

 virgin atlantic A340-600 <i>Flight Crew Operating Manual</i>	MULTI PHASE RELATED PROCEDURES		4.04.10	P 1
	LATERAL FUNCTIONS		SEQ 001	REV 07

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 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 crew selects these functions by pressing the left keys 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 updates the FM position. It does not use a temporary flight plan, but the pilot 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.
- 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).

FFC5-04-04.10-002-A001AA

FROM TMPY		AF 5612	
	UTC	SPD	ALT
1L	PARMA	1019	-----
2L	UA 14		103NM
3L	FRZ	-----	-----
4L	UA 14	TRK 192	99
5L	BOL	-----	-----
6L	UA 14		91
	PEMAR	-----	-----
	UA 14		69
	TEA	-----	-----
← ERASE		INSERT★	

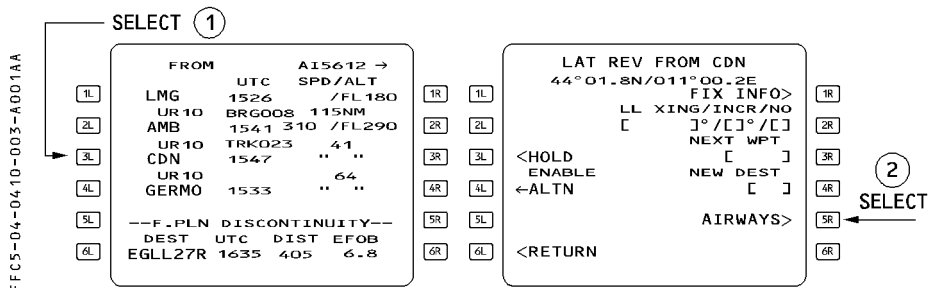
Press 6L to erase a TMPY F-PLN (the crew does not want to activate the lateral revision)

Press 6R to insert the TMPY F-PLN into the active F-PLN

Temporary data are displayed in yellow (ND and MCDU). Once inserted they become active and are displayed in green.

INSERTING AN AIRWAY WITH "VIA"

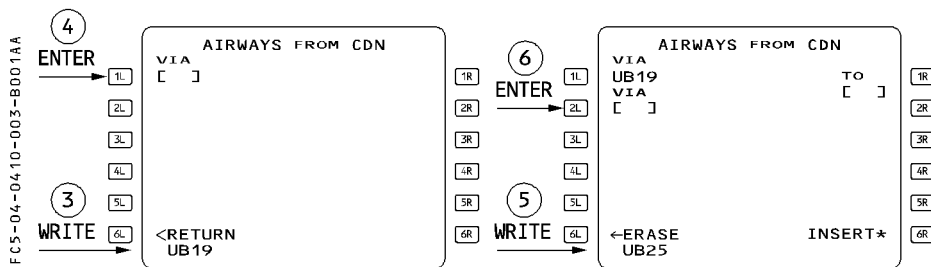
The pilot can insert into the active flight plan, up to 5 successive airway segments going from a revised waypoint or ending at a given waypoint of the flight plan.



- SELECT the revised waypoint (here CDN).
- PRESS [5R] to select the airways function.

THE PILOT WISHES TO INSERT SUCCESSIVE AIRWAY SEGMENT FROM A WAYPOINT

e.g. from CDN - Airways UB19 – Airways UB25 – Ending point AAA.

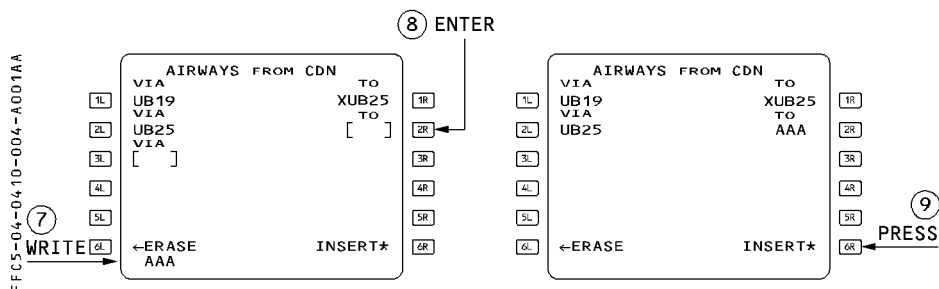


- WRITE the first airway in the scratchpad (here UB19).
- PRESS [1L] to insert into the VIA field.
- WRITE the second airway in the scratchpad (here UB25)
- PRESS [2L] to insert into the VIA field.

The system determines automatically 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 neither intersection, the system displays NO INTERSECTION FOUND in the scratchpad.

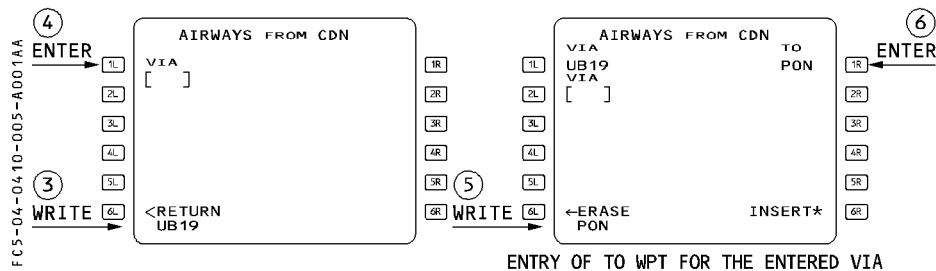
Once the pilot has entered the required airways (up to 5), he must enter the ending point of the last selected airways :



- 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 and the system selects the first one in the database.

THE PILOT WISHES TO INSERT ONE AIRWAY SEGMENT TO AN ENDING WAYPOINT



- WRITE the airway ident in the scratchpad (here UB19).
- PRESS [1L] to insert into the VIA field.
- WRITE the ending waypoint in the scratchpad (here PON).
- PRESS [1R] to insert 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 and the system selects the first one in the database.

FLIGHT PLAN INSERTION

The flight crew inserts the flight plan either directly from the AIRWAYS page or from the TMPY F-PLN page. In both cases :

- PRESS [6R] to insert the temporary flight plan. Clear the flight plan discontinuity as necessary.

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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 at “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). 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 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 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.*

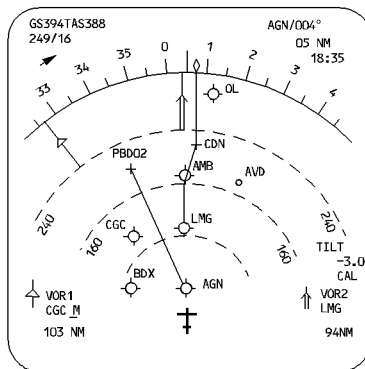
WAYPOINT INSERTED DIRECTLY IN THE FLIGHT PLAN

② SELECT

1L	FROM	UTC	IT5612	1R
2L	TOU	1013	SPD/ALT	2R
3L	LMG2D	BRG 308	23NM	3R
4L	AGN	1020	.78/FL290	4R
5L	UR10	TRK004	116	5R
6L	LMG	1035	.78/FL290	6R
	UR10		97	
	AMB	1051	" / "	
			40	
	CDN	1056	" / "	
	DEST	UTC	DIST EFOB	
	LFPG1D	1134	352	8.4
	LMG/330/135			↑↓

① WRITE

1L	FROM	UTC	IT5612	1R
2L	TOU	1013	SPD/ALT	2R
3L	LMG2D	BRG308	23NM	3R
4L	AGN	1022	.80/FL290	4R
5L	DIRECT	TRK346	237	5R
6L	PBD02	1050	.80/FL290	6R
	---F-PLN DISCONTINUITY---			
	LMG	1101	" "	
	DEST	UTC	DIST EFOB	
	LFPG1D	1154	554	7.2
				↑↓



CORRESPONDING ND

- 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.

