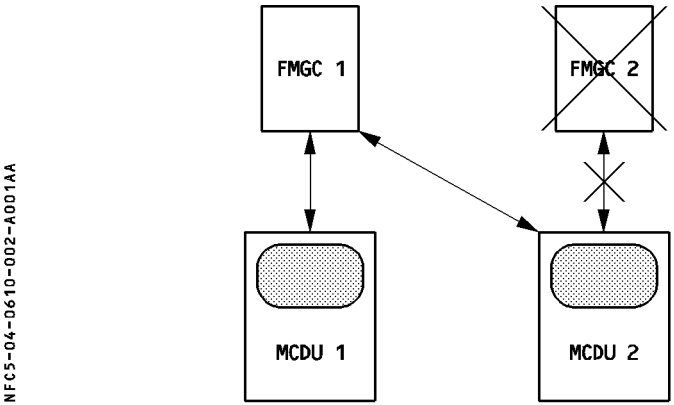
- **Do not switch the navigation databases.**

- **Make the same entries on both MCDUs to have both AP/FDs similar orders.**
  – Both FGs being valid, 2 APs may be engaged for CAT II or CAT III operations.

R ● **In the event of a go-around and when the second AP is disconnected :**

R **– ENSURE that the FMGC in command has correct flight plan orders and an**
R **updated nav database.**
R – Airbus does not recommend pulling one FMGC circuit breaker to force the system
R to operate in SINGLE mode.

SINGLE MODE



The system automatically selects this degraded mode when one FMGC fails.
While this occurs, the failed FMGC displays "OPP FMGC IN PROCESS" on the MCDU scratchpad. The corresponding ND displays the "SELECT OFFSIDE RNG/MODE" amber message.
Both POS MONITOR pages display the same position (operative FMGC position).
Both FDs are driven by the same FMGC.
Any entry on either MCDU is sent to the operative FMGC.

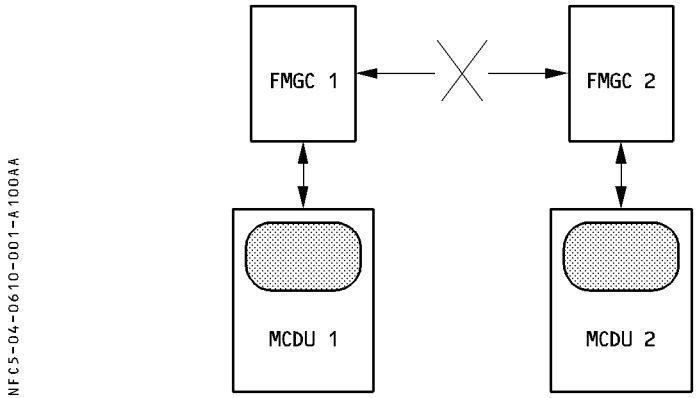
Procedures

● **If a transient failure triggers a single mode of operation :**
DO NOT USE the MCDU(s) until the PLEASE WAIT message is suppressed.

– Set both NDs on the same range and mode to display the same information from the operative FMGC.

– When convenient, you will reset the failed FMGC using the procedure described in this chapter.

INDEPENDENT MODE



The system automatically selects this degraded mode under specific abnormal conditions. (e. g. different database validity on both FMGCs).
While this occurs, the "INDEPENDENT OPERATION" message is displayed on both MCDU scratchpads. "IND" annunciator on top of the MCDU is lit.
On the POS MONITOR page (and GPS MONITOR page ◁), FMGS position (and GPS position ◁) from the opposite FMGC is not displayed.
On the RAD NAV page, navaids tuned on the opposite MCDU are not displayed. Corresponding fields are blank.

Procedures on ground :

If each FMGC is loaded with a different database, the FMGS will only operate in independent mode.

- **CHECK the database number and validity.**

- **CROSSLOAD the database to restore the dual operation.**
  Crossload function is operative in the preflight or done phase, when an independent operation is detected.

Procedures in flight :

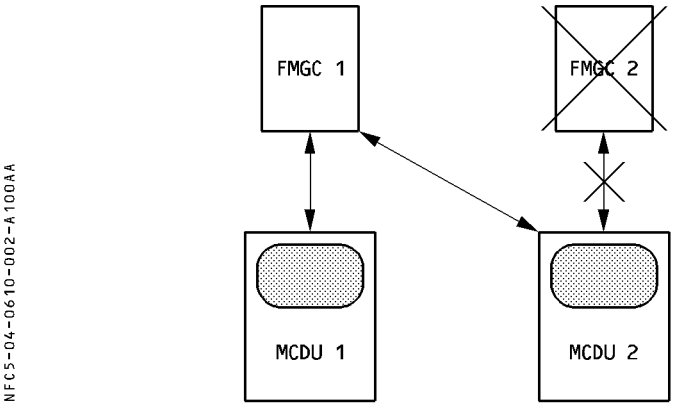
- **Do not switch the navigation databases.**

- **Make the same entries on both MCDUs to have both AP/FDs similar orders.**
  – Both FGs being valid, 2 APs may be engaged for CAT II or CAT III operations.

- **In the event of a go-around, and when the second AP is disconnected :**

  – **ENSURE that the FMGC in command has correct flight plan orders and an updated nav database.**
    – Airbus does not recommend pulling one FMGC circuit breaker to force the system to operate in SINGLE mode.

SINGLE MODE



The system automatically selects this degraded mode, when one FMGC fails.
While this occurs, the MCDU on the side of the failed FMGC reverts to MCDU MENU page, and a prompt to connect the MCDU on the opposite FMGC is displayed. When this prompt is pressed, the "OPP FMGC IN PROCESS" message is displayed in the scratchpad. The corresponding ND displays the "SELECT OFFSIDE RNG/MODE" amber message.
Both POS MONITOR pages display the same position (operative FMGC position).
Both FDs are driven by the same FMGC.
Any entry on either MCDU is sent to the operative FMGC.

Procedures

- **If a transient failure triggers a single mode of operation :**

  – **Set both NDs on the same range and mode to display the same information from the operative FMGC.**

  – **When convenient, you will reset the failed FMGC using the procedure described in this chapter.**

AUTOMATIC FMGS RESET AND RESYNCHRONIZATION

FM RESET

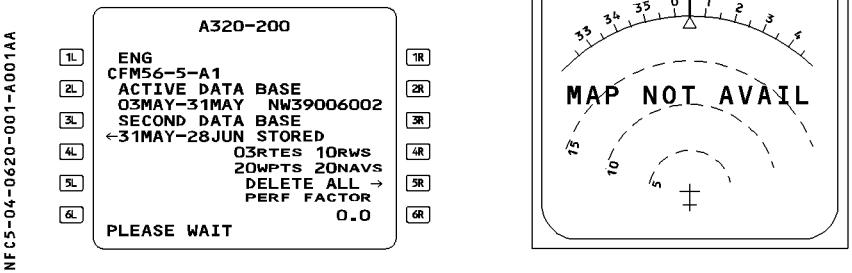
When the FM software cannot work properly or receives instructions to perform impossible operations, it automatically resets itself. A resynchronization with the other FM always follows.
When the reset is a minor one, the system will recover by itself. One single reset lasts 2 to 3 seconds maximum followed by 25 seconds of resynchronization.
When the reset is a major one :
- Resets recur at short intervals (several in two or three minutes).
- The memories are cleared, leading to the loss of F-PLN, GW, CI, CRZ FL, MCDU-entered speeds and navaids and to database switching.

FM RESYNCHRONIZATION

An FM resynchronization automatically occurs after an FM reset but it may occur independently each time self comparisons between FM1 and FM2 reveal discrepancies.
One single resynchronization lasts approximately 25 seconds.
If 5 several resynchronizations occur within 5 minutes, independent mode commences.

FMGC STATUS DURING A RESET/RESYNCH

While a RESET/RESYNCH occurs :
- The ND shows "MAP NOT AVAIL".
- The MCDU reverts to the A/C STATUS page, with "PLEASE WAIT" displayed in the scratchpad.
- Autotuning of Navaids (VOR, DME, ADF) are lost on the failed side.
- AP and managed modes may be transiently lost (reversion to HDG/V/S or TRK/FPA).
- If the pilot presses a key while the scratchpad is showing "PLEASE WAIT", there is no change at MCDU level. This is normal, and the crew should no respond by pulling the MCDU circuit breaker.



SINGLE RESET or DUAL RESET WITH AUTORECOVERY

If the RESET/RESYNCH succeeds, all functions are recovered.

R *Note : When a FMGC is recovered, its FD if previously engaged, is also recovered and its*
R *status is displayed on the FMA.*

Procedure

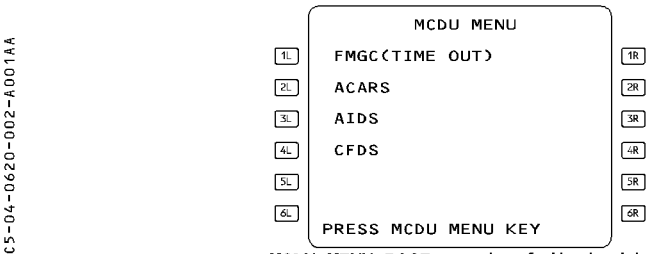
— **RESELECT the convenient MCDU page.**

— **REENGAGE managed modes and the AP.**
WAIT one minute after the "PLEASE-WAIT" message has disappeared, before engaging the AP/FD of the failed FMGC.

R — **If "MAP NOT AVAIL" remains displayed, along with "SET OFFSIDE RNG/MODE"**
R **on one ND, temporarily SELECT a different mode on the corresponding EIS**
R **control panel.**

SINGLE LATCH

If five successive resets occur, the failing FMGC will latch, and single mode operation commences.
While failed, the following occurs :
— The failed ND side displays "MAP NOT AVAIL" and "SELECT OFFSIDE RNG/MODE" (if the NDs are not both in the same mode or range).
— The MCDU reverts to the MENU PAGE and shows an "FMGC TIME OUT" prompt.
— If the AP and FD were previously engaged on the failed side, the AP and FD disengage and the right-hand column of the FMA shows that the operating FD is offside. The ECAM displays the "AP OFF" warning, and the master warning light and audio remind the pilot of the AP disengagement.
— All functions are restored on the operative side.



MCDU MENU PAGE on the failed side

Procedure

— **Select the same range and mode on both NDs to give the failed ND side something to display.**

AUTOMATIC FMGS RESET AND RESYNCHRONIZATION

FM RESET

When the FM software cannot work properly, or receives instructions to perform impossible operations, it automatically resets itself. A resynchronization with the other FM always follows.
When the reset is a minor one, the system will recover by itself. One single reset lasts a maximum of 2 to 3 seconds, followed by a resynchronization.
When the reset is a major one :

- Resets recur at short intervals (several in one minute).
- The memories are cleared, leading to the loss of F-PLN, GW, CI, CRZ FL, MCDU-entered speeds and navaids.

Note : If four dual FM resets occur in three minutes, pilot-entered data is lost. If a dual reset is identified, it is recommended that the flight crew does not perform again the last MCDU actions for one minute (in order to avoid a potential second dual reset, leading to the loss of pilot-entered data).

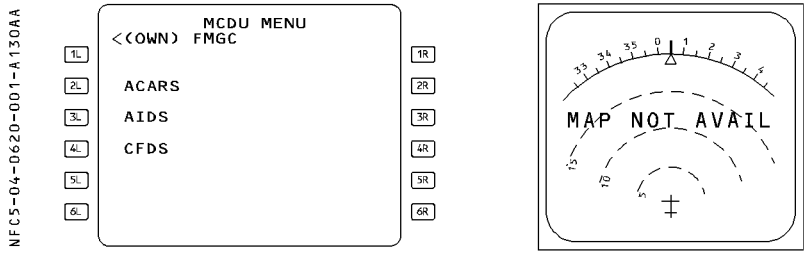
FM RESYNCHRONIZATION

An FM resynchronization automatically occurs after an FM reset. But, it may occur independently each time self-comparisons between the FM1 and FM2 reveal discrepancies.
If three successive resynchronizations fail, independent mode commences.

FMGC STATUS DURING A RESET/RESYNCH

While a RESET/RESYNCH occurs :

- The ND shows "MAP NOT AVAIL".
- The MCDU may revert to the MCDU MENU page.
- Autotuning of Navaids (VOR, DME, ADF) are lost on the failed side.
- AP/FD/ATHR modes may be transiently lost.
- A reversion to basic modes (HDG/V/S or TRK/FPA) occurs if the FM1 (FM2) resets while AP1 (AP2) is engaged.



SINGLE RESET or DUAL RESET WITH AUTORECOVERY

If the RESET/RESYNCH succeeds, all functions are recovered.

Note : When an FMGC is recovered, its FD (if previously engaged), is also recovered and its status is displayed on the FMA.

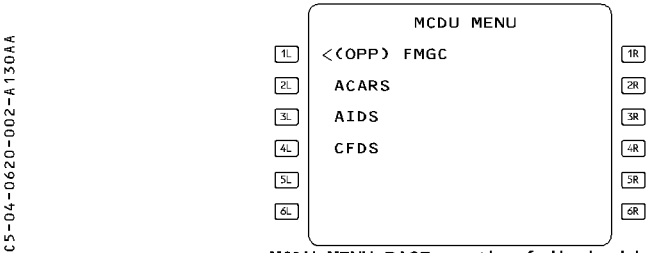
Procedure

- **RESELECT the convenient MCDU page.**
- **REENGAGE managed modes, and the AP and A/THR, if necessary.**
- **If "MAP NOT AVAIL" remains displayed, along with "SET OFFSIDE RNG/MODE" on one ND, temporarily SELECT a different mode on the corresponding EIS control panel.**

SINGLE LATCH

If five successive resets occur in four minutes, the failing FMGC will latch, and single mode operation will start.
While failed, the following occurs :

- The failed ND side displays "MAP NOT AVAIL" and "SELECT OFFSIDE RNG/MODE" (if the NDs are not both in the same mode or range).
- The MCDU reverts to the MENU PAGE and shows an "(OPP) FMGC" prompt.
- If the AP and FD were previously engaged on the failed side, the AP and FD disengage and the right-hand column of the FMA shows that the operating FD is offside. The ECAM displays the "AP OFF" warning, and the master warning light and audio remind the pilot of the AP disengagement.
- All functions are restored on the operative side.



MCDU MENU PAGE on the failed side

NF05-04-0620-002-A130AA

Procedure

- **Select the same range and mode on both NDs to give the failed ND side something to display.**

– **Select any function key on the affected FMGC MCDU. (The page will display "OPP FMGC IN PROGRESS").**
Both MCDUs are now driven by the other FMGC, and only one AP/FD is available. The system works in SINGLE Mode.

