

Id.: FCOM/PRO/NOR/SRP/01/60/A/00004008.0032001 / 18 Oct 12

Criteria: 22-1171, P3379, P6578, P7373, P7519, P8483, SA

Applicable to: MSN 1938, 2035, 2059, 2071, 2081, 2100, 2109, 2140, 2213, 2228, 2317, 2344, 2350, 2456, 2582, 2601, 2686, 2705, 2716, 2721, 2750, 2918, 2938, 2951, 2961, 2967, 2972, 3008-3009, 3051, 3065, 3098, 3372, 3399, 3401, 3419-3420, 3441, 3470, 3777, 3795, 3814, 3825, 3859, 3884, 3930, 4063, 4084, 4105, 4137, 4139, 4241, 4251, 4267, 4295, 4298, 4335, 4402, 4601, 4604, 4664, 4714, 4747, 4800, 4820, 4901, 4908, 5084, 5129

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 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.

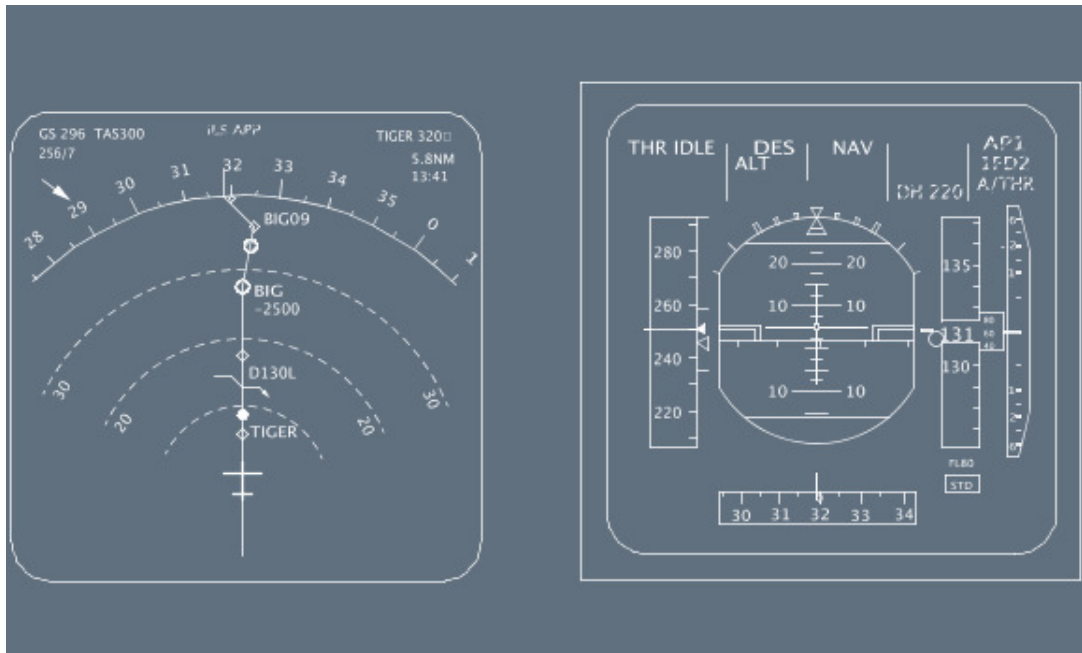
MONITOR the FMA (ALT*, ALT CST*, ALT, ALT CST), when the aircraft reaches level symbols.

If the aircraft is on the descent profile:

The aircraft is considered to be on the vertical profile, when it is within 50 ft 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.