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ALONG TRACK WAYPOINT INSERTION

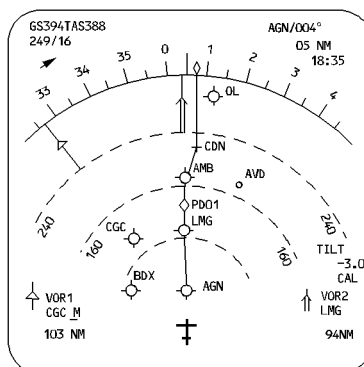
The pilot can enter in the F-PLN page or in the STEP ALTS page an along track waypoint defined as a place/distance waypoint.

② SELECT

	FROM	UTC	AI 101	SPD/ALT	
1L	TOU	1013		/FL220	1R
2L	LMG2D	BRG 308	23NM		2R
3L	AGN	1020	.78/FL290		3R
4L	UR10	TRK004	116		4R
5L	LMG	1035	.78/FL290		5R
6L	UR10		97		6R
	AMB	1051	"/"		
	UR10	TRK015	40		
	CDN	1056	"/"		
	DEST	UTC	DIST	EFOB	
	LFPG1D	1134	352	8.4	
	AMB/-040			↑↓	

① WRITE

	FROM	UTC	AI 101	SPD/ALT	
1L	TOU	1013		/FL220	1R
2L	LMG2D	BRG308	23NM		2R
3L	AGN	1022	.80/FL290		3R
4L	UR10	TRK004	116		4R
5L	LMG	1035	.78/FL290		5R
6L	UR10		57		6R
	PDO1	1045	"/"		
	UR10		40		
	AMB	1051	"/"		
	DEST	UTC	DIST	EFOB	
	LFPG1D	1154	554	7.2	
				↑↓	



CORRESPONDING ND

– 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).

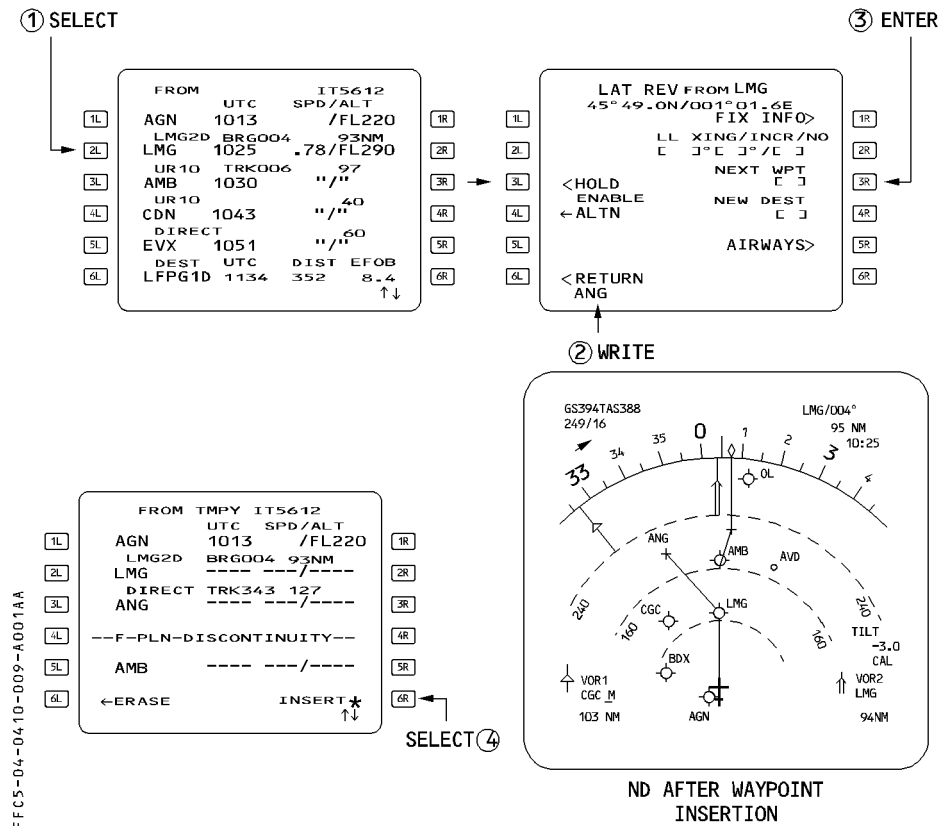
– PRESS the appropriate key adjacent to the place identifier. The system positions the waypoint automatically in the flight plan.

This operation does not create any discontinuity.

The system does not accept an along track waypoint entered at the FROM waypoint.

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WAYPOINT INSERTED THROUGH THE USE OF "NEXT WAYPOINT"

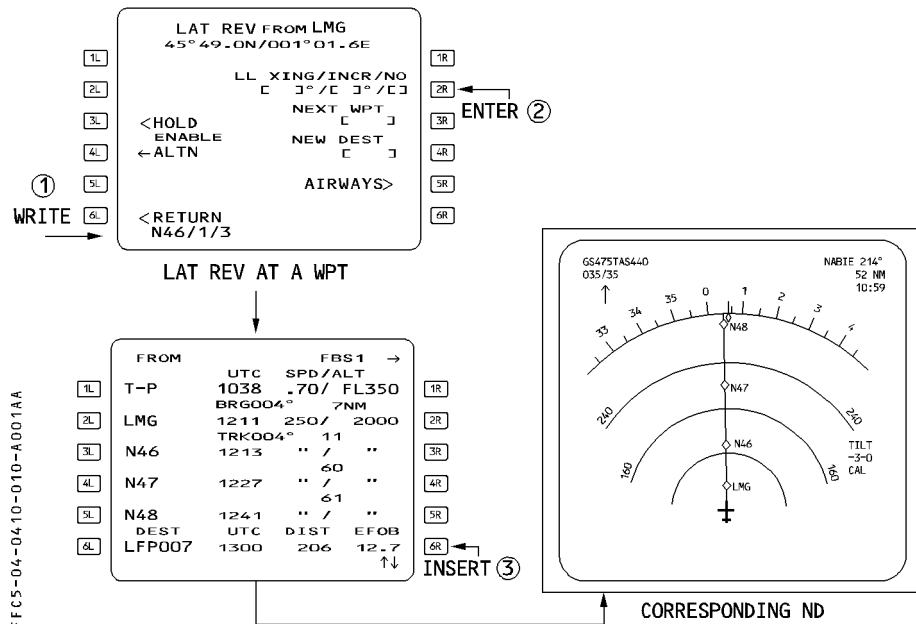


- SELECT the lateral revision (LAT REV) function at an appropriate waypoint.
- WRITE the waypoint identifier, or LAT/LONG, or Place/Bearing/Distance, or Place-Bearing / Place-Bearing into the scratchpad.
- ENTER it in the brackets under NEXT WPT (next waypoint).
- INSERT the temporary flight plan by depressing the [6R] key
- CLEAR the F-PLN discontinuity as appropriate.

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 get 3 points, every degree from latitude N46 : he enters N46/1/3).