– **Perform a manual reset of the failed FMGC, when convenient.**

DUAL RESET WITH LOSS OF DATA AND AUTORECOVERY

Three successive dual resets without result erases all pilot-entered data (F-PLN, GW, CRZ FL, CI...).
When FMGS recovery is obtained :
– Database cycle may have switched.
– The FM position bias is lost. The FM position returns to the MIX IRS position.
– Autotuning the VOR/DME is restored, based on the aircraft's IRS position.
– FMGS tuning of the ILS and ADF is not possible.
– Lateral and vertical managed mode cannot reengage.
– The "CAB PR LDG ELEV FAULT" ECAM message is displayed.
– A map display may be lost on one ND.

Procedure

When the system has recovered :

– **SELECT the initial database.**

– **SELECT DIR TO the required downpath waypoint.**

– **SELECT LAT REV at the downpath waypoint, and redefine the DESTINATION.**

– **SELECT the FUEL PRED page, and enter GW.**

– **SELECT the PROG page, and enter CRZ FL.**

– **SELECT the PERF page, and enter CI.**

– **CHECK or reengage (as appropriate) the relevant speed/Mach target and vertical mode.**
Redefine the flight plan for the remainder of the flight, as the opportunity presents itself.

– **Select any function key on the affected FMGC MCDU. (The page will come up displaying "OPP FMGC IN PROGRESS").**
Both MCDUs are now driven by the other FMGC, and only one AP/FD is available. The system works in SINGLE Mode.

– **Perform a manual reset of the failed FMGC, when convenient.**

DUAL RESET WITH LOSS OF DATA AND AUTORECOVERY

Four successive dual resets in three minutes erases all pilot-entered data (F-PLN, GW, CRZ FL, CI...).
When FMGS recovery is obtained :
– The FM position bias is lost. The FM position returns to the MIX IRS position.
– Autotuning the VOR/DME is restored, based on the aircraft's IRS position.
– FMGS tuning of the ILS and ADF is not possible.
– Lateral and vertical managed mode cannot reengage.
– The "CAB PR LDG ELEV FAULT" ECAM message is displayed.
– A map display may be lost on one ND.

Procedure

When the system has recovered :

– **SELECT DIR TO the required downpath waypoint.**

– **SELECT LAT REV at the downpath waypoint and redefine the DESTINATION.**

– **SELECT the FUEL PRED page and ENTER the ZFW and ZFWCG values (or the GW and CG).**

– **SELECT the PROG page and enter CRZ FL.**

– **SELECT the PERF page and enter CI.**

– **CHECK or reengage (as appropriate) the relevant speed/Mach target and vertical mode.**
Redefine the flight plan for the remainder of the flight, as the opportunity to do so presents itself.

– **If "MAP NOT AVAIL" remains displayed, along with "SET OFFSIDE RNG/MODE" on one ND, temporarily SELECT a different mode on the corresponding EIS control panel.**

– **PERFORM a NAV accuracy check, when possible.**
A manual FM position update should be considered, if MIX IRS and actual positions differ by more than 20 NM.

– **If "MAP NOT AVAIL" remains displayed, along with "SET OFFSIDE RNG/MODE" on one ND, temporarily SELECT a different mode on the corresponding EIS control panel.**

– **PERFORM a NAV accuracy check, when possible.**
A manual FM position update should be considered, if MIX IRS and actual positions differ by more than 20 NM.

FMS DEGRADED MODE

In some remote cases (several automatic resets in a row on one or both FMS), the affected FMS(s) may enter a "degraded mode", with no predictions.
The intent of this degraded mode is to keep maximum use of the FMS and related functions.
The characteristics of this FMS degraded mode are the following :
– The predictions are lost on the affected FMS(s). All predictions are replaced by dashes on MCDU pages.
– The vertical profile and managed speed computations are lost on the affected FM(s) (in Approach phase, VAPP is correctly computed and managed speed is available).
– Managed vertical guidance and managed speed (if previously used) are lost and revert to selected mode.
– Lateral path computation and guidance remain available.
– The MCDU displays the "FM PREDICTIONS LOST" message.

Note : 1. If predictions are lost on one FMS only, all managed modes are available when using the other side AP.
2. The Approach phase must be activated manually.

Procedure

- **If the message "FM PREDICTIONS LOST" is displayed :**
  – If vertical managed guidance and/or prediction are not deemed necessary, keep using the FMS as needed for Lateral navigation only. Use selected modes for vertical and speed guidance.

    Note : If only one FMS has entered the degraded mode, consider using the other AP.

  – If vertical managed guidance and/or predictions are required, RE-ENTER a Cost Index (CI) value on INIT A or PERF MCDU page (predictions for the active flight plan are then recomputed).
- **If the message "FM PREDICTIONS LOST" is displayed :**

  Note : In approach phase, a CI entry is not allowed : it is then not possible to recover predictions.

DUAL LATCH

- Both FMGCs are inoperative. FM and FG capability are lost.
- Both NDs display "MAP NOT AVAILABLE". Navaid tuning is not performed.
- AP/FD, A/THR are lost.
- FMGC (TIME OUT) subsystem page is displayed on both MCDUs.
- The following messages are displayed on the ECAM :
  "CAB PR LDG ELEV FAULT"
  "AUTO FLT AP OFF", if AP was engaged
  "AUTO FLT A/THR OFF", if A/THR was engaged.

Procedure

- **FLY raw data.**

- **TUNE necessary navaids using the RMPs.**

- **PERFORM a manual reset of both FMGCs.**

  Note : A recovery will result in the loss of all pilot-entered data.

Note for all FMGS automatic resets

- A single or double FM auto-reset does not affect an ILS approach below 700 feet AGL. ILS frequency is locked and AP/FDs remain engaged.
- Above 700 feet, the loss of ILS tuning due to a dual reset will cause a loss of LOC and G/S, and the disengagement of APs and FDs.
- During a non ILS approach, if the master FMGC fails, AP/FD and managed modes are lost and FDs engage in basic modes.

MANUAL RESET OF FMGCs

On rare occasions, the FMGC may require manual resetting.
If this occurs in flight, reset one FMGC at a time.

MANUALLY RESETTING ONE FMGC

- Before resetting FMGC 1 (or 2), SWITCH OFF FD 1 (or 2).
  After applying external power or APU generator power, wait two minutes before resetting the FMGC circuit breakers.
- Pull the CB of the affected FMGC and reset it after five seconds. The FMGC circuit breakers are :
  - AUTO FLT/FMGC 1 M16 ON 121 VU, or B2 ON 49 VU, with Mod 20748.
  - AUTO FLT/FMGC 2 M17 ON 121 VU

CAUTION

Always wait 1 minute after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.

MANUALLY RESETTING BOTH FMGCs

When the aircraft is on ground with the engines stopped, the flight crew may attempt a double and simultaneous CB reset when a single CB reset has failed.
Apply the above-mentioned procedure to both FMGCs.

ERRONEOUS PREDICTIONS

The FMGS may display temporary erroneous predictions that can affect such data as ECON speed/Mach, optimum flight level, fuel or time predictions.
If erroneous predictions are observed :

R **On ground, or in flight :**

- **Check the cruise temperature (sign and value), the gross weight, and the cruise flight level.**

R - **REENTER the same cost index to restart a computation (In descent or approach, a cost index change does not restart a compuration), or**

- **MAKE a COPY ACTIVE, then activate the secondary, or**

R - **MAKE a DIR TO the "TO" waypoint.**

SPURIOUS ENGINE-OUT INDICATION

R If a spurious engine-out is detected :

Procedure

- **PRESS the EO CLR prompt of the MCDU PERF page**
- **RE-ENGAGE previous vertical mode**
- **RE-ENTER preselected speeds (if any). No other consequences are to be expected.**

CAT 3 DUAL INOPERATIVE

If "CAT 3 DUAL" appears in the INOP SYS list, and no other failure is detected :

- **CHANGE the AP in command. This may recover the CAT 3 DUAL function.**

FM/GPS POS DISAGREE MESSAGE ◁

This ECAM message is triggered when either one of the FM positions differs from either of the GPS positions by more than 0.5 minutes of latitude or longitude.
This may occur when an update of the FM positions is performed automatically by the FM (Takeoff update or loc update in approach with unprecise airfield or navaid position within the database), or manually by the pilot (manual update). For procedure, refer to abnormal procedure 3.02.34 and QRH.

MANUAL RESET OF FMGCs

On rare occasions, the FMGC may require manual resetting.
If this occurs in flight, reset one FMGC at a time.

MANUALLY RESETTING ONE FMGC

- Before resetting FMGC 1 (or 2), SWITCH OFF FD 1 (or 2).
  After applying external power or APU generator power, wait two minutes before resetting the FMGC circuit breakers.
- Pull the CB of the affected FMGC and reset it after five seconds. The FMGC circuit breakers are :
  - AUTO FLT/FMGC 1 M16 ON 121 VU, or B2 ON 49 VU, with Mod 20748.
  - AUTO FLT/FMGC 2 M17 ON 121 VU

CAUTION

Always wait 1 minute after the "PLEASE WAIT" message disappears from the MCDU, before engaging or reengaging the FDs and the AP of the reset FMGC.

MANUALLY RESETTING BOTH FMGCs

When the aircraft is on ground with the engines stopped, the flight crew may attempt a double and simultaneous CB reset when a single CB reset has failed.
Apply the above-mentioned procedure to both FMGCs.

ERRONEOUS PREDICTIONS

The FMGS may display temporary erroneous predictions that can affect such data as ECON speed/Mach, optimum flight level, fuel or time predictions.
If erroneous predictions are observed :

R **On ground, or in flight :**

- **Check the cruise temperature (sign and value), the gross weight, and the cruise flight level.**

R - **REENTER the same cost index to restart a computation (In descent or approach, a cost index change does not restart a compuration), or**

- **MAKE a COPY ACTIVE, then activate the secondary, or**

R - **MAKE a DIR TO the "TO" waypoint.**

R **SPURIOUS ENGINE-OUT INDICATION**

R If a spurious engine-out is detected :

R **Procedure**

R **– PRESS the EO CLR prompt of the MCDU PERF page**

R **– RE-ENGAGE previous vertical mode**

R **– RE-ENTER preselected speeds (if any).**
R No other consequences are to be expected.

CAT 3 DUAL INOPERATIVE

If "CAT 3 DUAL" is displayed in INOP SYS without any other failure being detected :

– CHANGE the AP in command. It may allow the CAT 3 DUAL function to be recovered.

If this procedure fails :

– SET FAC 1 pushbutton to OFF, and back to ON

– WAIT for FAC 1 fault ECAM warning to disappear, and

– APPLY the same sequence for FAC 2.

FM/GPS POS DISAGREE MESSAGE

This ECAM message is triggered when either one of the FM positions differs from either of the GPS positions by more than 0.5 minutes of latitude or longitude.
This may occur when an update of the FM positions is performed automatically by the FM (Takeoff update or loc update in approach with unprecise airfield or navaid position within the database), or manually by the pilot (manual update). For procedure, refer to abnormal procedure 3.02.34 and QRH.

MANUAL RESET OF FMGCs

The FMGC may, on rare occasions, require manual resetting. If this occurs in flight, reset one FMGC at a time.

MANUALLY RESETTING ONE FMGC

- Before resetting FMGC 1 (or 2), SWITCH OFF FD 1 (or 2).
  After applying external power or APU generator power, wait two minutes before resetting the FMGC circuit breakers.
- Pull the CB of the affected FMGC and reset it after five seconds. The circuit breakers for the FMGC's are :
  – AUTO FLT/FMGC 1 M16 ON 121 VU, or B2 ON 49 VU, with Mod 20748.
  – AUTO FLT/FMGC 2 M17 ON 121 VU

MANUALLY RESETTING BOTH FMGCs

When the aircraft is on the ground with engines stopped, the flight crew may attempt double and simultaneous CB resets when a single CB reset has failed.
Apply the procedure described above to both FMGCs.

ERRONEOUS PREDICTIONS

The FMGS may display temporary erroneous predictions that can affect such data as ECON speed/Mach, optimum flight level, fuel or time predictions.
If erroneous predictions are observed :

On ground, or in flight :

– Check the cruise temperature (sign and value), the gross weight, and the cruise flight level.

R **– REENTER the same cost index to restart a computation, or**

– MAKE a COPY ACTIVE, then activate the secondary, or

– MAKE a DIR TO the "TO" waypoint.

R **SPURIOUS ENGINE-OUT INDICATION**

R If a spurious engine-out is detected :

R **Procedure**

R **– PRESS the EO CLR prompt of the MCDU PERF page**

R **– RE-ENGAGE previous vertical mode**

R **– RE-ENTER preselected speeds (if any).**
R No other consequences are to be expected.

CAT 3 DUAL INOPERATIVE

If "CAT 3 DUAL" is displayed in INOP SYS without any other failure being detected :

– CHANGE the AP in command. It may allow the CAT 3 DUAL function to be recovered.

If this procedure fails :

– SET FAC 1 pushbutton to OFF, and back to ON

– WAIT for FAC 1 fault ECAM warning to disappear, and

– APPLY the same sequence for FAC 2.

FM/GPS POS DISAGREE MESSAGE

This ECAM message is triggered when either one of the FM positions differs from either of the GPS positions by more than 0.5 minutes of latitude or longitude.
This may occur when an update of the FM positions is performed automatically by the FM (Takeoff update or loc update in approach with unprecise airfield or navaid position within the database), or manually by the pilot (manual update). For procedure, refer to abnormal procedure 3.02.34 and QRH.

"CHECK GW MESSAGE"

"CHECK GW MESSAGE" appears on the MCDU when the gross weight computed by the FM and that computed by the FAC disagree by more than seven tons (16055 LB). When this message appears :

- **CALL UP the MCDU FUEL PRED page and CHECK the current GW (= main engine start weight from load sheet – fuel used) and correct it if necessary.**

- **If the current GW on the MCDU is correct. (FM characteristics speed displayed on the MCDU are correct).**
  DISREGARD the computed FAC characteristics speed (Vls, F, S, Green Dot) and refer to speeds given in the QRH.
  (FM characteristics speed displayed on the MCDU are correct).

- **If the load sheet seems to be the cause of the discrepancy**
  COMPARE FAC and QRH speeds, and select the most appropriate.

R ## "AUTO FLT A/THR OFF MESSAGE"

R "AUTO FLT A/THR OFF MESSAGE" may be displayed on the ECAM during cockpit
R preparation when the FCU A/THR pushbutton has been used on ground to arm and disarm
R the A/THR. (It is sometimes performed for maintenance purpose).

R **Procedure before engine start :**

R – **ARM the A/THR with the FCU pushbutton to clear the message.**
If one engine is started, the FCU pushbutton is inhibited until takeoff and the crew cannot clear the message.

