

	FLIGHT PHASE RELATED PROCEDURES		4.05.60	P 1
	DESCENT		SEQ 100	REV 11

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, MANAGED MACH/SPD, SPD CSTR, SPD LIMIT) to reach VAPP at 1000 feet AGL.

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 (T/D) :

- SELECT the altitude target.
- PUSH the ALT selector knob. DES mode engages.
- CHECK the FMA annunciators.

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**

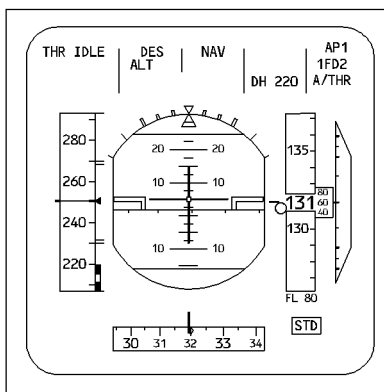
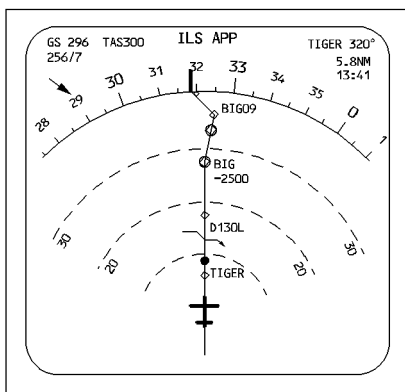
The aircraft is considered to be on the vertical profile when it is within 50 feet of it.

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 autothrust adjusts the thrust for the particular segment. The first FMA column may display “THR IDLE” or “SPEED”.

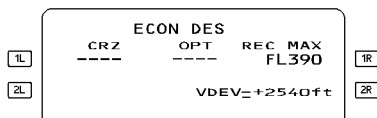
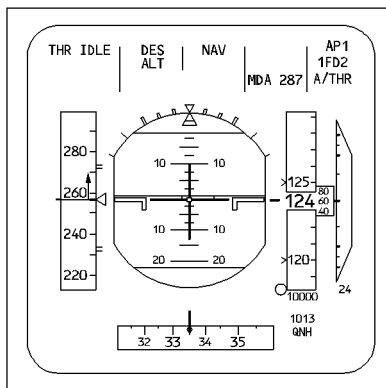
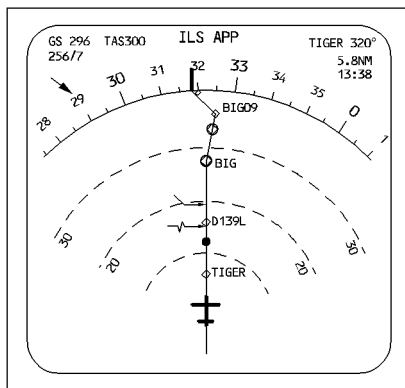
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● If the aircraft is above the descent profile

VDEV is down on the PFD and positive on the PROG page.

The autothrust 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.



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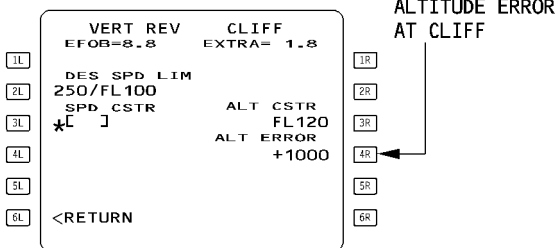
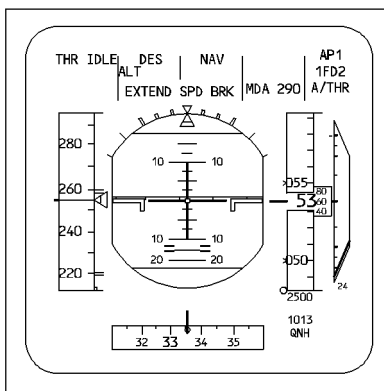
Procedure

- SELECT a descent speed higher than the upper limit when possible.
- MONITOR the intercept symbol ↗.

When this symbol reaches the next ALT CSTR waypoint "EXTEND SPD BRK" 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 speedbrake 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.



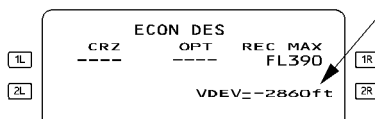
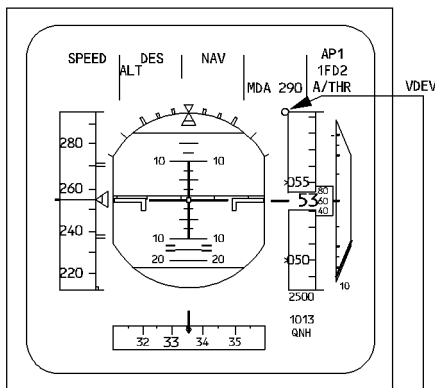
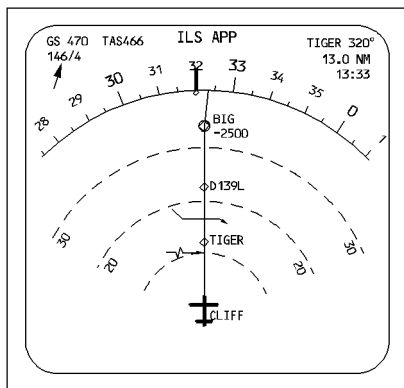
- If a speed constraint is predicted to be missed :
 - SELECT an appropriate speed.
 - RESUME managed speed when the aircraft is back on the descent path.