- PRESS [2R] to insert 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

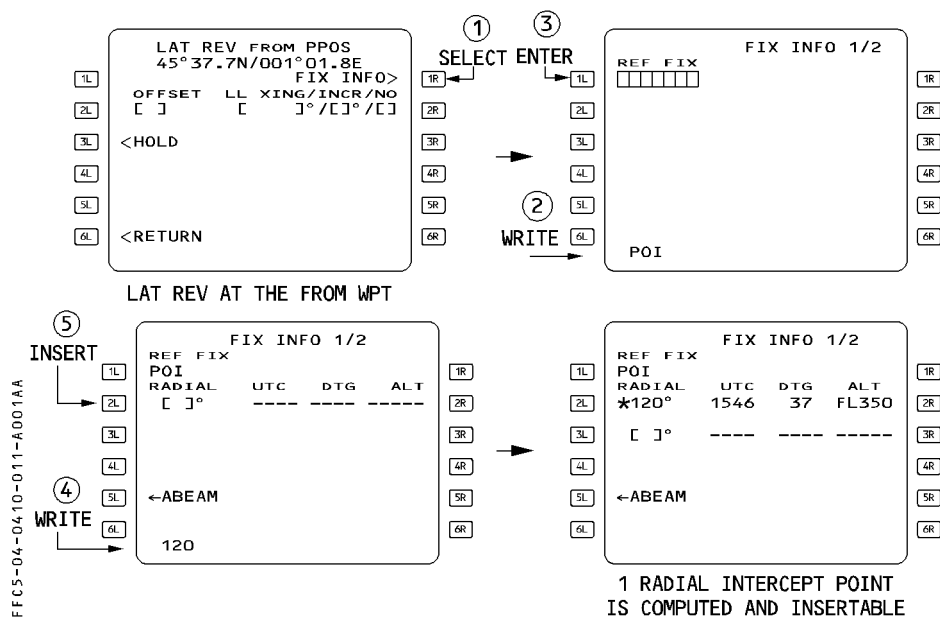
When using FIX INFO function, the pilot defines waypoint intersections of the flight plan with radials associated to a fix.

When the pilot inserts the intersection point, the system identifies automatically 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 OF A RADIAL INTERCEPT WAYPOINT

The pilot accesses the radial intercept function from the lateral revision page at origin or at the “from” waypoint.



- WRITE the reference fix identifier into the scratchpad. It may be any database or pilot defined fix (here POI).
- PRESS key [1L].
- WRITE the radial into the scratchpad (here 120°).

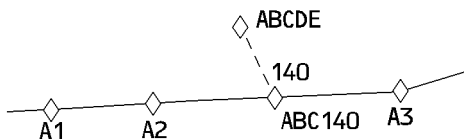
- PRESS key [2L] for the first radial.

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 :

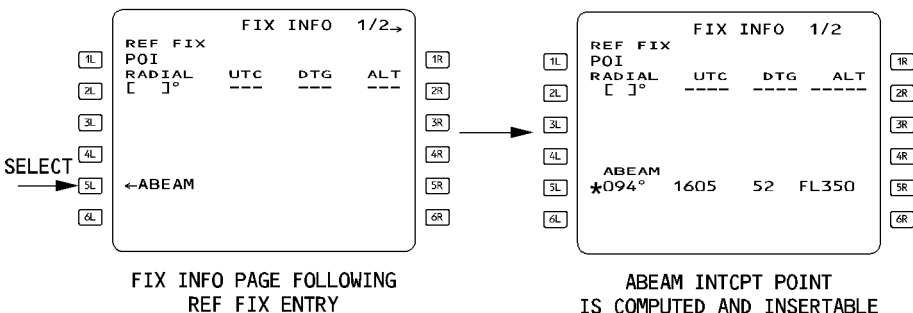
The system assigns automatically its ident as the 3 first characters of the reference fix ident, followed by the radial. (Example : ABC 140).



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INSERTING AN ABEAM INTERCEPT WAYPOINT

The pilot accesses this function from the lateral revision page at origin or at the FROM waypoint.



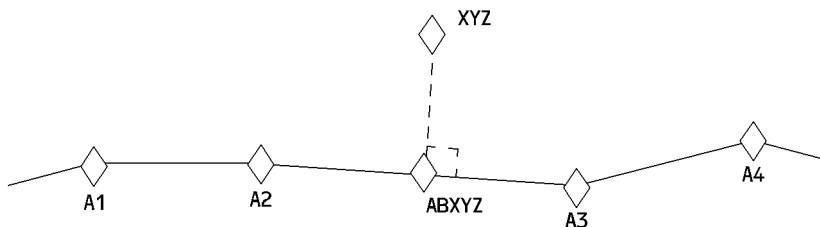
FFCS-04-04.10-012-B001AA

- WRITE the reference fix identifier into the scratchpad (here POI).

- PRESS key [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.

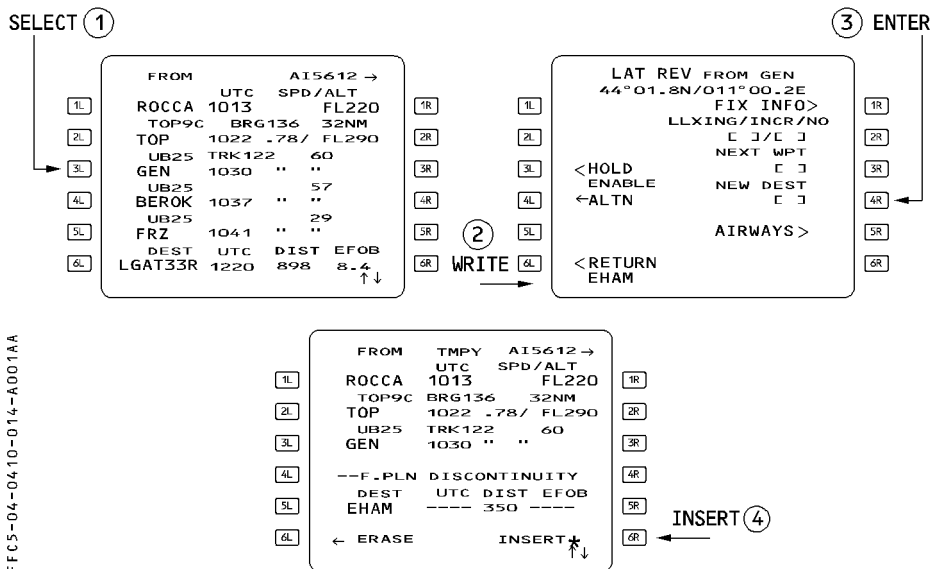
- SELECT key [5L] to insert the abeam intercept waypoint into the flight plan : the system assigns automatically its identifier as AB, followed by the 5 first characters of the reference fix identifier (Example ABXYZ)



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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.

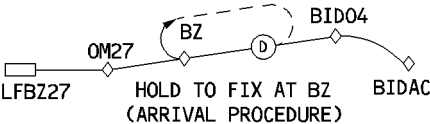
HOLD TO FIX (HF)

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.

FFC5-04-0410-015-A001AA

FROM		UTC	AI 140 →		
1L	BID04	1402	SPD/ALT	1R	
	C274	BRG275°	/ 4500		
2L	(DECEL)	1403	250/ 3500	2R	
	C274	TRK274°	7 2NM		
3L	BZ	1405	202/★ 2800	3R	
	HOLD R		12		
4L	BZ	1409	131/★ 1800	4R	
			1		
5L	OM27	1409	131/ 1480	5R	
	DEST	UTC	DIST	EFOB	
6L	LFBZ27	1411	26	5.3	6R



HOLD to ALTITUDE (HA)

This type of holding pattern is also part of an arrival or departure procedure.

The aircraft flies the hold until it reaches the specified altitude. Then it exits the hold automatically at the fix.

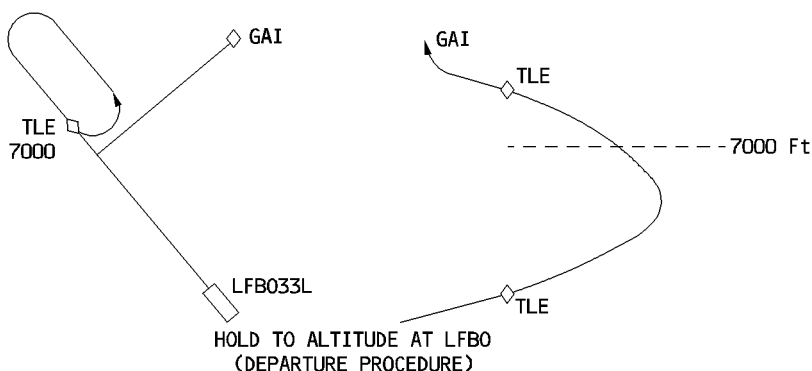
The predicted speed for the holding pattern is the lowest of the ICAO speed limits, the max endurance speed or any speed constraint.