R **Procedure after engine start :**

R – **WAIT until takeoff initiation, the warning will automatically disappear when the**
R **thrust levers are set to FLX or TOGA.**

R *Note : If the warning comes up after engine start, envisage an A/THR failure.*

MCDU LOCKED or BLANK

1. When one MCDU locks up, or becomes blank, all FMGS functions remain available, but the pilot cannot enter information into the MCDU, and cannot call up any MCDU pages for display.

   Procedure
   – PULL the CB for the locked or blank MCDU, and PUSH it back in after 10 seconds.

   Note : During a RESET/RESYNC, if the crew presses a key while the scratchpad is showing "PLEASE WAIT", there is no change at the MCDU level. This is normal, and the pilot should not respond by pulling the MCDU CB.

2. When both MCDUs are simultaneously locked up, the failure is usually due to an FMGC software anomaly.

   Procedure
   – Pull the FMGC1 CB and push it back in after 10 seconds. If unsuccessful, reset the FMGC2 CB.

R ## ERRONEOUS AIRCRAFT POSITION AFTER LANDING IN LOC MODE

R The following occurs when the approach of the previous flight was a "LOC-only" approach,
R performed in LOC AP/FD mode (LOC, LOC B/C, ILS with no G/S, LDA, SDF, ...) :
R On ground, the FMS erroneously computes the aircraft position, because the LOC update
R function erroneously remains active after landing.
R As a result, a map shift may occur or the ECAM may trigger the NAV FM/GPS POS
R DISAGREE caution (if GPS is installed) during the takeoff of the following flight.
R A manual reset of both FMGCs after landing will restore a correct FMS position. Refer to
R the paragraph "MANUAL RESET OF FMGCs" of this FCOM section.

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Procedure

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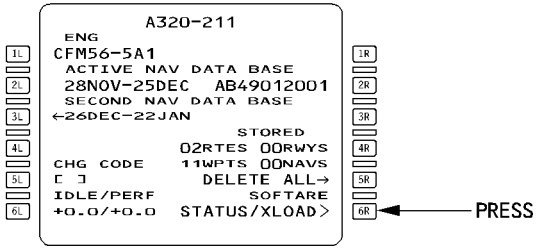
CROSSLOAD OF NAV DATABASE

Both FMGCs are sometimes loaded with 2 different NAV databases. The DUAL mode of operation is not possible until both FMGCs receive the same database. The MCDU displays
R "FMS1/FMS2 A/C STS DIFF".
This may occur when a spare FMGC is loaded on an aircraft very late before the flight. The crossload procedure will be applied to restore the DUAL mode of operations.
CROSSLOAD can be initiated during the preflight or done phases only.

CAUTION

The MCDU to be used is the MCDU of the FMGC loaded with the correct NAV database.

NFCS-04-0630-001-A11DAA



AIRCRAFT STATUS PAGE

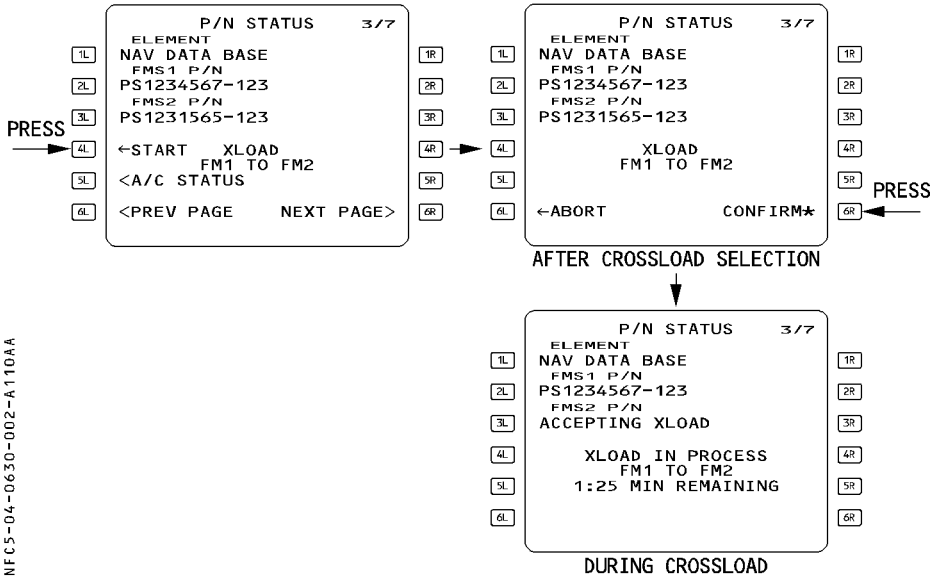
Procedure :

- **PRESS the "SOFTWARE STATUS/XLOAD" key, on the field [6R].**
  The P/N STATUS page appears.

- **SELECT "P/N STATUS" page 3.**
  The navigation database part numbers are displayed.

- **PRESS "START XLOAD" key, on the field [4L].**

- **PRESS "CONFIRM" key on the field [6R].**
  Crossloading is initiated and "XLOAD IN PROCESS" is displayed on both MCDUs.



Note : If flight phase transitions from PREFLIGHT or DONE while crossload is in process, the crossload is aborted. If crossload is unsuccessful "CROSSLOAD ABORTED" is displayed on both MCDU's scratchpad. This message is also displayed following a failed or incomplete data base loader operation.

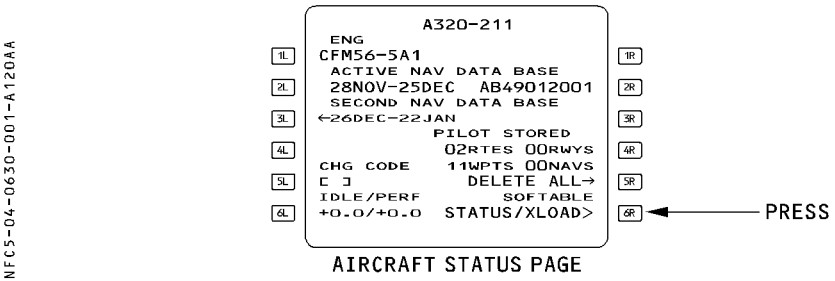
Upon successful completion of the crossload, "CROSSLOAD COMPLETE" message is displayed on each MCDUs scratchpad. A RESYNCH occurs and both MCDUs return to the AIRCRAFT STATUS page.

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Both FMGCs are sometimes loaded with 2 different NAV databases. The DUAL mode of operation is not possible until both FMGCs receive the same database. The MCDU displays "FMS1/FMS2 A/C STS DIFF".
This may occur when a spare FMGC is loaded on an aircraft very late before the flight. The crossload procedure will be applied to restore the DUAL mode of operations.
CROSSLOAD can be initiated during preflight or done phases only.

CAUTION

The MCDU to be used is the MCDU of the FMGC loaded with the correct NAV database.



AIRCRAFT STATUS PAGE

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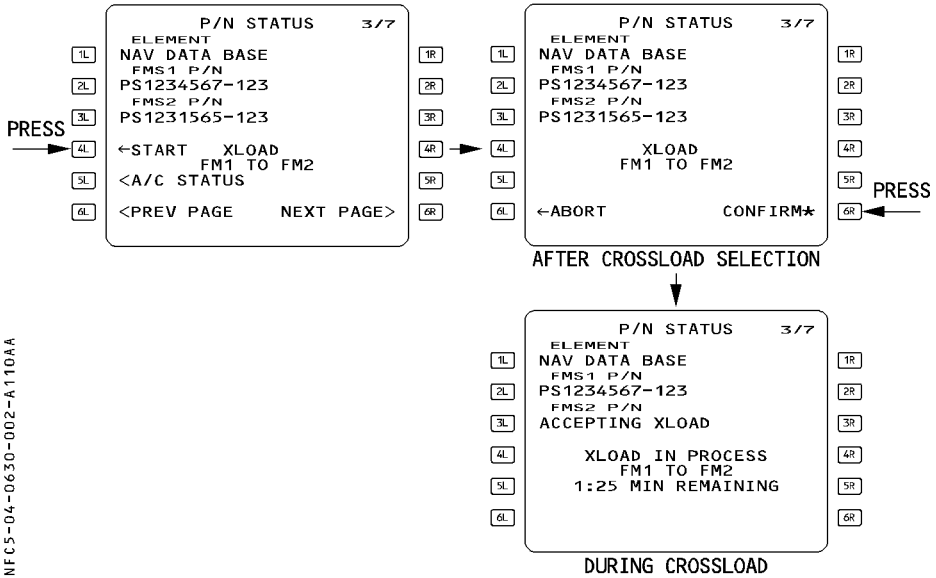
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Note : If flight phase transitions from PREFLIGHT or DONE while crossload is in process, the crossload is aborted. If crossload is unsuccessful "CROSSLOAD ABORTED" is displayed on both MCDU's scratchpad. This message is also displayed following a failed or incomplete data base loader operation.

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FMGC RESPONSE TO FAILURE CASES

This table shows how the FMGC responds to failures in other parts of the system.

R

FAILURE CASE	AP/FD	A/THR	LANDING CAPACITIES
FIRST IRS FAILURE	NO EFFECT	NO EFFECT	CAT 3 SINGLE
SECOND IRS FAILURE	TOTAL LOSS	TOTAL LOSS	RAW DATA
FIRST ADC FAILURE	NO EFFECT	NO EFFECT	CAT 3 SINGLE
SECOND ADC FAILURE	TOTAL LOSS	TOTAL LOSS	RAW DATA ONLY
FIRST LGCIU FAILURE	NO EFFECT	NO EFFECT	NO EFFECT
SECOND LGCIU FAILURE	TOTAL LOSS EXCEPT IN LAND MODE	TOTAL LOSS	RAW DATA ONLY EXCEPT IN LAND MODE (CAT 2 MAX)
LOSS OF ONE FMS COMPUTATION	LOSS OF ONE AP/FD/ATS EXCEPT IN APPR mode BELOW 700 FT AND GO-AROUND MODES		NO EFFECT BELOW 700 FT
FIRST SFCC FAILURE	NO EFFECT	NO EFFECT	NO EFFECT
SECOND SFCC FAILURE	TOTAL LOSS EXCEPT IN LAND MODE	TOTAL LOSS	Raw data EXCEPT IN LAND MODE (CAT 2 MAX)
FIRST RADIOALTIMETER FAILURE	NO EFFECT	NO EFFECT	CAT 2
SECOND RADIOALTIMETER FAILURE	TOTAL LOSS OF ILS APPR MODE	NO EFFECT	ILS APPR* MODE INOP
TOTAL LOSS OF THE FCU	TOTAL LOSS EXCEPT IN LAND AND GO AROUND	TOTAL LOSS	RAW DATA EXCEPT IN LAND MODE (CAT 2 MAX)
FIRST ILS RECEIVER FAILURE	NO EFFECT	NO EFFECT	CAT 1
SECOND ILS RECEIVER FAILURE	TOTAL LOSS IN APPR mode (ILS)	NO EFFECT	(ILS) APPR MODE INOP
FIRST ELAC FAILURE	NO EFFECT	NO EFFECT	CAT 3 single
SECOND ELAC FAILURE	TOTAL LOSS OF AP	NO EFFECT	CAT 1

R * LOC mode can be armed through the LOC pushbutton.

R

FAILURE CASE	AP/FD	A/THR	LANDING CAPACITIES
FIRST FAC FAILURE	NO EFFECT	NO EFFECT	CAT 3 SINGLE
SECOND FAC FAILURE	TOTAL LOSS, EXCEPT IN LAND MODE BELOW 100 FT AND BEFORE ROLLOUT	TOTAL LOSS	CAT 1 NO EFFECT BELOW 100 FT, if previously CAT 2/3
FIRST YAW DAMPER OR RUDDER TRIM FAILURE	NO EFFECT	NO EFFECT	CAT 3 SINGLE
SECOND YAW DAMPER OR RUDDER TRIM FAILURE	TOTAL LOSS OF AP, EXCEPT IN LAND MODE BELOW 100 FT AND BEFORE ROLLOUT	NO EFFECT	CAT 1 NO EFFECT BELOW 100 FT, if previously CAT 2/3
FIRST BSCU FAILURE	NO EFFECT	NO EFFECT	NO EFFECT
SECOND BSCU FAILURE	NO EFFECT	NO EFFECT	CAT 3 SINGLE
TOTAL LOSS OF ONE FADEC	NO EFFECT	TOTAL LOSS	CAT 2
LOSS OF EPR (IAE ONLY)	NO EFFECT	LOSS OF A/THR	CAT 2
FIRST FWC FAILURE	NO EFFECT	NO EFFECT	CAT 3 SINGLE
SECOND FWC FAILURE	NO EFFECT	NO EFFECT	CAT 1
LOSS OF PFD DATA ON ONE SIDE	NO EFFECT	NO EFFECT	CAT 1
TOTAL LOSS OF ONE FMGC	LOSS OF ONE AP/FD	LOSS OF ONE ATS	CAT 3 SINGLE
DOUBLE HYDRAULIC FAILURE	TOTAL LOSS OF AP	NO EFFECT	CAT 1

07.00 CONTENTS

07.10 GENERAL INDEX

07.00 CONTENTS

07.15 GENERAL INDEX

07.00 CONTENTS

07.18 GENERAL INDEX

1. GENERAL INDEX

- The following index lists the main terms used in the FMGS chapter.