● 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.

The autothrust is in speed mode with a –1000 ft/min rate of descent until the profile is regained.



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If the rate of descent has to be increased (ATC requirement) :

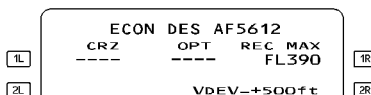
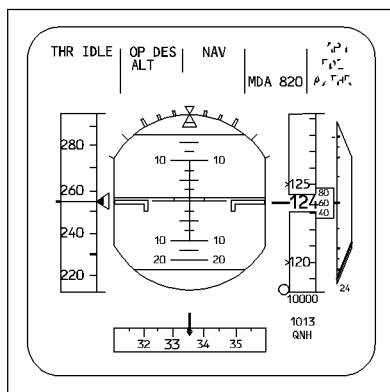
- SELECT OP DES mode
- Increase the target speed or extend the speedbrakes.

OP DES, VIS 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 waypoints with an altitude constraint. If NAV mode is disengaged, the circles are 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 taken into account.

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Vertical position may also be accessed by using the energy circle displayed on the navigation display when HDG/TRK is engaged.

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Procedure

- SET the FCU altitude as cleared by ATC, while also considering the applicable safe altitude.
If the next safe altitude is higher than the ATC-cleared altitude, check with ATC that this constraint applies.
If confirmed, set the FCU altitude at 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.
 - MONITOR the energy circle on the ND when in HDG/TRK mode.
- The MCDU F-PLN page presents SPD/ALT constraint-matching predictions, which assume that DES mode is reengaged immediately.
- CHECK the predictions before reengaging DES mode (in order to resume the descent profile).

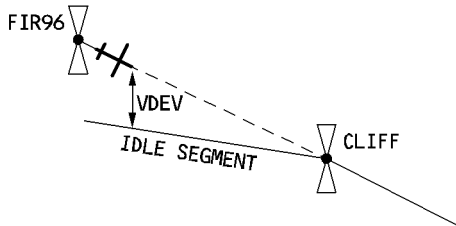
Note : *VDEV is available on the PFD even in HDG mode ; it is a valuable tool for monitoring the descent as long as cross-track error (XTK) is less than five nautical miles*
The aircraft decelerates for approach automatically only if it flies over the DECEL pseudo waypoint with NAV mode engaged (or LOC, LOC).*

MONITORING THE NAVIGATION IN THE TERMINAL CONTROL AREA

If the MCDU message “SYSTEM RNP IS XX.X” is displayed, you 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).

TOO STEEP PATH

“TOO STEEP PATH AHEAD” appears on the MCDU scratchpad when the system predicts this situation. TOO STEEP PATH is displayed on the F-PLN page.
When the aircraft is crossing the first waypoint of a TOO SPEEP 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.



FFCS-04-0560-008-A100AA

1L	VERT REV AT FIR96	1R
2L	EFOB=6.4 EXTRA=3.0	2R
3L	TOO STEEP PATH BEYOND	3R
4L	DES SPD LIM UTC CSTR	4R
5L	250/FL100 []*	5R
6L	SPD CSTR ALT CSTR	6R
	*[] +FL260	
	<WIND	
	<RETURN	

1L	UB191 UTC SPD/ALT	1R
2L	ABB 1238 .78/FL330	2R
3L	(T/D) 1239 .79/FL330	3R
4L	BIG1A TRK320° 21	4R
5L	FIR96 1242 310/*FL260	5R
6L	-----TOO STEEP PATH-----	6R
	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 “EXTEND SPD BRK” message.
 - CONSIDER using a holding pattern, if necessary.

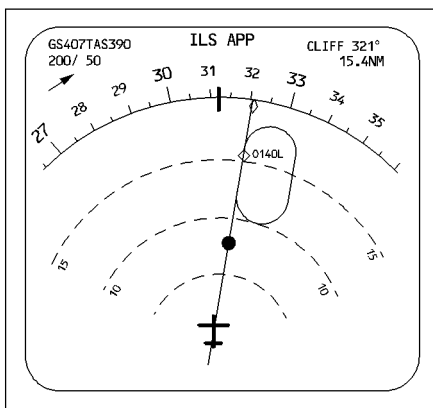
HOLDING PATTERN

A hold may be required during the descent and 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 inappropriate increase of speed.



FROM		AT 101 →	
1L	CLIFF	1248	SPD/ALT / FL123
2L	BIG1A	BRG321°	16NM
3L	D140L	1252	*250/ FLO69
4L	HOLD R	SPD 213	
5L	D140L	1252	/ FL069
6L	BIG1A	1255	250/ 4480
	DEST	UTC	DIST EFOB
	EGLL27R	1302	51 6.1
			↑ ↓

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	FLIGHT PHASE RELATED PROCEDURES		4.05.60	P 10
	DESCENT		SEQ 001	REV 11

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.