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.

The HAs are in the navigation database as part of arrival or departure procedures and cannot be created by the crew.

	FROM	UTC	AIS55 →	SPD/ALT	
1L	LFB033L	1500	145/	500	1R
2L	LFB327	1501	148/	1300	2R
3L	TOUL9	1503	180/	3500	3R
4L	TLEΔ	1507	210/	7500	4R
5L	HOLD L	1514	250/	9000	5R
6L	GAI	1612	342	5.4	6R
	DEST		DIST	EFOB	
	LFP0				



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HOLD WITH MANUAL TERMINATION (HM)

This type of holding pattern may be part of an arrival procedure, or the pilot 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

FFC5-04-04.10-017-A001AA

DATABASE HOLD AT VNE	
INB CRS	
1L 103°	1R
TURN	
2L R	2R
TIME/DIST	
3L 1.0/4.0	3R
LAST EXIT	
4L UTC FUEL	4R
5L ----	5R
6L ←ERASE	6R INSERT★

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 ...

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COMPUTED HOLD AT PON	
INB CRS	
1L 125°	1R
TURN	
2L R	2R
TIME/DIST	
3L 1.5/8.0	3R
LAST EXIT	
4L UTC FUEL	4R
5L ----	5R
6L ←ERASE	6R INSERT★

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 ...

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HOLD AT D140L	
1L	INB CRS
	100°
	TURN
2L	L
3L	TIME/DIST
	1.5/8.0
4L	LAST EXIT
5L	UTC FUEL
	1228 3.2
6L	<RETURN
1R	
2R	
3R	
4R	
5R	
6R	

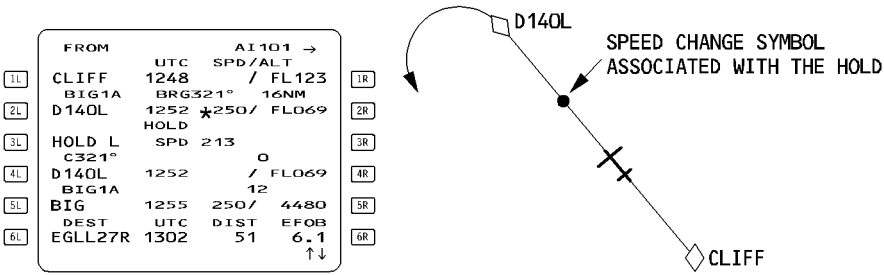
If the pilot inserts into the active flight plan a holding pattern that is manually corrected from a hold defined by the FMGS, the screen displays a “HOLD AT ...” page. The field 2R displays REVERT TO DATABASE or REVERT TO COMPUTED to restore the database data if necessary.

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.

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FFCS-04-04.10-019-ADD1AA

	HOLD AT D140L		
1L	INB CRS		1R
	321°		
2L	TURN		2R
	L		
3L	TIME/DIST		3R
	1.0/4.0		
4L		LAST EXIT	4R
		UTC FUEL	
5L		1325 5.2	5R
6L	<RETURN		6R

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.

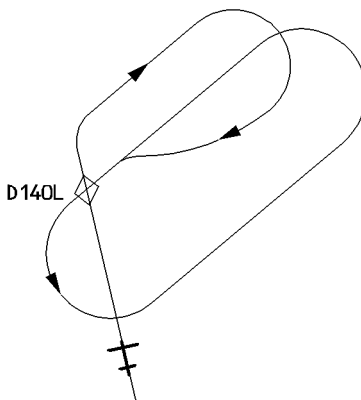
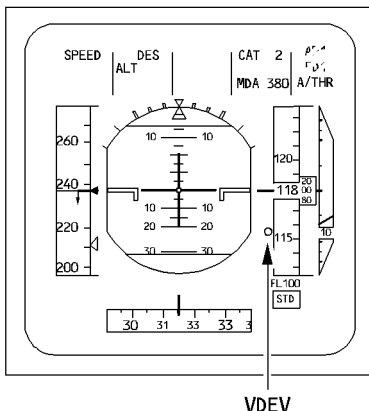
Upon reaching the speed change pseudo waypoint

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 crew had selected a speed target.

The hold speed is the lowest of :

- maximum endurance speed
- ICAO limit holding speed
- speed constraint (if any).

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 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.

FROM		AT 101 →	
1L	CLIFF	UTC 1248	SPD/ALT / FL123
2L	BIG1A	BRG321°	15NM
3L	D140L	1252 ★250/	FLO69
4L	HOLD R	SPD 213	EXIT★
5L	C321°	0	
6L	D140L	1252	/ FLO69
	BIG1A	12	
	BIG	1255	250/ 4480
	DEST	UTC	DIST EFOB
	EGLL27R	1302	51 6.1
			↑↓

← IMMEDIATE EXIT KEY

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.

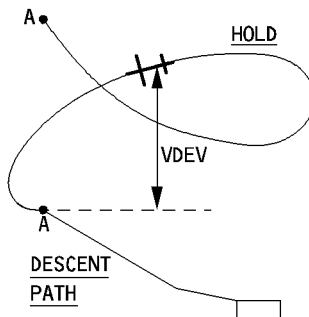
When the holding pattern was defined by a leg time (and not a leg distance), the system revises the size of the hold as a function of the target speed.

- 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.

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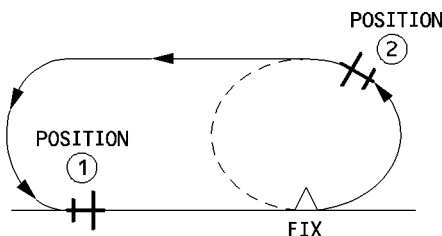
FROM	UTC	AI101 →	SPD/ALT	
1L D140L	1253		/FL100	1R
2L HOLD L			1NM	2R
C321°		SPD 212	EXIT*	
3L D140L	1256	212/	8NM	3R
BIG1A			12	4R
4L BIG	1259	250/	5340	5R
C335°			9	6R
5L BIG09	1300	"/*	2820	
DEST	UTC	DIST	EFOB	
6L EGLL27R	1306	42	5.8	
			↑↓	



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. The flight plan page displays "RESUME HOLD*" instead of "IMM EXIT".

FFCS-04-04.10-021-B001AA



FROM	UTC	AI101 →	SPD/ALT	
1L D140L	1253		/FL100	1R
2L HOLD L			1NM	2R
C321°		SPD 212	HOLD*	
3L D140L	1256		8NM	3R
BIG1A			12	4R
4L BIG	1259	250/	5340	5R
C335°			9	6R
5L BIG09Δ	1300	"/*	2820	
DEST	UTC	DIST	EFOB	
6L EGLL27R	1305	42	6.0	
			↑↓	

HOLD EXIT PROCEDURE

- Position (1) If "IMM EXIT" pressed, aircraft will exit at next fix overfly.
- Position (2) If "IMM EXIT" pressed, aircraft will make an immediate turn to the fix 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.

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If DES mode is engaged, the following applies :

- 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 – 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 descent below the next altitude constraint. If the aircraft reaches the next altitude constraint, it will level off and the altitude constraint mode will engage.