A

ABNORMAL PROCEDURES : 4.06.20

ACARS FUNCTION ◁ : 1.22.45

ACARS page description ◁ : 4.03.20 p 57

ACCELERATION ALTITUDE : 4.03.20 **p 69** – 4.05.30 p 3 – 4.05.80 p 2-3

ACCURACY (HIGH-LOW) : 4.02.20 p 1 – 4.05.50 p 2 – 4.05.70 p 2 – 1.22.20 **p 7-8-9**

ACTIVE FLIGHT PLAN : 4.03.20 p **16 to 20** – 1.22.20 p 15-20

ACTIVE LEG : 4.03.20 p 17

ACT MODE : 4.03.20 p 70-72-74

AIRCRAFT POSITION : 4.03.20 p 52 – 1.22.20 p **2 to 6**

AIRCRAFT STATUS PAGE : 4.03.20 p 50

AIRPORT KEY : 1.22.10 p 11

AIRWAY INSERTION : 4.04.10 p 3

ALIGNMENT OF IRS : 4.05.10 p 4 – 1.22.20 p **14** – 4.03.20 p 5

ALPHANUMERIC KEYS : 4.03.10 p 1 – 1.22.10 p 11

ALTERNATE SELECTION REVISION : 4.03.20 p 30 – 4.04.10 **p 21**

ALTERNATE ROUTE : 4.03.20 **p 31** – 4.03.20 p 3

ALT ACQ MODE : 1.22.30 p 33

ALTITUDE HOLD MODE : 1.22.30 p 35

ALTITUDE CONSTRAINT
R CLIMB : 4.02.20 p **13** – 1.22.30 p 21 - 4.05.40 p 5
R DESCENT : 1.22.30 p 20 – 4.05.60 **p 4**
R

R ANNUNCIATORS (FMA) : 1.22.30 p **69 to 76** – 4.02.30 p 13

AP / FD MODES
TAKEOFF : 1.22.30 p 47-48
CLIMB : 1.22.30 p 20 to 24 – 4.02.30 p 4-5
CRUISE : 1.22.30 p 35-36 – 4.02.30 p 5
DESCENT : 1.22.30 p 25 to 33 – 4.02.30 p 6 to 11
APPROACH : 1.22.30 p 49 to 56 – 4.02.30 p 12
LANDING : 1.22.30 p 52
GO AROUND : 1.22.30 p 57

APPROACH PUSHBUTTON : 4.03.10 p 2 – 1.22.10 **p 22**

APPROACH PHASE (ACTIVATE) : 4.03.20 p 70-72-74

APPROACH PROCEDURE : 4.05.70 p 1 to 30
R ILS PROCEDURE 4.05.70 p 3 to 9
AUTOLAND 4.05.70 p 4 – p 10 to 13
NON PRECISION 4.05.70 p 21 to 28
GPS 4.05.70 p 22
CIRCLING 4.05.70 p 29
VISUAL 4.05.70 p 29-30

APPROACH TRANS : 4.03.20 p 23 – 1.22.20 **p 16 to 18**

R

APPROACH VIAS : 4.03.20 **p 29** – 1.22.20 p 16 to 18

ARRIVAL page : 4.03.20 p 28

ARROWS key : 1.22.10 p 11

R AUTOLAND WARNING : 4.05.70 p 15 – 1.22.30 p 53

AUTOPILOT : 1.22.30 p 7-8

AUTOTHRUST (A/THR) : 4.03.10 p 3 – 1.22.30 **p 58 to 68**

AUTOTHRUST MODE : 1.22.30 p 64-65

AUTOSPEED : 4.03.20 p 74-75 – 4.05.50 p 10 – 1.22.30 p 12

AUTOTUNING : 4.02.20 p 3 – 1.22.20 **p 11 to 13**

B

BARO SETTING : 4.04.30 p 1 to 3

BACK COURSE LOCALIZER APPROACH : 4.05.70 p 20

BEARING AND DISTANCE TO WPT : 4.03.20 p 80-p 82

BFO (BEAT FREQUENCY OSCILLATOR) : 4.03.20 p 86-87

BLOCK (FUEL) : 4.03.20 **p 12-13** – 4.05.10 p 16

BRACKETS : 1.22.10 p 14

BRIGHTNESS CONTROL : 4.03.10 p 1 – 1.22.10 p 10

C

CIRCLING APPROACH : 4.05.70 p 29

CITY PAIR : 4.03.20 **p 5** – 4.02.20 p 7

CLEAR KEY : 4.03.10 p **1** – 4.04.30 **p 5** – 1.22.10 p 10

CLEARING FUNCTION : 4.04.30 p 5

CL DETENT : 4.03.10 p 3 – 1.22.30 p **59**

CLIMB MODE : 4.02.30 p 4 – 1.22.30 **p 20 to 22**

CLIMB PHASE : 4.05.40 – 4.02.20 p 11

CLIMB SPD LIMIT : 4.03.20 p 32-33 – 4.05.10 **p 7**

CG : 4.03.20 p 13 – p 14

CG (ZFWCG) : 4.03.20 p 13

COMMON MODES : 1.22.30 p 46 to 68

COMPANY ROUTE : 4.03.20 p 3 – 4.02.20 **p 6 p 7** – 4.05.10 p 3

CONFIRM APPR PROMPT : 4.03.20 p 70-72-74

CONFIRM UPDATE AT : 4.03.20 p 80-81-82

CONSTRAINT : 4.02.20 p 13 – 1.22.30 p 21 – 4.05.40 p 5 – 4.05.60 p 4

COPYING ACTIVE FLIGHT PLAN TO SECONDARY : 4.03.20 p 89 – 4.04.30 p 17

COST INDEX : 4.03.20 p 70-72 p 74 – 4.02.20 **p 16** – 1.22.20 p 24

COST INDEX LRC : 4.05.50 p 14

CROSS TALK : 1.22.10 p 7

CROSS LOAD ◁ : 4.06.30 p 1 - p 2

CRUISE LEVEL : 4.03.20 **p 80** – 4.02.30 p 5 – 4.05.50 p 1

CRUISE ALTITUDE CHANGE : 4.05.50 **p 7** – 4.05.50 p 1

D

R DATABASE : 1.22.10 p 2

DATABASE VALIDITY : 1.22.10 p 2

DATA ENTRY : 4.02.20 p 10

DATA PAGES : 4.03.20 p 36 to 55

DEFAULT DATA : ZFWCG : 4.03.20 p 12 HOLD 4.04.10 p 10

DELETE ALL : 4.03.20 **p 50**

DEPARTURE PAGE : 4.03.20 p 22

DES CABIN RATE : 4.03.20 p 11 or 4.03.20 p 72-73 ◁

DES FORECAST : 4.03.20 p 11 – 4.03.20 p 72-73 ◁

DES MODE : 4.05.60 p 1 p 2 – 4.02.30 **p 6 to 11** – 1.22.30 p 25 to 31

DESCENT PROFILE : 4.02.30 p 6-7

DESELECT : 4.03.20 p 53 – 4.05.10 p 2

DH : 4.03.20 p 77

DIR DIST TO DEST : 4.03.20 **p 81** – 4.02.20 p 20 – 4.05.60 p 6

R DIR TO : 4.03.20 p 27 – 4.04.10 **p 26-27**

DISCONTINUITY IN F.PLN : 4.04.30 **p 5** – 1.22.20 p 17 – 4.04.10 **p 28**

DIST TO DEST : 4.03.20 p 17

DIVERSION
NEW DESTINATION : 4.04.10 p 7 – 4.03.20 p 20
ALTERNATE : 4.03.20 p 30 – 4.04.10 p 21

DONE PHASE : 4.02.20 p 11

DOWNLINK MESSAGE : 4.03.20 p 57-58 – 1.22.45 **p 2**

DUAL MODE : 1.22.10 p 7

DUPLICATE : 4.03.20 p 51

E

ECON CRUISE : 4.03.20 p 72 – 1.22.20 p 23 – 4.02.20 **p 14**

ECON DESCENT : 4.03.20 p 74 – 1.22.20 p 22

ECON MODE : 4.03.20 p 70 p 72 p 74 – 4.02.20 **p 14**

EFIS : 1.22.10 p 4

EFOB : 4.03.20 p 14 – 4.03.20 p 17 p 19

EMERGENCY RETURN : 4.05.40 p 8

ENERGY CIRCLE ◁ : 1.22.20 p 27 – 4.02.20 **p 18**

ENGINE OUT : 4.04.30 **p 10 to 16**
TO : 4.0.430 p 12 to 14
CLIMB : 4.04.30 p 14
CRUISE : 4.04.30 p 15
DESCENT : 4.04.30 p 16
APPROACH : 4.04.30 p 16
GO AROUND : 4.04.30 p 16

ETA : 4.03.20 p 15 p 16

E.T.T. : 4.03.20 p 32 – 4.05.10 p 14

EXIT (IMM EXIT : 4.04.10 **p 14**
FROM ACTIVE HOLD

EXPEDITE ◁ : 4.05.40 p 7 – 1.22.30 **p 39 – 40**

F

FAC : 1.22.40 p 4

FAIL ANNUNCIATOR : 1.22.10 **p 11**

FAILURES AND ASSOCIATED PROCEDURES (DURING CAT II and CAT III : 4.05.70 p 17-18-19

FAST ALIGNMENT : 4.05.10 p 4 – 1.22.20 p 14

FIGURE OF MERIT : 4.03.20 p 41

FLAP RETRACTION SPEED (F) : 4.03.20 p 68 – p 76

FLEX TO TEMP : 4.03.20 p 68

FLIGHT DIRECTOR : 1.22.30 p 3

FLIGHT GUIDANCE PRINCIPLES : 4.02.30

FLIGHT MANAGEMENT PRINCIPLES : 4.02.20 – 1.22.20

FLIGHT NUMBER : 4.03.20 p 4

FLIGHT OPTIMIZATION : 4.02.20 p 14 p 15 p 16 – 1.22.20 **p 21 p 22 p 23**

FLIGHT PHASES : 4.02.20 p 11

FLIGHT PATH ANGLE MODE : 1.22.30 p 37 p 38

FLIGHT PLAN CONSTRUCTION : 4.02.20 p 6 to p 9 – 4.05.10 p 3 p 4

FMA ANNUNCIATION : 1.22.30 **p 69 to 76** – 4.02.30 p 13

FMA MESSAGES : 1.22.30 p 76

FMGS ABNORMALITIES : 4.06.20 p 1 to 7

F-PLN KEY : 4.03.10 p 1 – 1.22.10 p 10

F-PLN DISCONTINUITY : 4.04.30 p 5 – 1.22.20 p 17 – 4.04.10 **p 28**

F-PLN PAGE : 4.03.20 p 16 to 21

FREEZE PROMPT : 4.03.20 p 53

FROM WAYPOINT : 4.03.20 p 17

FUEL ON BOARD (FOB) : 4.03.20 p 15

FUEL PREDICTION : 4.03.20 p 14-15 – p 19

FUEL TAXI : 4.03.20 p 12-13

FUEL PRED KEY AND PAGE : 4.03.20 **p 14 p 15** – 4.03.10 p 1

FUEL SENSORS : 4.03.20 p 15

G

R GLIDE : 4.05.70 p 8A

R GO AROUND MODE : 1.22.30 p 57

GO AROUND PROCEDURE : 4.05.80 p 1 to 5

GO AROUND PERF page : 4.03.20 p 78-79

R GO AROUND TRACK : 1.22.30 p 57

GO TO : refer to VIA/GO TO

GPS ◁ : 1.22.20 p 2

GPS approach : 4.05.70 p 22

GPS MONITOR PAGE ◁ : 4.03.20 p 55

GREEN DOT SPEED : 4.03.20 p 68-69 – p 78 - 79

GROSS WEIGHT : 4.03.20 p 14 – 4.05.10 **p 16-17**

GROUND SPEED MINI : 1.22.30 p 66-67-68

GUIDANCE (MANAGED, SELECTED) : 4.02.30 **p 1** – 1.22.10 p 2 – 1.22.30 p 1

H

HDG MODE : 1.22.30 **p 16** – 4.02.30 p 2

R HDG-TRK PRESET : 4.05.10 p 23 – 4.05.80 p 1 – 1.22.30 p 16

HIGH ACCURACY : 4.02.20 **p 2** – 1.22.20 p 8

HOLD PAGES : 4.03.20 p 24 to 26

HOLDING PATTERN : 4.04.10 p 8 to 17

HOLD PROMPT : 4.03.20 p 24

I

ILS APPROACH : 4.05.70 p 3 to 9

ILS IDENT / FREQ. : 4.03.20 p 86

ILS TUNING : 4.03.20 p 86 – 4.05.70 **p 4 p 7**

IMM EXIT : 4.04.10 **p 14**

INDEPENDENT OPERATION : 1.22.10 p 8 – 4.06.10 **p 1**

INIT PAGE (INITIALIZATION) : 4.03.20 p 3 to 5 – p 19-20

INTERFACES : 4.03.10 p 1 to 5

IRS ALIGNMENT : 4.03.20 p 5 – 4.05.10 p 4 – 1.22.20 **p 14**

IRS POSITION, MIX IRS : 1.22.20 p 2

K

KEY, ALPHANUMERIC KEYS : 4.03.10 p 1 – 1.22.10 p 10 p 11

L

LAND MODE : 4.05.70 p 4 – 1.22.30 p 52

LANDING CATEGORIES : 4.05.70 p 14

LANDING CONF. : 4.03.20 p 77

LATERAL F.PLN : 4.02.20 p 5 p 6 – 4.05.10 p 5 p 6

R LATERAL MODES : 1.22.30 p 14 **to 19**

LATERAL REVISION : 4.03.20 p 20 to 31

AT ORIGIN : 4.03.20 p 21 p 22

AT DESTINATION : 4.03.20 p 28 p 29

LEGS : 4.03.20 p 17

LEVEL CHANGE : 4.03.20 p 35 – 4.05.50 p 6 **p 7**

LEVEL OFF : 4.05.50 p 1

LINE SELECT KEY : 4.03.10 p 1 – 1.22.10 p 10

LOC MODE : 1.22.30 p 19 – 4.05.70 p 27

LOW ACCURACY : 1.22.20 **p 7 p 8** – 4.05.70 p 2

M

MACH MODE : 1.22.30 p 65

MANAGED GUIDANCE : 4.01.10 p 2 – 4.02.30 **p 1**

MANAGED SPEED : 1.22.30 p 1 p 13

R MANUAL LEG : 4.04.10 p 28 – 1.22.20 **p 18**

MANUAL NAV RADIO TUNING : 4.02.20 p 4

MAX REC ALTITUDE : 4.03.20 p 81

MCDU DATA LIST : 4.03.40

MCDU MESSAGES : 4.03.30

MCT : 1.22.30 p 59

MDA / MDH : 4.03.20 p 77

MENU (MCDU) : 4.03.20 p 2

MESSAGES (MCDU) : 4.03.30

MIN FUEL : 4.02.20 p 16

MINI GS : 1.22.30 p 66-67-68

MISSED APPROACH : 4.02.20 p 6 – 4.05.80 **p 4**

MODES SELECTOR : 4.03.10 p 2 – 1.22.10 p 17 to 23

MODE OF OPERATION : 1.22.10 p 7 to 9

N

NAVAID PAGE : 4.03.20 p 40
NAVIGATION MODES : 1.22.20 p 7
NAV : 1.22.30 p 17-18
NAVAID TUNING : 4.02.20 p 3-4 – 1.22.20 p 11
NEXT PAGE KEY : 4.03.10 p 1 – 1.22.10 p 11
NEXT WPT : 4.03.20 p 17 – 4.04.10 p 4-5
NEW DEST : 4.03.20 p 20-21 – 4.04.10 **p 7-8**
NEW NAVAID (PAGE) : 4.03.20 p 40
NEW WAYPOINT (PAGE) : 4.03.20 p 38
NON PRECISION APPROACH : 4.05.70 **p 21 to 28**
1.22.30 **p 54 to 56**