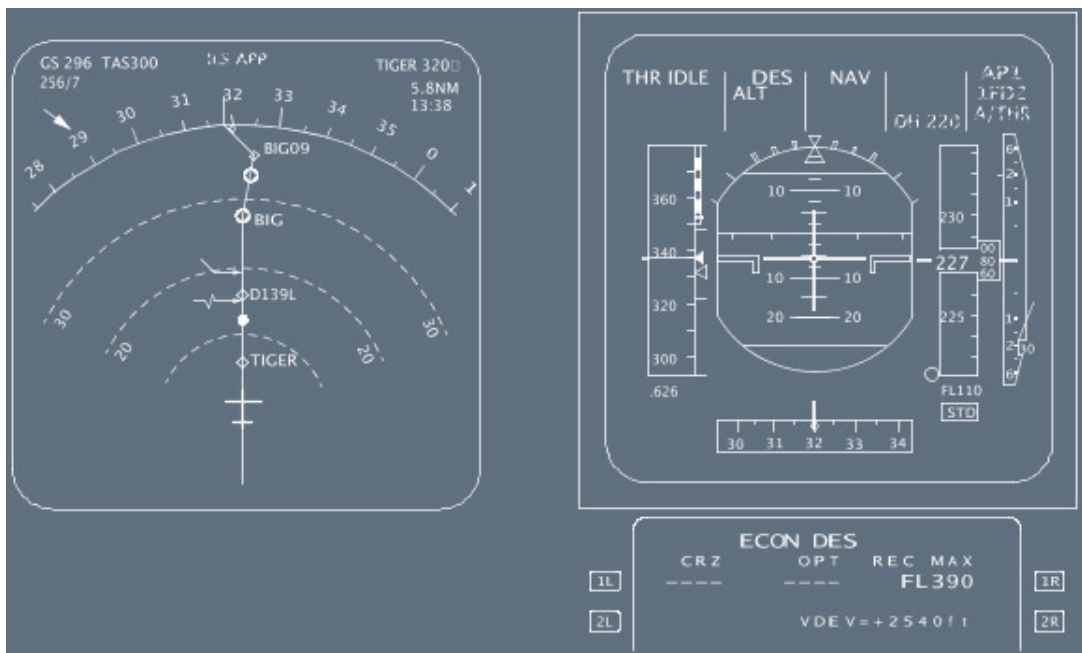
A/THR adjusts thrust for the particular segment. The first FMA column may display "THR IDLE" or "SPEED".



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.



Procedure

SELECT a descent speed higher than the upper limit when possible.

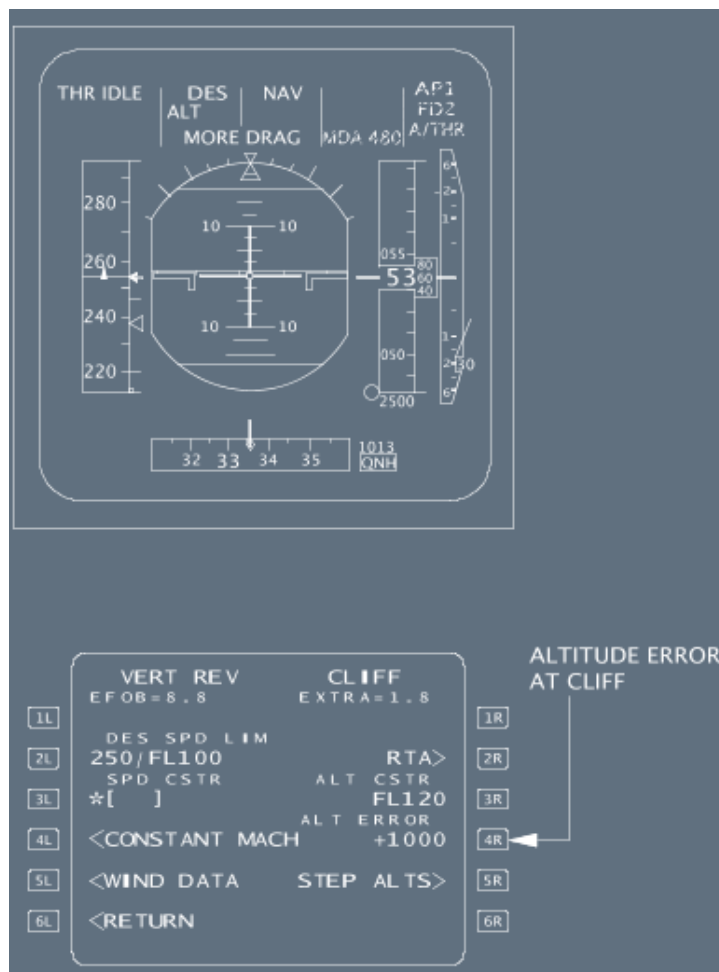
MONITOR the intercept symbol .