With RESUME HOLD pressed

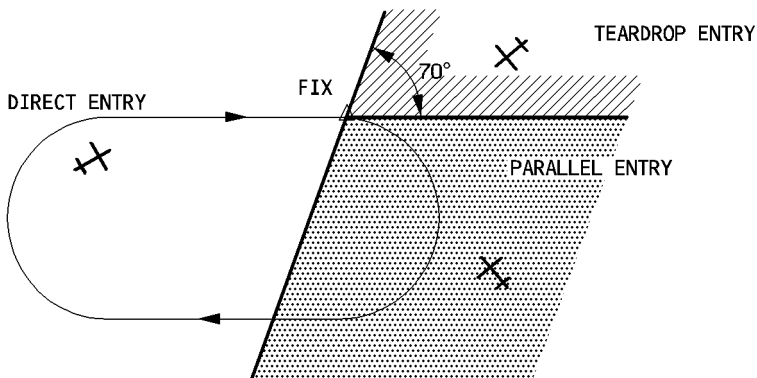
If the pilot presses the key next to “RESUME HOLD”, the aircraft remains in the holding pattern, and the display again shows “IMM EXIT”.

After that, each time the aircraft flies over the holding fix, the system updates the predictions for one more holding circuit.

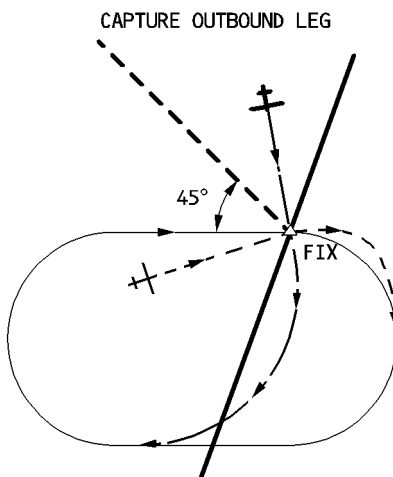
HOLDING PATTERN ENTRIES

The FMGS offers three types of entry into holding patterns :

1. Direct entry
2. Teardrop entry
3. Parallel entry



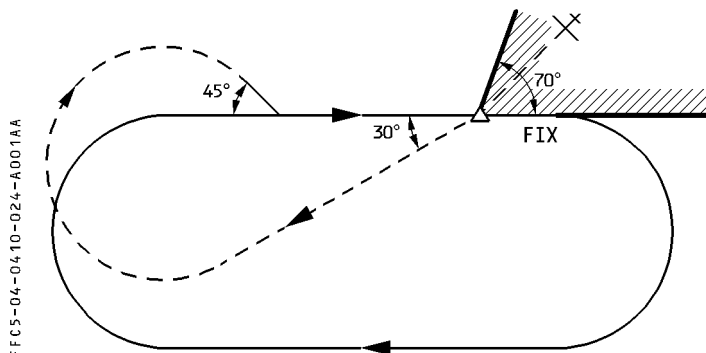
1. The direct entry



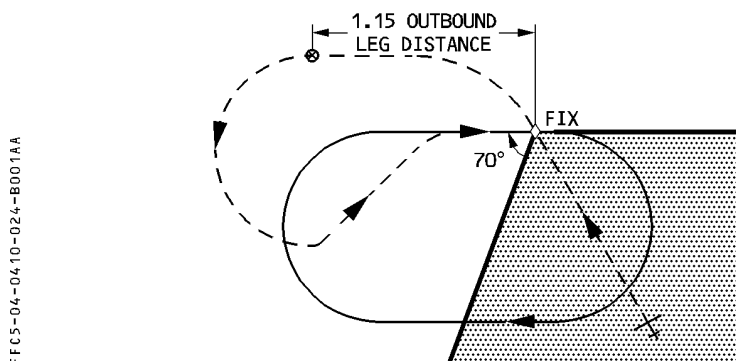
FFCS-04-04.10-023-A001AA

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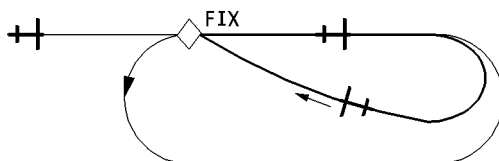
2. The teardrop entry



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 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 pilot to enter a holding pattern 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.

FFCS-04-04.10-025-A001AA

LAT REV FROM PPOS	
[1L]	FIX INFO>
[2L]	OFFSET LL XING/INCR/NO
[3L]	[] []°/[]/[]
[4L]	<HOLD
[5L]	
[6L]	<RETURN

LAT REV AT PRESENT POSITION

LAT REV FROM VNE	
[1L]	44°01.8N/011°00.2E
[2L]	FIX INFO>
[3L]	LL ING/INCR/NO
[4L]	[]/[]/[]
[5L]	<HOLD
[6L]	ENABLE
	←ALTN
	NEXT WPT
	[]
	NEW DEST
	[]
	AIRWAYS>
	<RETURN

LAT REV AT A WPT

- SELECT lateral revision at present position (PPOS) or an 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.

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COMPUTED HOLD AT PON	
[1L]	INB CRS
[2L]	125°
[3L]	TURN
[4L]	R
[5L]	TIME/DIST
[6L]	1.5/8.0
	LAST EXIT
	UTC FUEL

[6L]	←ERASE
	INSERT★

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.

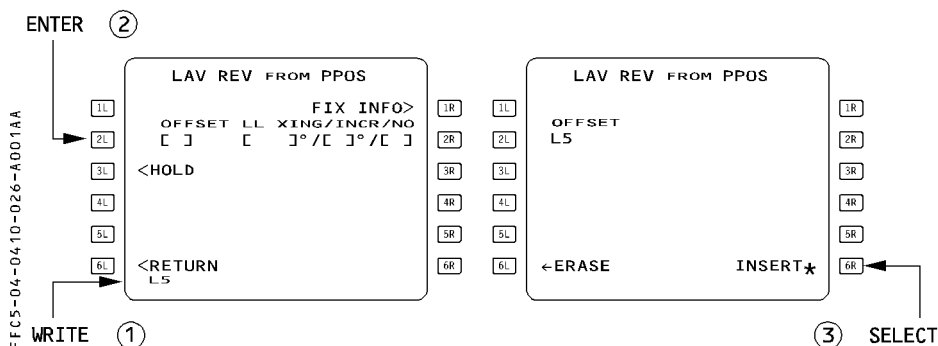
Accessed from lateral revision (LAT REV) at the present position page, an offset may be defined between 1 and 50 nautical miles in one-nautical-mile steps.

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".

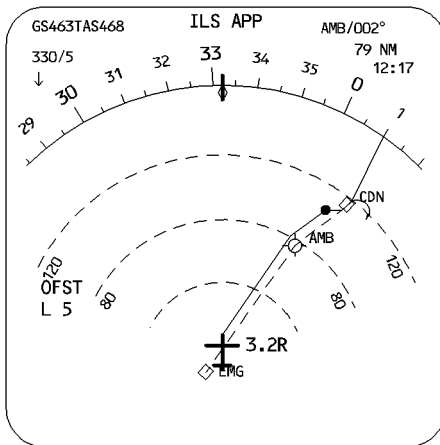


INSERTING AN OFFSET

- SELECT LAT REV at 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.

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	FROM	OFST	UTC	SPD/ALT	
[1L]	LMG	1205	/	FL330	[1R]
[2L]	UR 10	BRG004°		74NM	[2R]
[3L]	AMB	1217	.79/	FL330	[3R]
[4L]	UB 19	TRK023°		42	[4R]
[5L]	CDN	1222	"/	"	[5R]
[6L]	HOLD R	SPD	227		[6R]
	CO23°				
	CDN	1222	/	FL330	
	DEST	UTC	DIST	EFOB	
	EGLL27R	1300	363	6.3	
				↑↓	



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).

ENTER (2)

LAV REV FROM PPOS		LAV REV FROM PPOS	
[1L]	47°40.6N/001°11.6E	[1R]	FIX INFO>
[2L]	OFFSET LL XING/INCR/NO	[2R]	0
[3L]	5L [] °/[] °/[]	[3R]	
[4L]	<HOLD	[4R]	
[5L]		[5R]	
[6L]	<RETURN CLR	[6R]	←ERASE INSERT★

SELECT CLR (1)

(3) SELECT

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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 to change the preferred alternate, if necessary.

Access the ALTERNATE page through the ALTN prompt on LAT REV page at destination. The alternate airfields are attached to the destination.