O

OFFSET : 4.03.20 p 21 – 4.04.10 **p 19-20**
OPEN CLB MODES : 1.22.30 **p 23-24**
OPEN DES MODE : 1.22.30 **p 32-33** – 4.05.60 p 6
OPT FLIGHT LEVEL : 4.03.20 p 81 – 4.02.20 p 15 - 1.22.20 p 23
ORIGIN / DESTINATION : 4.03.20 p 5
OPTIMIZATION : 4.02.20 p 14 to 16 – 1.22.20 p 21 to 23
OVERFLY KEY : 4.04.10 p 29 – 1.22.10 p 11

P

PERF PAGES TAKE OFF : 4.03.20 p 68-69
CLB : 4.03.20 p 70-71
CRZ : 4.03.20 p 72-73
DES : 4.03.20 p 74-75
APPR : 4.03.20 p 76-77
GO-AROUND : 4.03.20 p 78

PERFORMANCE FUNCTION : 4.02.20 p 14 to 22 – 1.22.20 p 21 to 28

PERFORMANCE FACTOR : 4.03.20 p 50

PHASES OF FLIGHT : 4.02.20 p 11 – 1.22.20 p 20

PLACE / BEARING / DISTANCE : 4.03.20 p 39 and 81/82

PLACE-BEARING / PLACE-BEARING : 4.03.20 p 39 and p 81-82

POSITION MONITOR PAGE : 4.03.20 p 52-53

POSITION UPDATE :
AUTOMATIC 1.22.20 p 4-5-6
MANUAL 4.03.20 p 81-82 – 4.0.4.10 p 30

PPOS : 4.03.20 p 20 – 4.04.10 p 28

PREDICTIONS : 4.02.20 p 17 to 22 – 1.22.20 p 24 to 28

PREDICTIVE GPS ◁ : 4.03.20 p 84

PREFLIGHT PHASE : **4.05.10** – 4.02.20 p 11

PRINTER ◁ : 4.03.20 p 64-65 – 1.22.46 p 1

R PROG PAGES : 4.03.20 p 80 to 83

Q

QNH : 4.03.20 p 76 – 4.04.30 p 1 to 4

R

RADIO NAV PAGE : 4.03.20 p 86

REPORT (ACARS/PRINT) ◁ : 1.22.45 p 6-7-8 – 1.22.46 p 1

REQUIRED DISTANCE TO LAND : 4.03.20 p 81 or 4.02.20 p 20 – 4.05.60 p 6

R :

RESERVE FUEL : 4.03.20 p 14 p 15

RESET (FMGC reset) : 4.06.20 p 1 to 4

RESUME HOLD PROMPT : 4.04.10 p 15

RETARD MODE : 1.22.30 p 65 – 4.05.70 p 11-12-13

R REVERSION : 1.22.30 p 40a to 45

REVISION LATERAL : 4.03.20 p 20 to 31 – 4.04.10 p 1 to 8
VERTICAL 4.03.20 p 32 to 35 – 4.04.20 p 1 to 3

ROUTE PAGE : 4.03.20 **p 47-48** – 4.03.20 p 31

RMP TUNING : 4.02.20 p 4

RNP (REQUIRED NAVIGATION PERFORMANCE) : 4.03.20 p 83 – 1.22.20 **p 8**

RUNWAY PAGES : 4.03.20 p 44-45

RUNWAY LENGTH : 4.03.20 p 45

RUNWAY SELECTION : 4.03.20 p 22-23

RUNWAY (RWY) MODE : 1.22.30 **p 48** – 4.05.30 p 1

S

SECONDARY FLIGHT PLAN : 4.03.20 p 88-89 – 4.04.30 **p 17-18**

SELECTED GUIDANCE : 4.01.10 p 2 – 4.02.30 p 1

SELECTED NAVAID PAGE : 4.03.20 **p 53** – 4.02.20 p 3

SELECTED SPEED : 1.22.30 p 11

SCRATCHPAD : 1.22.10 p 10-12

SLEW KEY : 4.03.10 p 1 – 1.22.10 p 11

SID : 4.03.20 **p 22-23** – 4.02.20 p 6

SINGLE MODE : 1.22.10 p 9 – 4.06.10 p 2

SOFT ALTITUDE : 4.02.30 p 5 – 4.05.50 p 1 – 1.22.30 p 36

SLAT RETRACTION SPEED (S) : 4.03.20 p 68 - p 76-78

SPEED CONSTRAINT : 4.02.20 p 13 – 4.05.10 **p 8**

SPEED MODE : 1.22.30 p 65-66 – 1.22.30 p 2

SPEED LIMIT : 4.02.20 p 12 – 4.05.10 p 7

SRS MODE : 1.22.30 **p 47 -** p 57

STAR : 4.03.20 p 28-29 – 4.02.20 p 6

STATION DECLINATION : 4.03.20 p 41

STATUS PAGE : 4.03.20 p 50

STEP CLIMB/STEP DESCENT : 4.05.50 p 6 – 4.03.20 p 35

STORED NAVAIDS : 4.03.20 p 42

STORED WAYPOINTS : 4.03.20 p 39

STORED RUNWAYS : 4.03.20 p 45

STORED ROUTE : 4.03.20 p 48 – 4.04.30 **p 19**

T

TAKE OFF PERF PAGE : 4.03.20 p 68-69
PROG PAGE 4.03.20 p 80

TAKE OFF MODE : 1.22.30 p 47-48 – 4.05.30 p 1-2

TAKE OFF SHIFT : 4.03.20 **p 68-69** – 4.05.15 p 2

TAXI FUEL : 4.03.20 p 12-13

TEMPORARY F.PLN (TMPY) : 4.04.10 **p 2** – 1.22.20 p 19 – 4.03.20 p 21

THRUST CONTROL : 1.22.30 p 62 p 64-65

THRUST LEVERS : 4.03.10 p 3 – 1.22.30 p 59

R THRUST REDUCTION ALTITUDE : 4.03.20 **p 68-78** – 4.05.30 p 2 – 4.05.80 p 2-3

TIME CONSTRAINT ◁ : 4.04.20 p 2

TIME OUT : 4.06.20 p 2-3

TMPY – TEMPORARY F.PLN : 4.03.20 p 21 – 4.04.10 **p 2** – 1.22.20 p 19

TOO STEEP PATH : 4.02.30 **p 10** – 4.05.60 p 8 – 1.22.30 p 31

TOP OF CLIMB : 4.02.20 p 17

TOP OF DESCENT : 4.02.20 p 17 – 4.02.30 p 8

R TOW : 4.03.20 p 12

TO WAYPOINT : 4.03.20 p 17

TRK / HDG PRESET : 1.22.30 p 16-17 – 4.05.30 p 3 – 4.05.80 p 1

TRANS : 4.03.20 p 22-29 – 4.02.20 p 6

TRANSITION ALTITUDE : 4.03.20 p 68 – 4.03.20 **p 76-77**

TURN POINT (T.P.) : 4.02.20 p 8 – 4.04.10 **p 26-27**

U

UNFREEZE : 4.03.20 p 53

UPDATE AT : 4.03.20 **p 81-82** – 4.04.10 p 30

UPLINK MESSAGE (ACARS) ◁ : 4.04.40 p 2 p 4 p 7

V

VAPP : 1.22.30 **p 66-67-68** – 4.03.20 p 76-77

V/DEV : 4.02.20 **p 22** – 4.03.20 p 81 – 1.22.30 p 27 - p 56

« V » SPEEDS : 4.03.20 p 68 p 76 p 78

VERTICAL FUNCTIONS : **4.04.20 p 1**

VERTICAL SPEED – FLIGHT PATH ANGLE : 1.22.30 **p 37-38** – 4.02.30 p 3

VIA/GO TO : 4.03.20 p 20-21 – 4.04.10 **p 3**

VIA (APPROACH VIA) : 4.03.20 **p 28-29** 4.02.20 p 6

VISUAL APPROACH : 4.05.70 p 29-30

VOR TUNING : 1.22.20 p 11-12 – 4.03.20 **p 83** 4.02.20 p 3

W

WAYPOINT INSERTION : 4.04.10 p 4

WIND ENTRIES : 4.03.20 p 8 to 11
4.04.20 p 3 to 8

WIND FORECAST : 4.02.20 p 15

WIND PAGE : 4.03.20 p 8 to 11
* CLIMB 4.03.20 p 8-9
* CRUISE 4.03.20 p 10
* DESCENT 4.03.20 p 11

Z

ZFWCG/ZFW : 4.03.20 p 12 – 4.05.10 p 16-17

1. GENERAL INDEX

- The following index lists the main terms used in the FMGS chapter.

A

ABNORMAL PROCEDURES : 4.06.20

ABEAM INTCP : 4.04.15 p 12

ACARS FUNCTION : 1.22.45

ACARS page description : 4.03.25 p 84

ACCELERATION ALTITUDE : 4.03.25 **p 95** – 4.05.30 p 3 – 4.05.80 p 2-3

ACCURACY (HIGH-LOW) : 4.02.20 p 1 – 4.05.50 p 2 – 4.05.70 p 2 – 1.22.20 **p 7-8-9**

ACTIVE FLIGHT PLAN : 4.03.25 p **18 to 22** – 1.22.20 p 15-20

ACTIVE LEG : 4.03.25 p 19

ACT MODE : 4.03.25 p 96-98-100

AIRCRAFT POSITION : 4.03.25 p 70 – 1.22.20 p **2 to 6**

AIRCRAFT STATUS PAGE : 4.03.25 p 64

AIRPORT KEY : 1.22.10 p 11

AIRWAY INSERTION : 4.04.15 p 3

AIRWAYS PAGE : 4.03.25 p 27

ALIGNMENT OF IRS : 4.05.10 p 4 – 1.22.20 p **14** – 4.03.25 p 5

ALONG TRACK OFFSET : 4.04.15 p 8

ALPHANUMERIC KEYS : 4.03.10 p 1 – 1.22.10 p 11

ALTERNATE SELECTION : 4.03.25 p 38 – 4.04.15 **p 28**
REVISION

ALTERNATE ROUTE : 4.03.25 **p 39** – 4.03.25 p 3

ALT ACQ MODE : 1.22.30 p 33

ALTITUDE CONSTRAINT
CLIMB : 4.02.20 p **13** – 1.22.30 p **21** – 4.05.40 p 5
DESCENT : 1.22.30 p 20 – 4.05.60 **p 4**

ALTITUDE HOLD MODE : 1.22.30 p 35

ANNUNCIATORS (FMA) : 1.22.30 p **69 to 76** – 4.02.30 p 13

AP / FD MODES
- TAKEOFF : 1.22.30 p 47-48
- CLIMB : 1.22.30 p 20 to 24 – 4.02.30 p 4-5
- CRUISE : 1.22.30 p 35-36 – 4.02.30 p 5
- DESCENT : 1.22.30 p 25 to 33 – 4.02.30 p 6 to 11
- APPROACH : 1.22.30 p 49 to 56 – 4.02.30 p 12
- LANDING : 1.22.30 p 52
- GO AROUND : 1.22.30 p 57

APPROACH PUSHBUTTON : 4.03.10 p 2 – 1.22.10 **p 22**

APPROACH PHASE (ACTIVATE) : 4.03.25 p 96-98-100

APPROACH PROCEDURE : 4.05.70 p 1 to 30
- ILS PROCEDURE 4.05.70 p 3 to 9
- AUTOLAND 4.05.70 p 4 – p 10 to 13
- NON PRECISION 4.05.70 p 21 to 28
- BACK COURSE LOCALIZER 4.05.70 p 20
- GPS 4.05.70 p 22
- CIRCLING 4.05.70 p 29
- VISUAL 4.05.70 p 29-30