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, speed brake extension will not necessarily increase the descent rate. It does so, 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 ft the vertical revision page shows ALT ERROR at the waypoint.



If a **speed constraint** is predicted to be missed by more than 10 kt:

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).

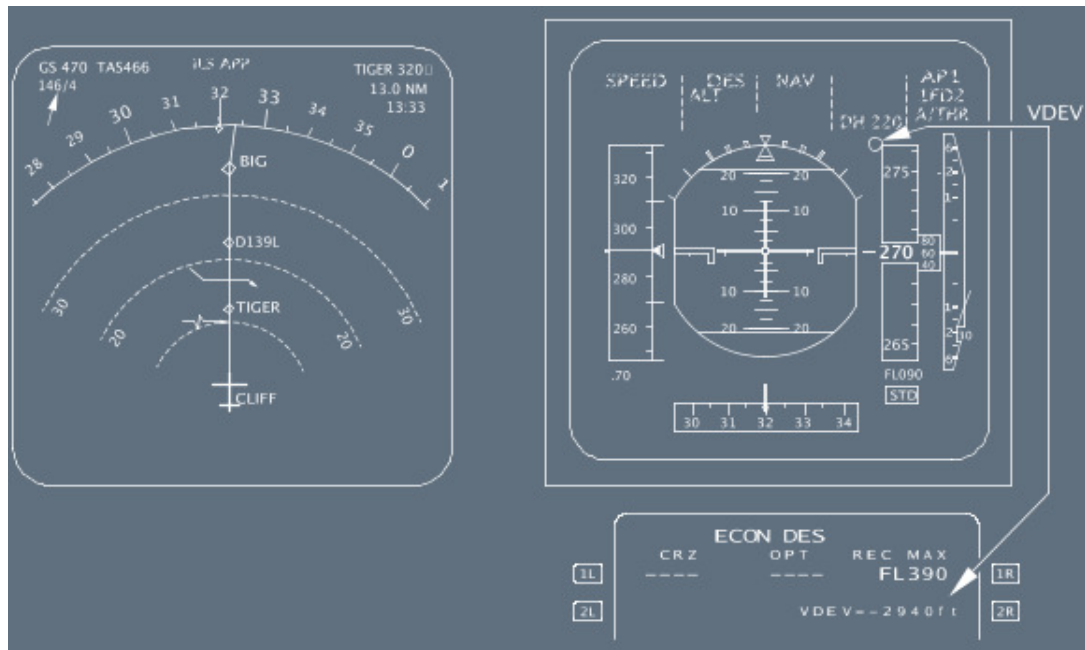
MONITOR the intercept symbol ([V]) on the ND and any leveling off at the next ALT CSTR.

If the aircraft is flying at an altitude that is higher than both the descent speed limit altitude and the destination elevation +5000 ft:

The FMGS maintains the V/S at -1000 ft/min and the target speed, until the aircraft reaches the altitude constraint or intercepts the descent profile.

If the aircraft is flying at an altitude that is lower than either the descent speed limit altitude, or the destination elevation +5000 ft:

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.



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

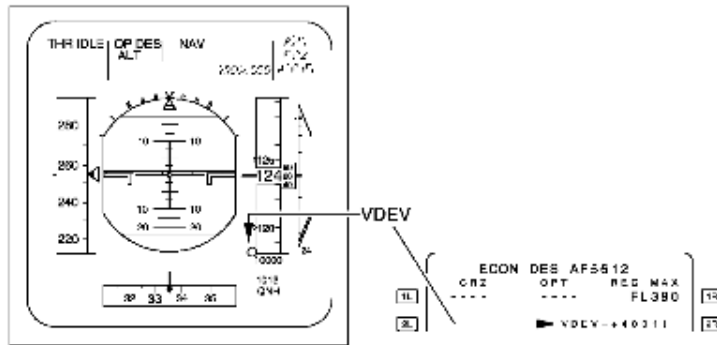
SELECT OP DES mode

Increase the target speed or extend the speedbrakes.

Id.: FCOM/PRO/NOR/SRP/01/60/A/00004009.0002001 / 18 Oct 12
Criteria: 34-1208, 34-1162, P5168, SA
Applicable to: ALL

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.

When in HDG/TRK mode, MONITOR the energy circle # 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 5 nm.

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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