ENTERING NEW ALTERNATE INTO THE F-PLN

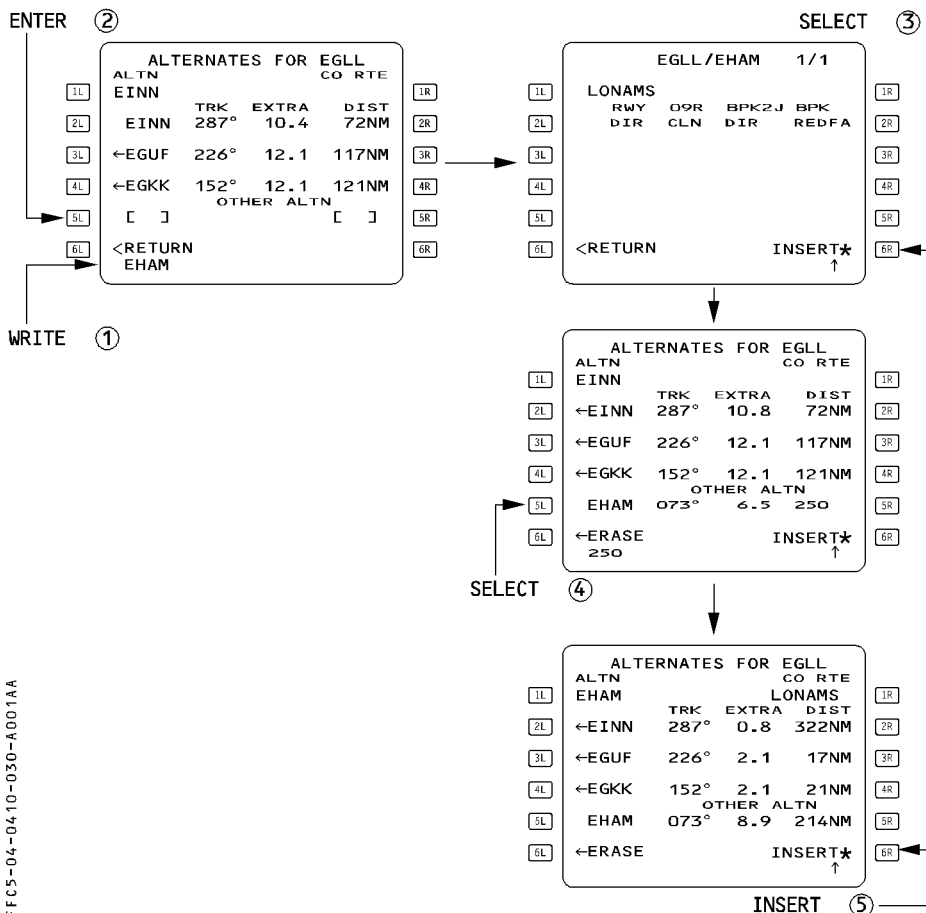
If the preferred alternate is not suitable, proceed as follows :

- SELECT F-PLN key on MCDU
- 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.*

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.



The pilot may enter a distance in OTHER ALTN field. The system will compute the extra fuel and the track for this distance.

PREDICTED DATA FOR ALTERNATE

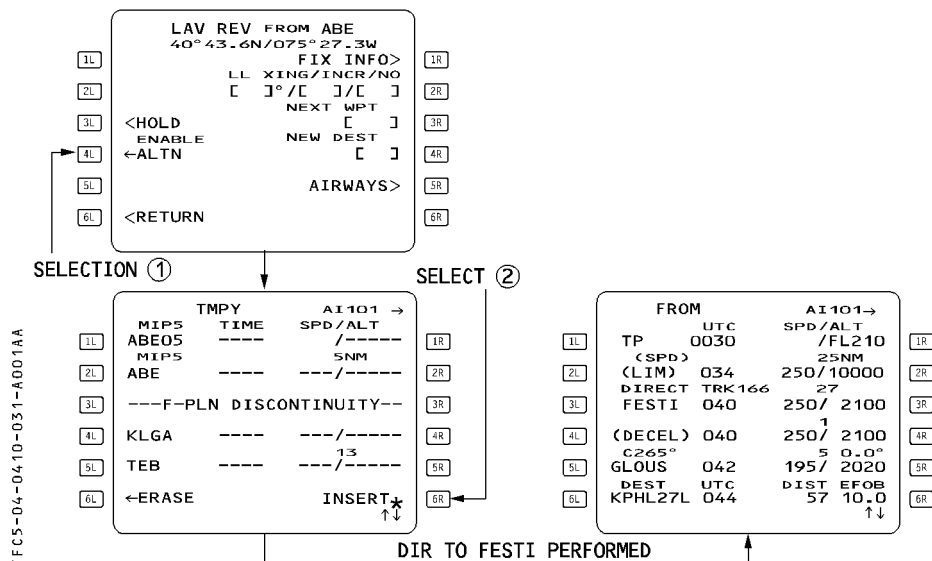
Data predictions are based on :

- * 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 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 OTHER ALTN field (used only for preliminary predictions).

ENABLE ALTN

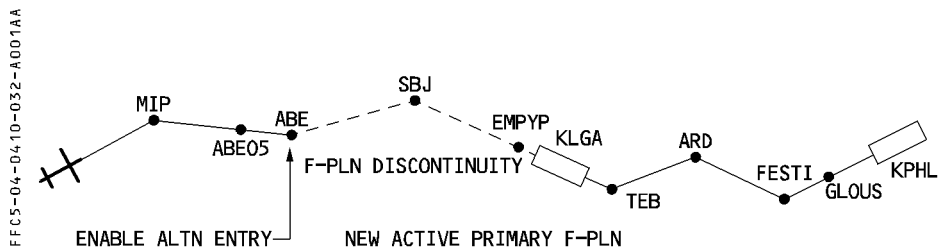
This allows the pilot to initiate a diversion by entering the alternate flight plan just after the revision waypoint (with a discontinuity).

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.

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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 NAV mode.*

Three functions are available through the DIR TO key :

- the DIR TO defines a direct leg from 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 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 to define a specified RADIAL INBOUND or OUTBOUND 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.

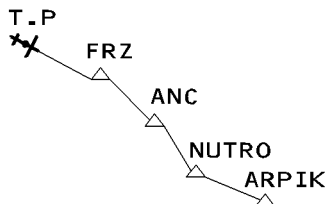
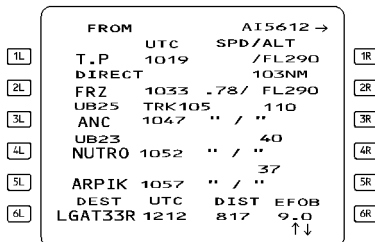
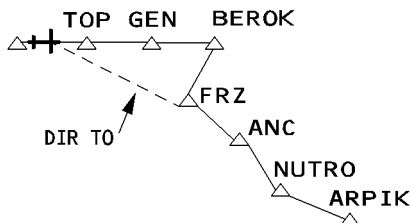
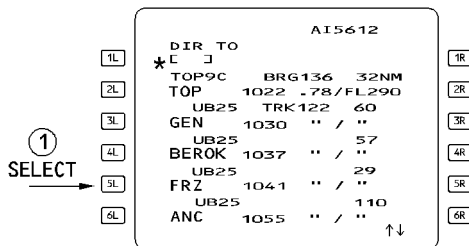
The ND displays the DIR TO leg as a temporary flight plan leg between current aircraft position and specified waypoint. In case of a DIR TO/INTCPT the leg is not displayed when the angle between the current aircraft track and the intercept radial exceeds 160°.