APPROACH TRANS : 4.03.25 p 29 – 1.22.20 **p 16 to 18**

APPROACH VIAS : 4.03.25 **p 37** – 1.22.20 p 16 to 18

ARRIVAL page : 4.03.25 p 36

ARROWS key : 1.22.10 p 11

AUTOLAND WARNING : 4.05.70 p 15 – 1.22.30 p 53

AUTOPILOT : 1.22.30 p 7-8

AUTOTHRUST (A/THR) : 4.03.10 p 3 – 1.22.30 **p 58 to 68**

AUTOTHRUST MODES : 1.22.30 p 64-65

AUTOTUNING : 4.02.20 p 3 – 1.22.20 **p 11 to 13**

B

BARO SETTING : 4.04.30 p 1 to 3

BACK COURSE LOCALIZER APPROACH : 4.05.70 p 20

BEARING AND DISTANCE TO WPT : 4.03.25 p 106-108

BFO (BEAT FREQUENCY OSCILLATOR) : 4.03.25 p 114-115

BLOCK (FUEL) : 4.03.25 **p 12-13** – 4.05.10 p 16

BRACKETS : 1.22.10 p 14

BRIGHTNESS CONTROL : 4.03.10 p 1 – 1.22.10 p 10

C

CIRCLING APPROACH : 4.05.70 p 29

CITY PAIR : 4.03.25 **p 5** – 4.02.20 p 7

CLEAR KEY : 4.03.10 p **1** – 4.04.30 **p 5** – 1.22.10 p 10

CLEARING FUNCTION : 4.04.30 p 5

CL DETENT : 4.03.10 p 3 – 1.22.30 p **59**

CLIMB MODE : 4.02.30 p 4 – 1.22.30 **p 20 to 22**

CLIMB PHASE : 4.05.40 – 4.02.20 p 11

CLIMB SPD LIMIT : 4.03.25 p 40-41 – 4.05.10 **p 7**

CLOSEST AIRPORTS PAGE : 4.03.25 p 78

CG : 4.03.25 p 13 – p 16

CG (ZFWCG) : 4.03.25 p 13

COMMON MODES : 1.22.30 p 46 to 68

COMPANY ROUTE : 4.03.25 p 3 – 4.02.20 **p 6 p 7** – 4.05.10 p 3

CONFIRM APPR PROMPT : 4.03.25 p 96-98-100

CONFIRM UPDATE AT : 4.03.25 p 106-107-108

CONSTANT MACH SEGMENT : 4.04.25 p 12 – 4.03.25 p 40

CONSTRAINT : 4.02.20 p 13 – 1.22.30 p 21 – 4.05.40 p 5 – 4.05.60 p 4

COPYING ACTIVE FLIGHT PLAN TO SECONDARY : 4.03.25 p 116-117 – 4.04.30 p 17

COST INDEX : 4.03.25 p 96-98-100 – 4.02.20 **p 16** – 1.22.20 p 24

COST INDEX LRC : 4.05.50 p 14

CROSS TALK : 1.22.10 p 7

CROSS LOAD : 4.06.30 p 1 - p 2

CRUISE LEVEL : 4.03.25 **p 106** – 4.02.30 p 5 – 4.05.50 p 1

CRUISE ALTITUDE CHANGE : 4.05.50 **p 7** – 4.05.50 p 1

D

DATABASE : 1.22.10 p 2

DATABASE VALIDITY : 1.22.10 p 2

DATA ENTRY : 4.02.20 p 10

DATA PAGES : 4.03.25 p 48 to 81

DEFAULT DATA : ZFWCG : 4.03.25 p 12 HOLD 4.04.10 p 10

DELETE ALL : 4.03.25 **p 64-65**

DEPARTURE PAGE : 4.03.25 p 28

DES CABIN RATE : 4.03.25 p 98-99

DES MODE : 4.05.60 p 1 p 2 – 4.02.30 **p 6 to 11** – 1.22.30 p 25 to 31

DESCENT PROFILE : 4.02.30 p 6-7

DESELECT : 4.03.25 p 71 – 4.05.10 p 2

DH : 4.03.25 p 103

DIR TO : 4.03.25 p 33 – 4.04.15 **p 33**

DISCONTINUITY IN F.PLN : 4.04.30 **p 5** – 1.22.20 p 17 – 4.04.15 **p 36**

DIST TO DEST : 4.03.25 p 19

DIVERSION
NEW DESTINATION : 4.04.15 p 14 – 4.03.25 p 22
ALTERNATE : 4.03.25 p 38 – 4.04.15 p 28

DONE PHASE : 4.02.20 p 11

DOWNLINK MESSAGE : 4.03.25 p 85-86 – 1.22.45 **p 2**

DUAL MODE : 1.22.10 p 7

DUPLICATE : 4.03.25 p 69

E

ECON CRUISE : 4.03.25 p 98 – 1.22.20 p 23 – 4.02.20 **p 14**

ECON DESCENT : 4.03.25 p 100 – 1.22.20 p 22

ECON MODE : 4.03.25 p 96-98-100 – 4.02.20 **p 14**

EFIS : 1.22.10 p 4

EFOB : 4.03.25 p 16 – 4.03.25 p 19-21

EMERGENCY RETURN : 4.05.40 p 8

END WPT : 4.03.25 p 42

ENERGY CIRCLE : 1.22.20 p 27 – 4.02.20 **p 18**

ENGINE OUT : 4.04.30 **p 10 to 16**
TO : 4.04.30 p 12 to 14
CLIMB : 4.04.30 p 14
CRUISE : 4.04.30 p 15
DESCENT : 4.04.30 p 16
APPROACH : 4.04.30 p 16
GO AROUND : 4.04.30 p 16

EQUITIME POINT : 4.03.25 p 80 – 4.04.30 p 22

ETA : 4.03.25 p 46-47

E.T.T. : 4.03.25 p 46-47 – 4.05.10 p 14

EXIT (IMM EXIT FROM ACTIVE HOLD : 4.04.15 **p 21**

EXPEDITE : 4.05.40 p 7 – 1.22.30 **p 39 – 40**

F

FAC : 1.22.40 p 4

FAIL ANNUNCIATOR : 1.22.10 **p 11**

FAILURES AND ASSOCIATED PROCEDURES (DURING CAT II and CAT III : 4.05.70 p 17-18-19

FAST ALIGNMENT : 4.05.10 p 4 – 1.22.20 p 14

FIGURE OF MERIT : 4.03.25 p 53

FLAP RETRACTION SPEED (F) : 4.03.25 p 94 – p 102

FLEX TO TEMP : 4.03.25 p 94

FLIGHT DIRECTOR : 1.22.30 p 3

FLIGHT GUIDANCE PRINCIPLES : 4.02.30

FLIGHT MANAGEMENT PRINCIPLES : 4.02.20 – 1.22.20

FLIGHT NUMBER : 4.03.25 p 4

FLIGHT OPTIMIZATION : 4.02.20 p 14 p 15 p 16 – 1.22.20 **p 21 p 22 p 23**

FLIGHT PHASES : 4.02.20 p 11

FLIGHT PATH ANGLE MODE : 1.22.30 p 37 p 38

FLIGHT PLAN CONSTRUCTION : 4.02.20 p 6 to p 9 – 4.05.10 p 3 p 4

FMA ANNUNCIATION : 1.22.30 **p 69 to 76** – 4.02.30 p 13

FMA MESSAGES : 1.22.30 p 76

FMGS ABNORMALITIES : 4.06.20 p 1 to 7

F-PLN KEY : 4.03.10 p 1 – 1.22.10 p 10

F-PLN DISCONTINUITY : 4.04.30 p 5 – 1.22.20 p 17 – 4.04.15 **p 36**

F-PLN PAGE : 4.03.25 p 18 to 21

FREEZE PROMPT : 4.03.25 p 71

FROM WAYPOINT : 4.03.25 p 19

FUEL ON BOARD (FOB) : 4.03.25 p 17

FUEL PLANNING : 4.03.25 p 13

FUEL PREDICTION : 4.03.25 p 16-17 – p 21

FUEL TAXI : 4.03.25 p 12-13

FUEL PRED KEY AND PAGE : 4.03.25 **p 16-17** – 4.03.10 p 1

FUEL SENSORS : 4.03.25 p 17

G

GLIDE : 4.05.70 p 8A

GO AROUND MODE : 1.22.30 p 57

GO AROUND PROCEDURE : 4.05.80 p 1 to 5

GO AROUND PERF page : 4.03.25 p 104-105

GO AROUND TRACK : 1.22.30 p 57

GPS : 1.22.20 p 2

GPS approach : 4.05.70 p 22

GPS MONITOR PAGE : 4.03.25 p 76

GREEN DOT SPEED : 4.03.25 p 94-95 – p 104-105

GROSS WEIGHT : 4.03.25 p 16 – 4.05.10 **p 16-17**

GROUND SPEED MINI : 1.22.30 p 66-67-68

GUIDANCE (MANAGED, SELECTED) : 4.02.30 **p 1** – 1.22.10 p 2 – 1.22.30 p 1

H

HDG MODE : 1.22.30 **p 16** – 4.02.30 p 2

HDG-TRK PRESET : 4.05.10 p 23 – 4.05.80 p 1 – 1.22.30 p 16

HIGH ACCURACY : 4.02.20 **p 2** – 1.22.20 p 8

HOLD PAGES : 4.03.25 p 30 to 32

HOLDING PATTERN : 4.04.15 p 15 to 25

HOLD PROMPT : 4.03.25 p 30

I

IDLE PERF : 4.03.25 p 64

ILS APPROACH : 4.05.70 p 3 to 9

ILS IDENT / FREQ : 4.03.25 p 114

ILS TUNING : 4.03.25 p 114 – 4.05.70 **p 4 p 7**

IMM EXIT : 4.04.15 **p 21**
INDEPENDENT OPERATION : 1.22.10 p 8 – 4.06.10 **p 1**
INIT PAGE (INITIALIZATION) : 4.03.25 p 3 to 5
INTERFACES : 4.03.10 p 1 to 5
IRS ALIGNMENT : 4.03.25 p 5 – 4.05.10 p 4 – 1.22.20 **p 14**
IRS MONITOR PAGE : 4.03.25 p 74
IRS PAGES : 4.03.25 p 75
IRS POSITION, MIX IRS : 1.22.20 p 2

K

KEY, ALPHANUMERIC KEYS : 4.03.10 p 1 – 1.22.10 p 10 p 11

L

LAND MODE : 4.05.70 p 4 – 1.22.30 p 52
LANDING CATEGORIES : 4.05.70 p 14
LANDING CONF. : 4.03.25 p 103
LATERAL F.PLN : 4.02.20 p 5 p 6 – 4.05.10 p 5 p 6
LATERAL MODES : 1.22.30 p 14 **to 19**
LATERAL REVISION : 4.03.25 p 22 to 39
AT ORIGIN : 4.03.25 p 22 p 28
AT DESTINATION : 4.03.25 p 36 p 37
LATITUDE CROSSING WAYPOINT : 4.03.25 p 23
LEGS : 4.03.20 p 17
LEVEL CHANGE : 4.03.20 p 35 – 4.05.50 p 6 **p 7**
LEVEL OFF : 4.05.50 p 1

LINE SELECT KEY : 4.03.10 p 1 – 1.22.10 p 10

LOC MODE : 1.22.30 p 19 – 4.05.70 p 27

LONGITUDE CROSSING WAYPOINT : 4.03.25 p 23

LOW ACCURACY : 1.22.20 **p 7 p 8** – 4.05.70 p 2

M

MACH MODE : 1.22.30 p 65

MACH/START WPT : 4.03.25 p 41

MANAGED GUIDANCE : 4.01.10 p 2 – 4.02.30 **p 1**

MANAGED SPEED : 1.22.30 p 1 p 13

MANUAL LEG : 4.04.15 p 36 – 1.22.20 **p 18**

MANUAL NAV RADIO TUNING : 4.02.20 p 4

MAX REC ALTITUDE : 4.03.25 p 107

MCDU DATA LIST : 4.03.40

MCDU MESSAGES : 4.03.35

MCT : 1.22.30 p 59

MDA / MDH : 4.03.25 p 103

MENU (MCDU) : 4.03.25 p 2

MESSAGES (MCDU) : 4.03.35

MIN FUEL : 4.02.20 p 16

MINI GS : 1.22.30 p 66-67-68

MISSED APPROACH : 4.02.20 p 6 – 4.05.80 **p 4**

MODES SELECTOR : 4.03.10 p 2 – 1.22.10 p 17 to 23

MODE OF OPERATION : 1.22.10 p 7 to 9

N

NAV : 1.22.30 p 17-18

NAVAID PAGE : 4.03.25 p 52

NAVAID TUNING : 4.02.20 p 3-4 – 1.22.20 p 11

NAVIGATION MODES : 1.22.20 p 7

NEXT PAGE KEY : 4.03.10 p 1 – 1.22.10 p 11

NEXT WPT : 4.04.15 p 6-7

NEW DEST : 4.03.25 p 22-23 – 4.04.15 p 14-15

NEW NAVAID (PAGE) : 4.03.25 p 52

NEW WAYPOINT (PAGE) : 4.03.25 p 50

NON PRECISION APPROACH : 4.05.70 **p 21 to 28**
1.22.30 **p 54 to 56**

O

OFFSET : 4.03.25 p 22 – 4.04.15 **p 26-27**

OPEN CLB MODES : 1.22.30 **p 23-24**

OPEN DES MODE : 1.22.30 **p 32-33** – 4.05.60 p 6

OPT FLIGHT LEVEL : 4.03.25 p 107 – 4.02.20 p 15 - 1.22.20 p 23

ORIGIN / DESTINATION : 4.03.25 p 5

OPTIMIZATION : 4.02.20 p 14 to 16 – 1.22.20 p 21 to 23

OVERFLY KEY : 4.04.15 p 41 – 1.22.10 p 11

P

PERF PAGES TAKE OFF : 4.03.25 p 94-95
CLB : 4.03.25 p 96-97
CRZ : 4.03.25 p 98-99
DES : 4.03.25 p 100-101
APPR : 4.03.25 p 102-103
GO-AROUND : 4.03.25 p 104-105

PERFORMANCE FUNCTION : 4.02.20 p 14 to 22 – 1.22.20 p 21 to 28

PERFORMANCE FACTOR : 4.03.25 p 64

PHASES OF FLIGHT : 4.02.20 p 11 – 1.22.20 p 20

PLACE / BEARING / DISTANCE : 4.03.25 p 51 and 107/108

PLACE-BEARING / PLACE-BEARING : 4.03.25 p 51 and 107-108

POSITION MONITOR PAGE : 4.03.25 p 70-71

POSITION UPDATE :
AUTOMATIC 1.22.20 p 4-5-6
MANUAL 4.03.25 p 107-108 – 4.04.15 p 42

PPOS : 4.03.25 p 22 – 4.04.15 p 36

PROG PAGES : 4.03.25 p 106 to 109

PREDICTIONS : 4.02.20 p 17 to 22 – 1.22.20 p 24 to 28

PREDICTIVE GPS : 4.03.25 p 110

PREFLIGHT PHASE : **4.05.10** – 4.02.20 p 11

PRINTER : 4.03.25 p 82-83 – 1.22.46 p 1

Q

QNH : 4.03.25 p 102 – 4.04.30 p 1 to 4

R

RADIAL INTCPT : 4.04.15 p 11

RADIO NAV PAGE : 4.03.25 p 114

REPORT (ACARS/PRINT) : 1.22.45 p 6-7-8 – 1.22.46 p 1

REPORT PAGE : 4.03.25 p 112

RESERVE FUEL : 4.03.25 p 16-17

RESET (FMGC reset) : 4.06.20 p 1 to 4

RESUME HOLD PROMPT : 4.04.15 p 22

RETARD MODE : 1.22.30 p 65 – 4.05.70 p 11-12-13

REVERSION : 1.22.30 p 40a to 45

REVISION (LATERAL) : 4.03.25 p 22 to 39 – 4.04.15 p 1 to 14
VERTICAL 4.03.25 p 40 to 47 – 4.04.25 p 1 to 3 and p. 12