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"



RESULTING F-PLN AND ND DISPLAY

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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)

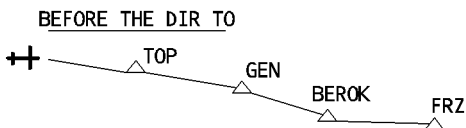
- PRESS the DIR key.
- WRITE the waypoint identifier (e.g. ABC) into the scratchpad.
- PRESS [1 L] to enter "ABC" in the "DIR TO" field.

② ENTER → [1L]

WRITE [6L]

①

DIR TO		A15612	
* []			
TOP9C	BRG136	32NM	
TOP	1022	.78/FL290	
UB25	TRK122	60	
GEN	1030	" "	
UB25		57	
BEROK	1037	" "	
UB25		29	
FRZ	1041	" "	
UB25		110	
ANC	1055	" "	
ABC			↑↓



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[1L]

[2L]

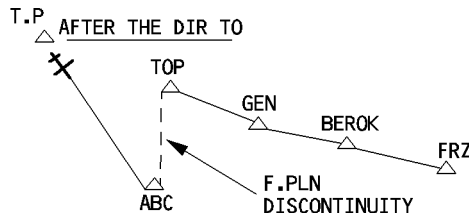
[3L]

[4L]

[5L]

[6L]

FROM		A15612 →	
	UTC	SPD/ALT	
T.P	1019	/FL290	
DIRECT	BRG157	54NM	
ABC	1026	.78/ FL290	
-F.PLN DISCONTINUITY--			
TOP	1034	" / "	
UB23		60	
GEN	1042	" / "	
DEST	UTC	DIST EFOB	
LGAT33R	1221	898 8.4	↑↓



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.

	FROM	AI5625	
	UTC	SPD/ALT	
1L	AAA	1436	FL320
2L	MANUAL		
3L	--F-PLN DISCONTINUITY--		
4L	CCC	1459	----/----
			1R
			2R
			3R
			4R

- 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 loses 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.

	FROM	AI5613	
	UTC	SPD/ALT	
1L	PPOS	1320	FL220
2L	--F-PLN DISCONTINUITY--		
3L	GEN	1341	.78/FL220
4L	UB25		.57
	BEROK	1350	" / "
			1R
			2R
			3R
			4R

- In both of these cases, the only way to return to a standard flight plan is to perform a “DIR TO” a designated waypoint.

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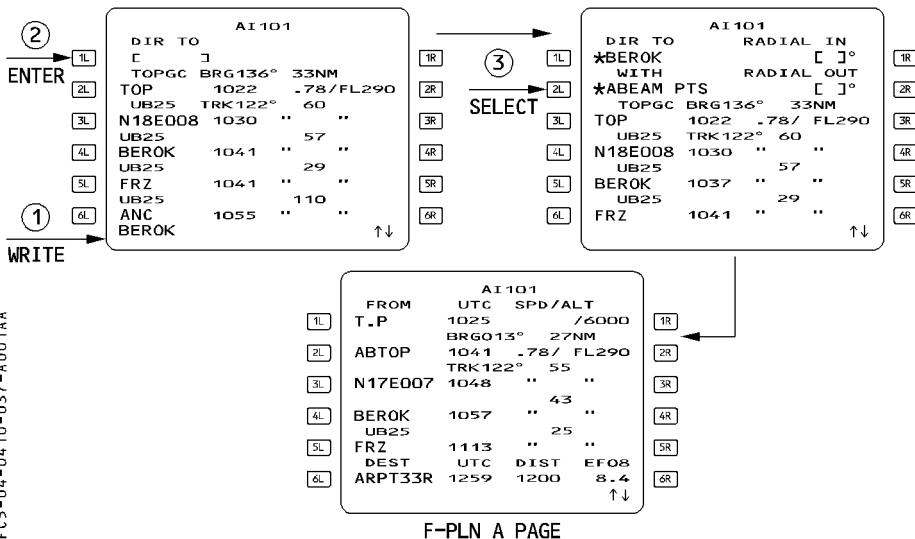
FFCS-04-04.10-036-B001AA

PROCEDURE FOR DIR TO/ABEAM

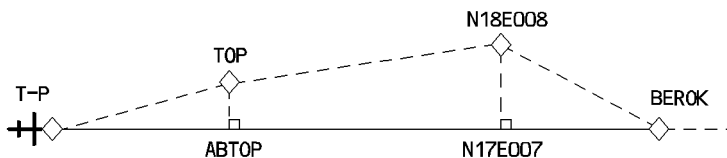
Example : DIR TO/ABEAM BEROK

- 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.



- 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).



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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.

The MCDU displays in [1R] and [2R] field the functions radial inbound and radial outbound from the waypoint.

If the waypoint belongs to the flight plan, the system displays the track of the flight plan as defaulted radial inbound. The crew can modify it.

- WRITE the required radial in or out into the scratchpad.
- PRESS [1R] or [2R] key to enter the radial in the required field.

The ND displays the entered radial in amber dotted line : the pilot can still modify it.

- PRESS [1R] or [2R] key to confirm the DIR TO/INTERCEPT selection.

The display reverts to F-PLN A page, and the system arms NAV mode, and engages 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.

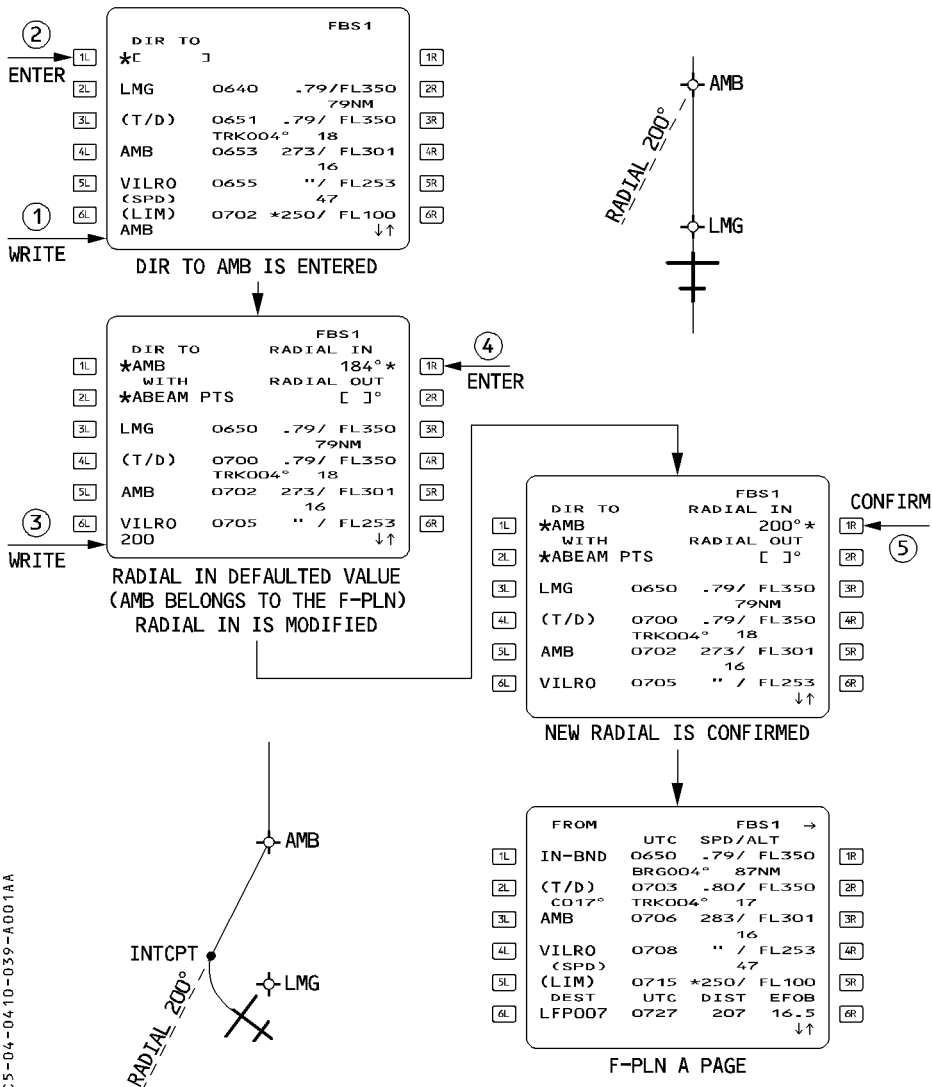
3. If the current AP/FD lateral mode is HDG or TRK, NAV becomes armed.

If 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

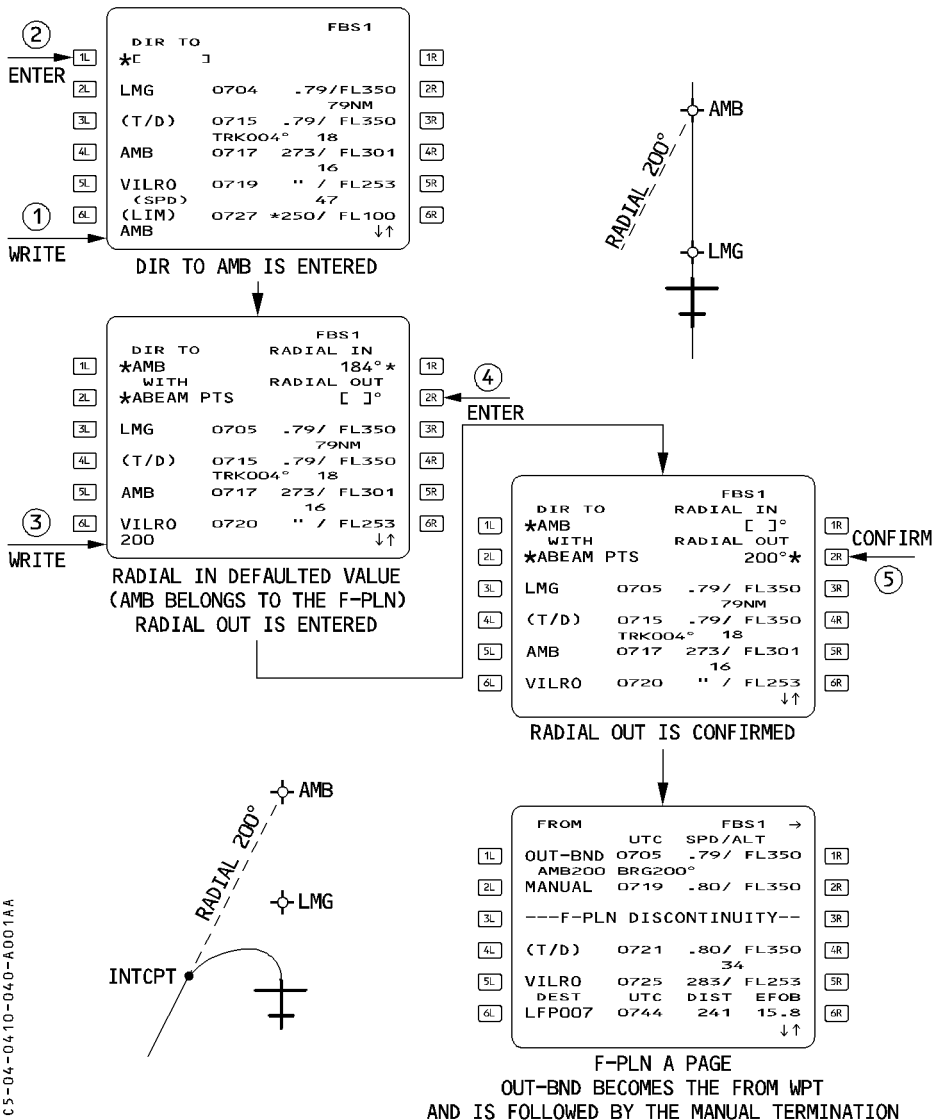
DIR TO AMB - RADIAL 200° INBOUND



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Example : RADIAL OUTBND

DIR TO AMB - RADIAL 200° OUTBOUND



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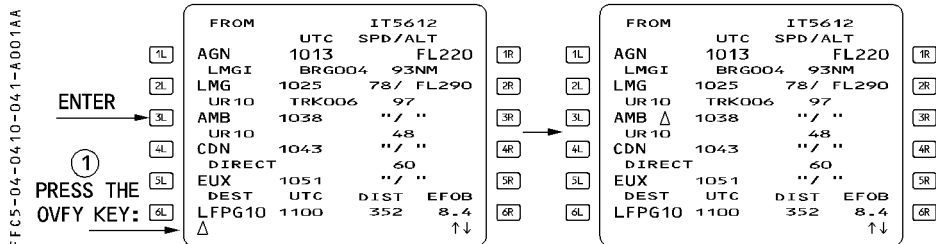
OVFY (OVERFLY) KEY

The overfly key programs the Flight Management Guidance Computer to fly over a specific waypoint or navaid. To use it :

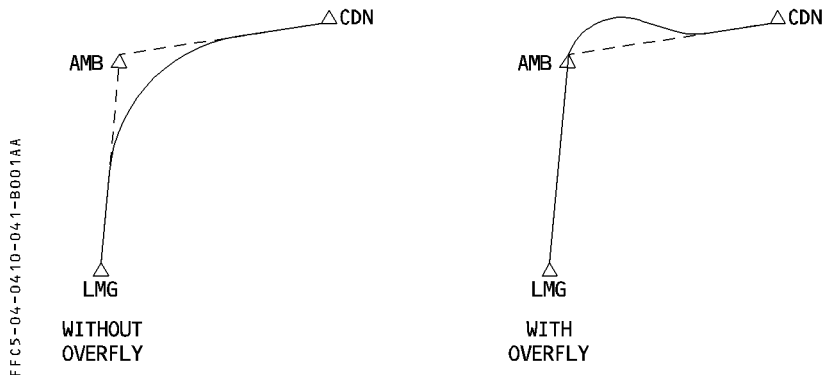
– PRESS the “OVFY” key.

A “△” appears in the scratchpad.

– INSERT it by pressing the key adjacent to the waypoint to be overflowed. [3L] in this example.



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.

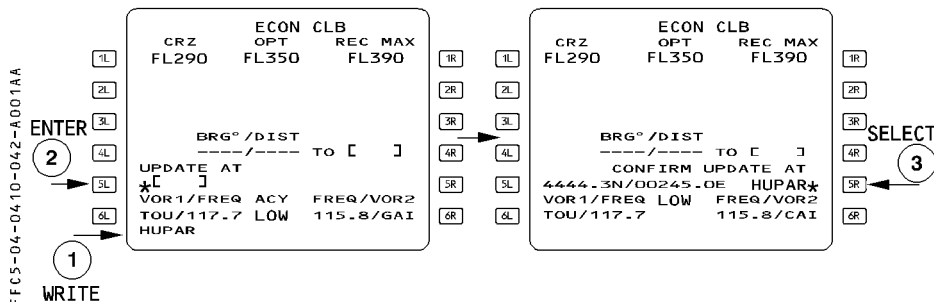


The overfly function allows you to fly over a specific waypoint, and then returns the aircraft to the great circle track.

UPDATE AT

The pilot uses "UPDATE AT" on the PROG page to manually change the position the FMGS has computed (FM position and bias).

Use this facility with extreme caution : it is apt to be inaccurate because the system relies on the pilot's estimating when a designated position has been reached.



- WRITE the identifier for the navaid (or waypoint, or airport) or the coordinates or the PBD or PB/PB at which an update is intended.
- PRESS [5L] to enter the identifier 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 [5R] 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.

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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 nav aids. 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 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.
 - A "CHECK IRS/FM POSITION" message appears on the MCDU.
 - A "FM/IR POSITION DISAGREE" message appears on the ECAM.

◀ 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 inaccurate will have a temporary effect on the FM position.