RMP TUNING : 4.02.20 p 4

RNP (REQUIRED NAVIGATION PERFORMANCE) : 4.03.25 p 109 – 1.22.20 **p 8**

ROUTE PAGE : 4.03.25 p 60-61 - p 39

RTA PAGE : 4.03.25 p 41 p 46 - 4.04.25 p 2 - 4.05.10 p 14

RUNWAY PAGES : 4.03.25 p 56-57

RUNWAY LENGTH : 4.03.25 p 57

RUNWAY SELECTION : 4.03.25 p 28-29

RUNWAY (RWY) MODE : 1.22.30 **p 48** – 4.05.30 p 1

S

SECONDARY FLIGHT PLAN : 4.03.25 p 116-117 – 4.04.30 **p 17-18**

SELECTED GUIDANCE : 4.01.10 p 2 – 4.02.30 p 1

SELECTED NAVAID PAGE : 4.03.25 **p 71** – 4.02.20 p 3

SELECTED SPEED : 1.22.30 p 11

SCRATCHPAD : 1.22.10 p 10-12

SLEW KEY : 4.03.10 p 1 – 1.22.10 p 11

SID : 4.03.25 **p 28-29** – 4.02.20 p 6

SINGLE MODE : 1.22.10 p 9 – 4.06.10 p 2

SOFT ALTITUDE : 4.02.30 p 5 – 4.05.50 p 1 – 1.22.30 p 36

SLAT RETRACTION SPEED (S) : 4.03.25 p 94 - p 102-104

SPEED CONSTRAINT : 4.02.20 p 13 – 4.05.10 **p 8**

SPEED MODE : 1.22.30 p 65-66 – 1.22.30 p 2

SPEED LIMIT : 4.02.20 p 12 – 4.05.10 p 7

SRS MODE : 1.22.30 **p 47** - p 57

STAR : 4.03.25 p 36-37 – 4.02.20 p 6

STATION DECLINATION : 4.03.25 p 53

STATUS PAGE : 4.03.25 p 64

STEP ALT PAGE/INSERTION : 4.03.25 p 44 - 4.05.50 p 6

STEP CLIMB/STEP DESCENT : 4.05.50 p 6 – 4.03.25 p 44 – 4.04.30 p 28

STORED NAVAIDS : 4.03.25 p 54

STORED ROUTE : 4.03.25 p 61 – 4.04.30 **p 19**

STORED RUNWAYS : 4.03.25 p 57

STORED WAYPOINTS : 4.03.25 p 51

T

TAKE OFF PERF PAGE : 4.03.25 p 94-95
PROG PAGE 4.03.25 p 106

TAKE OFF MODE : 1.22.30 p 47-48 – 4.05.30 p 1-2

TAKE OFF SHIFT : 4.03.25 **p 94-95** – 4.05.15 p 2

TAXI FUEL : 4.03.25 p 12-13

TEMPORARY F.PLN (TMPY) : 4.04.15 **p 2** – 1.22.20 p 19 – 4.03.25 p 23

THRUST CONTROL : 1.22.30 p 62 p 64-65

THRUST LEVERS : 4.03.10 p 3 – 1.22.30 p 59

THRUST REDUCTION ALTITUDE : 4.03.25 **p 94 - p 104** – 4.05.30 p 2 – 4.05.80 p 2-3

TIME CONSTRAINT : 4.04.25 p 2 – 4.04.30 p 34

TIME MARKER : 4.04.30 p 27

TIME OUT : 4.06.20 p 2-3

TMPY – TEMPORARY F.PLN : 4.03.25 p 23 – 4.04.15 **p 2** – 1.22.20 p 19

TOO STEEP PATH : 4.02.30 **p 10** – 4.05.60 p 8 – 1.22.30 p 31

TOP OF CLIMB : 4.02.20 p 17

TOP OF DESCENT : 4.02.20 p 17 – 4.02.30 p 8

TOW : 4.03.25 p 12

TO WAYPOINT : 4.03.25 p 19

TRK / HDG PRESET : 1.22.30 p 16-17 – 4.05.30 p 3 – 4.05.80 p 1

TRANS : 4.03.25 p 28-36 – 4.02.20 p 6

TRANSITION ALTITUDE : 4.03.25 p 94 p 102-103

TRIP WIND : 4.03.25 p 14

TURN POINT (T.P.) : 4.02.20 p 8 – 4.04.15 p 33-34-35 p 37

U

UNFREEZE : 4.03.25 p 71

UPDATE AT : 4.03.25 p 107-108 – 4.04.15 p 42

UPLINK MESSAGE (ACARS) : 4.04.40 p 2 p 4 p 7

V

VAPP : 1.22.30 **p 66-67-68** – 4.03.25 p 102-103

V/DEV : 4.02.20 **p 22** – 4.03.25 p 107 – 1.22.30 p 27 - p 56

« V » SPEEDS : 4.03.25 p 94 p 102 p 104

VERTICAL FUNCTIONS : **4.04.25 p 1**

VERTICAL SPEED – FLIGHT PATH ANGLE : 1.22.30 **p 37-38** – 4.02.30 p 3

VIA : 4.04.15 p 3

VIA (APPROACH VIA) : 4.03.25 **p 36-37** 4.02.20 p 6

VISUAL APPROACH : 4.05.70 p 29-30

VOR TUNING : 1.22.20 p 11-12 – 4.02.20 p 3

W

WAYPOINT INSERTION : 4.04.15 p 6

WIND ENTRIES : 4.03.25 p 8 to 11
4.04.25 p 4 to 11

WIND FORECAST : 4.02.20 p 15

WIND PAGES : 4.03.25 p 8 to 11
* CLIMB 4.03.25 p 8-9
* CRUISE 4.03.25 p 10
* DESCENT 4.03.25 p 11

Z

ZFWCG/ZFW : 4.03.25 p 12 – 4.05.10 p 16-17

1. GENERAL INDEX

- The following index lists the main terms used in the FMGS chapter.

A

ABNORMAL PROCEDURES : 4.06.20

ABEAM INTCP : 4.04.15 p 12

ACCELERATION ALTITUDE : 4.03.28 **p 84** – 4.05.30 p 3 – 4.05.80 p 2-3

ACCURACY (HIGH-LOW) : 4.02.20 p 1 – 4.05.50 p 2 – 4.05.70 p 2 – 1.22.20 **p 7-8-9**

ACTIVE FLIGHT PLAN : 4.03.28 p **17 to 21** – 1.22.20 p 15-20

ACTIVE LEG : 4.03.28 p 18

ACT MODE : 4.03.28 p 85-87-89

AIRCRAFT POSITION : 4.03.28 p 64 – 1.22.20 p **2 to 6**

AIRCRAFT STATUS PAGE : 4.03.28 p 59

AIRPORT KEY : 1.22.10 p 11

AIRWAY INSERTION : 4.04.18 p 3

AIRWAYS PAGE : 4.03.28 p 24

ALIGNMENT OF IRS : 4.05.10 p 4 – 1.22.20 p **14** – 4.03.28 p 5

ALONG TRACK OFFSET : 4.04.18 p 6

ALPHANUMERIC KEYS : 4.03.10 p 1 – 1.22.10 p 11

ALTERNATE SELECTION / REVISION : 4.03.28 p 37 – 4.04.18 **p 22**

ALTERNATE ROUTE : 4.03.28 **p 38** – 4.03.28 p 3

ALT ACQ MODE : 1.22.30 p 33

ALTITUDE CONSTRAINT
CLIMB : 4.02.20 p **13** – 1.22.30 p **21** – 4.05.40 p 5
DESCENT : 1.22.30 p 20 – 4.05.60 **p 4**

ALTITUDE HOLD MODE : 1.22.30 p 35

ANNUNCIATORS (FMA) : 1.22.30 p **69 to 76** – 4.02.30 p 13

AOC FUNCTIONS : 1.22.45 – 4.04.40 p 1 to 8

AOC page description : 4.03.28 p 73

AP / FD MODES
- TAKEOFF : 1.22.30 p 47-48
- CLIMB : 1.22.30 p 20 to 24 – 4.02.30 p 4-5
- CRUISE : 1.22.30 p 35-36 – 4.02.30 p 5
- DESCENT : 1.22.30 p 25 to 33 – 4.02.30 p 6 to 11
- APPROACH : 1.22.30 p 49 to 56 – 4.02.30 p 12
- LANDING : 1.22.30 p 52
- GO AROUND : 1.22.30 p 57

APPROACH PUSHBUTTON : 4.03.10 p 2 – 1.22.10 **p 22**

APPROACH PHASE (ACTIVATE) : 4.03.28 p 85-87-89

APPROACH PROCEDURE : 4.05.70 p 1 to 30
- ILS PROCEDURE 4.05.70 p 3 to 9
- AUTOLAND 4.05.70 p 4 – p 10 to 13
- NON PRECISION 4.05.70 p 21 to 28
- BACK COURSE LOCALIZER 4.05.70 p 20
- GPS 4.05.70 p 22
- CIRCLING 4.05.70 p 29
- VISUAL 4.05.70 p 29-30

APPROACH TRANS : 4.03.28 p 26 – 1.22.20 **p 16 to 18**

APPROACH VIAS : 4.03.28 **p 35** – 1.22.20 p 16 to 18

ARRIVAL page : 4.03.28 p 34

ARROWS key : 1.22.10 p 11

AUTOLAND WARNING : 4.05.70 p 15 – 1.22.30 p 53

AUTOPILOT : 1.22.30 p 7-8

AUTOTHRUST (A/THR) : 4.03.10 p 3 – 1.22.30 **p 58 to 68**

AUTOTHRUST MODES : 1.22.30 p 64-65

AUTOTUNING : 4.02.20 p 3 – 1.22.20 **p 11 to 13**

B

BARO SETTING : 4.04.30 p 1 to 3

BACK COURSE LOCALIZER APPROACH : 4.05.70 p 20

BEARING AND DISTANCE TO WPT : 4.03.28 p 95-97

BFO (BEAT FREQUENCY OSCILLATOR) : 4.03.28 p 103-104

BLOCK (FUEL) : 4.03.28 **p 13-14** – 4.05.10 p 16

BRACKETS : 1.22.10 p 14

BRIGHTNESS CONTROL : 4.03.10 p 1 – 1.22.10 p 10

C

CG : 4.03.28 p 14-15

CG (ZFWCG) : 4.03.28 p 14

CIRCLING APPROACH : 4.05.70 p 29

CITY PAIR : 4.03.28 **p 5** – 4.02.20 p 7

CLEAR KEY : 4.03.10 p **1** – 4.04.30 **p 5** – 1.22.10 p 10

CLEARING FUNCTION : 4.04.30 p 5

CL DETENT : 4.03.10 p 3 – 1.22.30 p **59**

CLIMB MODE : 4.02.30 p 4 – 1.22.30 **p 20 to 22**

CLIMB PHASE : 4.05.40 – 4.02.20 p 11

CLIMB SPD LIMIT : 4.03.28 p 39-40 – 4.05.10 **p 7**

CLOSEST AIRPORTS PAGE : 4.03.28 p 111-112 – 4.04.28 p 24-25

COMMON MODES : 1.22.30 p 46 to 68

COMPANY ROUTE : 4.03.28 p 3 – 4.02.20 **p 6 p 7** – 4.05.10 p 3

CONFIRM APPR PROMPT : 4.03.28 p 85-87-89

CONFIRM UPDATE AT : 4.03.28 p 95-96-97

CONSTANT MACH SEGMENT : 4.03.28 p 117-118 – 4.04.28 p 12-13

CONSTRAINT : 4.02.20 p 13 – 1.22.30 p 21 – 4.05.40 p 5 – 4.05.60 p 4

COPYING ACTIVE FLIGHT PLAN TO SECONDARY : 4.03.28 p 105-106 – 4.04.30 p 17

COST INDEX : 4.03.28 p 85-87-89 – 4.02.20 **p 16** – 1.22.20 p 24

COST INDEX LRC : 4.05.50 p 14

CROSS TALK : 1.22.10 p 7

CROSS LOAD : 4.06.30 p 1 - p 2

CRUISE LEVEL : 4.03.28 **p 95** – 4.02.30 p 5 – 4.05.50 p 1

CRUISE ALTITUDE CHANGE : 4.05.50 **p 7** – 4.05.50 p 1

D

DATABASE : 1.22.10 p 2

DATABASE VALIDITY : 1.22.10 p 2

DATA ENTRY : 4.02.20 p 10

DATA PAGES : 4.03.28 p 45 to 58

DEFAULT DATA : ZFWCG : 4.03.28 p 13 HOLD 4.04.18 p 9

DELETE ALL : 4.03.28 **p 59-60**

DEPARTURE PAGE : 4.03.28 p 25

DES CABIN RATE : 4.03.28 p 87-88

DES MODE : 4.05.60 p 1 p 2 – 4.02.30 **p 6 to 11** – 1.22.30 p 25 to 31

DESCENT PROFILE : 4.02.30 p 6-7

DESELECT : 4.03.28 p 65 – 4.05.10 p 2

DH : 4.03.28 p 92

DIR TO : 4.03.28 p 30 – 4.04.18 **p 27**

DISCONTINUITY IN F.PLN : 4.04.30 **p 5** – 1.22.20 p 17 – 4.04.18 **p 30**

DIST TO DEST : 4.03.28 p 18

DIVERSION
NEW DESTINATION : 4.04.18 p 8 – 4.03.28 p 21
ALTERNATE : 4.03.28 p 37 – 4.04.18 p 22

DONE PHASE : 4.02.20 p 11

DOWNLINK MESSAGE : 4.03.28 p 73-74 – 1.22.45 **p 2**

DUAL MODE : 1.22.10 p 7

DUPLICATE : 4.03.28 p 63

E

ECON CRUISE : 4.03.28 p 87 – 1.22.20 p 23 – 4.02.20 **p 14**

ECON DESCENT : 4.03.28 p 89 – 1.22.20 p 22

ECON MODE : 4.03.28 p 85-87-89 – 4.02.20 **p 14**

EFIS : 1.22.10 p 4

EFOB : 4.03.28 p 15 – 4.03.28 p 18-19

EMERGENCY RETURN : 4.05.40 p 8

END WPT : 4.03.28 p 41

ENERGY CIRCLE : 1.22.20 p 27 – 4.02.20 **p 18**

ENGINE OUT : 4.04.30 **p 10 to 16**
TO : 4.04.30 p 12 to 14
CLIMB : 4.04.30 p 14
CRUISE : 4.04.30 p 15
DESCENT : 4.04.30 p 16
APPROACH : 4.04.30 p 16
GO AROUND : 4.04.30 p 16

EQUI-TIME POINT : 4.03.28 p 113-114 – 4.04.30 p 22-33

E.T.T. : 4.05.10 p 14

EXIT (IMM EXIT FROM ACTIVE HOLD) : 4.04.18 **p 15**

EXPEDITE ◁ : 4.05.40 p 7 – 1.22.30 **p 39 – 40**

F

FAC : 1.22.40 p 4

FAIL ANNUNCIATOR : 1.22.10 **p 11**

FAILURES AND ASSOCIATED PROCEDURES (DURING CAT II and CAT III) : 4.05.70 p 17-18-19

FAST ALIGNMENT : 4.05.10 p 4 – 1.22.20 p 14

FIGURE OF MERIT : 4.03.28 p 50

FLAP RETRACTION SPEED (F) : 4.03.28 p 83 – p 91

FLEX TO TEMP : 4.03.28 p 83

FLIGHT DIRECTOR : 1.22.30 p 3

FLIGHT GUIDANCE PRINCIPLES : 4.02.30

FLIGHT MANAGEMENT PRINCIPLES : 4.02.20 – 1.22.20

FLIGHT NUMBER : 4.03.28 p 4

FLIGHT OPTIMIZATION : 4.02.20 p 14 p 15 p 16 – 1.22.20 **p 21 p 22 p 23**

FLIGHT PHASES : 4.02.20 p 11

FLIGHT PATH ANGLE MODE : 1.22.30 p 37 p 38

FLIGHT PLAN CONSTRUCTION : 4.02.20 p 6 to p 9 – 4.05.10 p 3 p 4

FMA ANNUNCIATION : 1.22.30 **p 69 to 76** – 4.02.30 p 13

FMA MESSAGES : 1.22.30 p 76

FMGS ABNORMALITIES : 4.06.20 p 1 to 7

FMS DEGRADED MODE : 4.06.20 p 3a

F-PLN KEY : 4.03.10 p 1 – 1.22.10 p 10

F-PLN DISCONTINUITY : 4.04.30 p 5 – 1.22.20 p 17 – 4.04.18 **p 30**

F-PLN PAGE : 4.03.28 p 17 to 20

FREEZE PROMPT : 4.03.28 p 65

FROM WAYPOINT : 4.03.28 p 18

FUEL ON BOARD (FOB) : 4.03.28 p 16

FUEL PLANNING : 4.03.28 p 14

FUEL PREDICTION : 4.03.28 p 15-16 – p 20

FUEL TAXI : 4.03.28 p 13-14

FUEL PRED KEY AND PAGE : 4.03.28 **p 15-16** – 4.03.10 p 1

FUEL SENSORS : 4.03.28 p 16

G

GLIDE : 4.05.70 p 8A

GO AROUND MODE : 1.22.30 p 57

GO AROUND PROCEDURE : 4.05.80 p 1 to 5

GO AROUND PERF page : 4.03.28 p 93-94

GO AROUND TRACK : 1.22.30 p 57

GPS : 1.22.20 p 2

GPS approach : 4.05.70 p 22

GPS MONITOR PAGE : 4.03.28 p 69

GREEN DOT SPEED : 4.03.28 p 83-84 – p 93-94

GROSS WEIGHT : 4.03.28 p 15 – 4.05.10 **p 16-17**

GROUND SPEED MINI : 1.22.30 p 66-67-68

GUIDANCE (MANAGED, SELECTED) : 4.02.30 **p 1** – 1.22.10 p 2 – 1.22.30 p 1

H

HDG MODE : 1.22.30 **p 16** – 4.02.30 p 2

HDG-TRK PRESET : 4.05.10 p 23 – 4.05.80 p 1 – 1.22.30 p 16

HIGH ACCURACY : 4.02.20 **p 2** – 1.22.20 p 8

HOLD PAGES : 4.03.28 p 27 to 29

HOLDING PATTERN : 4.04.18 p 9 to 19

HOLD PROMPT : 4.03.28 p 27

I

IDLE PERF : 4.03.28 p 59

ILS APPROACH : 4.05.70 p 3 to 9

ILS IDENT / FREQ : 4.03.28 p 103

ILS TUNING : 4.03.28 p 103 – 4.05.70 **p 4 p 7**

IMM EXIT : 4.04.18 **p 15**

INDEPENDENT OPERATION : 1.22.10 p 8 – 4.06.10 **p 1**

INIT PAGE (INITIALIZATION) : 4.03.28 p 3 to 5

INTERFACES : 4.03.10 p 1 to 5

IRS ALIGNMENT : 4.03.28 p 5 – 4.05.10 p 4 – 1.22.20 **p 14**

IRS INIT PAGE : 4.03.28 p 7

IRS MONITOR PAGE : 4.03.28 p 67

IRS PAGES : 4.03.28 p 68

IRS POSITION, MIX IRS : 1.22.20 p 2

K

KEY, ALPHANUMERIC KEYS : 4.03.10 p 1 – 1.22.10 p 10 p 11

L

LAND MODE : 4.05.70 p 4 – 1.22.30 p 52

LANDING CATEGORIES : 4.05.70 p 14

LANDING CONF. : 4.03.28 p 92

LATERAL F.PLN : 4.02.20 p 5 p 6 – 4.05.10 p 5 p 6

LATERAL MODES : 1.22.30 p 14 **to 19**

LATERAL REVISION : 4.03.28 p 21 to 38

AT ORIGIN : 4.03.28 p 21 p 26

AT DESTINATION : 4.03.28 p 34-36

LATITUDE CROSSING WAYPOINT : 4.03.28 p 22

LEGS : 4.03.20 p 17

LEVEL CHANGE : 4.03.20 p 35 – 4.05.50 p 6 **p 7**

LEVEL OFF : 4.05.50 p 1

LINE SELECT KEY : 4.03.10 p 1 – 1.22.10 p 10

LOC MODE : 1.22.30 p 19 – 4.05.70 p 27

LONGITUDE CROSSING WAYPOINT : 4.03.28 p 22

LOW ACCURACY : 1.22.20 **p 7 p 8** – 4.05.70 p 2

M

MACH MODE : 1.22.30 p 65

MACH/START WPT : 4.03.28 p 40

MANAGED GUIDANCE : 4.01.10 p 2 – 4.02.30 **p 1**

MANAGED SPEED : 1.22.30 p 1 p 13

MANUAL LEG : 4.04.18 p 30 – 1.22.20 **p 18**

MANUAL NAV RADIO TUNING : 4.02.20 p 4

MAX REC ALTITUDE : 4.03.28 p 96

MCDU DATA LIST : 4.03.40

MCDU MESSAGES : 4.03.38

MCT : 1.22.30 p 59

MDA / MDH : 4.03.28 p 92

MENU (MCDU) : 4.03.28 p 2

MESSAGES (MCDU) : 4.03.38

MIN DEST FOB : 4.03.28 p 14a, p 16
4.05.10 p 17a
4.05.50 p 4
4.04.30 p 10
4.04.18 p 14

MINI GS : 1.22.30 p 66-67-68

MISSED APPROACH : 4.02.20 p 6 – 4.05.80 **p 4**

MODES SELECTOR : 4.03.10 p 2 – 1.22.10 p 17 to 23

MODE OF OPERATION : 1.22.10 p 7 to 9

N

NAV : 1.22.30 p 17-18

NAVAID PAGE : 4.03.28 p 49

NAVAID TUNING : 4.02.20 p 3-4 – 1.22.20 p 11

NAVIGATION MODES : 1.22.20 p 7

NEXT PAGE KEY : 4.03.10 p 1 – 1.22.10 p 11

NEXT WPT : 4.04.18 p 8-9

NEW DEST : 4.03.28 p 21-22 – 4.04.18 p 8-9

NEW NAVAID (PAGE) : 4.03.28 p 49

NEW WAYPOINT (PAGE) : 4.03.28 p 47

NON PRECISION APPROACH : 4.05.70 **p 21 to 28**
1.22.30 **p 54 to 56**

O

OFFSET : 4.03.28 p 21 – 4.04.18 **p 20-21**

OPEN CLB MODES : 1.22.30 **p 23-24**

OPEN DES MODE : 1.22.30 **p 32-33** – 4.05.60 p 6

OPT FLIGHT LEVEL : 4.03.28 p 96 – 4.02.20 p 15 - 1.22.20 p 23

ORIGIN / DESTINATION : 4.03.28 p 5

OPTIMIZATION : 4.02.20 p 14 to 16 – 1.22.20 p 21 to 23

OVERFLY KEY : 4.04.18 p 35 – 1.22.10 p 11

P

PERF PAGES TAKE OFF : 4.03.28 p 83-84
CLB : 4.03.28 p 85-86
CRZ : 4.03.28 p 87-88
DES : 4.03.28 p 89-90
APPR : 4.03.28 p 91-92
GO-AROUND : 4.03.28 p 93-94

PERFORMANCE FUNCTION : 4.02.20 p 14 to 22 – 1.22.20 p 21 to 28

PERFORMANCE FACTOR : 4.03.28 p 59

PHASES OF FLIGHT : 4.02.20 p 11 – 1.22.20 p 20

PILOT NAVAIDS : 4.03.28 p 49-51

PILOT ROUTE : 4.03.28 p 56-57

PILOT RUNWAYS : 4.03.28 p 53-54

PILOT WAYPOINTS : 4.03.28 p 47-48

PLACE / BEARING / DISTANCE : 4.03.28 p 48 and 96-97

PLACE-BEARING / PLACE-BEARING : 4.03.28 p 48 and 96-97

POSITION MONITOR PAGE : 4.03.28 p 64-65

POSITION UPDATE :
AUTOMATIC 1.22.20 p 4-5-6
MANUAL 4.03.28 p 96-97 – 4.04.18 p 36

PPOS : 4.03.28 p 21 – 4.04.18 p 30

PROG PAGES : 4.03.28 p 95 to 98

PREDICTIONS : 4.02.20 p 17 to 22 – 1.22.20 p 24 to 28

PREDICTIVE GPS : 4.03.28 p 99

PREFLIGHT PHASE : **4.05.10** – 4.02.20 p 11

PRINT FUNCTION : 4.03.28 p 71-72 – 1.22.46 p 1 – 4.04.50

Q

QNH : 4.03.28 p 91 – 4.04.30 p 1 to 4

R

RADIAL FIX INFO PAGE : 4.03.28 p 109-110 – 4.04.18 p 43-44-45

RADIO NAV PAGE : 4.03.28 p 103

REPORT (ACARS/PRINT) : 1.22.45 p 6-7-8 – 1.22.46 p 1

REPORT PAGE : 4.03.28 p 101

REQUIRED TIME ARRIVAL PAGE (RTA) : 4.03.28 p 115-116 – 4.04.28 p 2-2A – 4.04.30 p 34

RESERVE FUEL : 4.03.28 p 15-16

RESET (FMGC reset) : 4.06.20 p 1 to 4

RESUME HOLD PROMPT : 4.04.18 p 16

RETARD MODE : 1.22.30 p 65 – 4.05.70 p 11-12-13

REVERSION : 1.22.30 p 40a to 45

REVISION (LATERAL) : 4.03.28 p 21 to 38 – 4.04.18 p 1 to 8
VERTICAL 4.03.28 p 39 to 46 – 4.04.28 p 1 to 3 and p. 8

RMP TUNING : 4.02.20 p 4

RNP (REQUIRED NAVIGATION PERFORMANCE) : 4.03.28 p 98 – 1.22.20 **p 8**

ROUTE PAGE : 4.03.28 p 56-57 - p 38

RUNWAY PAGES : 4.03.28 p 53-54

RUNWAY LENGTH : 4.03.28 p 54

RUNWAY SELECTION : 4.03.28 p 25-26

RUNWAY (RWY) MODE : 1.22.30 **p 48** – 4.05.30 p 1

S

SECONDARY FLIGHT PLAN : 4.03.28 p 105-106 – 4.04.30 **p 17-18**

SELECTED GUIDANCE : 4.01.10 p 2 – 4.02.30 p 1

SELECTED NAVAID PAGE : 4.03.28 **p 65** – 4.02.20 p 3

SELECTED SPEED : 1.22.30 p 11

SCRATCHPAD : 1.22.10 p 10-12

SLEW KEY : 4.03.10 p 1 – 1.22.10 p 11

SID : 4.03.28 **p 25-26** – 4.02.20 p 6

SINGLE MODE : 1.22.10 p 9 – 4.06.10 p 2

SOFT ALTITUDE : 4.02.30 p 5 – 4.05.50 p 1 – 1.22.30 p 36

SLAT RETRACTION SPEED (S) : 4.03.28 p 83 - p 91-93

SPEED CONSTRAINT : 4.02.20 p 13 – 4.05.10 **p 8**

SPEED MODE : 1.22.30 p 65-66 – 1.22.30 p 2

SPEED LIMIT : 4.02.20 p 12 – 4.05.10 p 7

SRS MODE : 1.22.30 **p 47** - p 57

STAR : 4.03.28 p 34-35 – 4.02.20 p 6

STATION DECLINATION : 4.03.28 p 49

STATUS PAGE : 4.03.28 p 59

STEP ALTS : 4.03.28 p 43 - 4.05.50 p 6

STEP CLIMB/STEP DESCENT : 4.05.50 p 6 – 4.03.28 p 43 – 4.04.30 p 28

T

TAKE OFF PERF PAGE : 4.03.28 p 83-84
PROG PAGE 4.03.28 p 95

TAKE OFF MODE : 1.22.30 p 47-48 – 4.05.30 p 1-2

TAKE OFF SHIFT : 4.03.28 **p 83-84** – 4.05.15 p 2

TAXI FUEL : 4.03.28 p 13-14

THRUST CONTROL : 1.22.30 p 62 p 64-65

THRUST LEVERS : 4.03.10 p 3 – 1.22.30 p 59

THRUST REDUCTION ALTITUDE : 4.03.28 **p 83 - p 93** – 4.05.30 p 2 – 4.05.80 p 2-3

TIME MARKER : 4.04.30 p 27

TIME OUT : 4.06.20 p 4

TMPY – TEMPORARY F.PLN : 4.03.28 p 22 – 4.04.18 **p 2** – 1.22.20 p 19

TOO STEEP PATH : 4.02.30 **p 10** – 4.05.60 p 8 – 1.22.30 p 31

TOP OF CLIMB : 4.02.20 p 17

TOP OF DESCENT : 4.02.20 p 17 – 4.02.30 p 8

TOW : 4.03.28 p 13

TO WAYPOINT : 4.03.28 p 18

TRK / HDG PRESET : 1.22.30 p 16-17 – 4.05.30 p 3 – 4.05.80 p 1

TRANSITION (TRANS) : 4.03.28 p 25-34 – 4.02.20 p 6

TRANS ALT : 4.03.28 p 83 – 4.05.10 p 19

TRANS FL : 4.03.28 p 91-92 – 4.05.50 p 12

TURN POINT (T/P) : 4.02.20 p 8 – 4.04.18 p 30-32 p 35

U

UNFREEZE : 4.03.28 p 65

UPDATE AT : 4.03.28 p 96-97 – 4.04.18 p 36

UPLINK MESSAGE (ACARS) : 4.04.40 p 2 p 4 p 7

V

VAPP : 1.22.30 **p 66-67-68** – 4.03.28 p 91-92

V/DEV : 4.02.20 **p 22** – 4.03.28 p 96 – 1.22.30 p 27 - p 56

« V » SPEEDS : 4.03.28 p 83 p 91 p 93

VERTICAL FUNCTIONS : **4.04.28 p 1**

VERTICAL SPEED – FLIGHT PATH ANGLE : 1.22.30 **p 37-38** – 4.02.30 p 3

VIA : 4.04.18 p 3

VIA (APPROACH VIA) : 4.03.28 **p 34-35** 4.02.20 p 6

VISUAL APPROACH : 4.05.70 p 29-30

VOR TUNING : 1.22.20 p 11-12 – 4.02.20 p 3

W

WAYPOINT INSERTION : 4.04.18 p 4

WIND ENTRIES : 4.03.28 p 8 to 12
4.04.28 p 4 to 12

WIND FORECAST : 4.02.20 p 15

WIND PAGES : 4.03.28 p 8 to 12
* CLIMB 4.03.28 p 8-9
* CRUISE 4.03.28 p 10
* DESCENT 4.03.28 p 11

Z

ZFW/ZFWCG : 4.03.28 p 13 – 4.05.10 p 16-17
4.03.28 P 15-16