



Introduction to the B737-NG **Vertical Situation Display (VSD)**



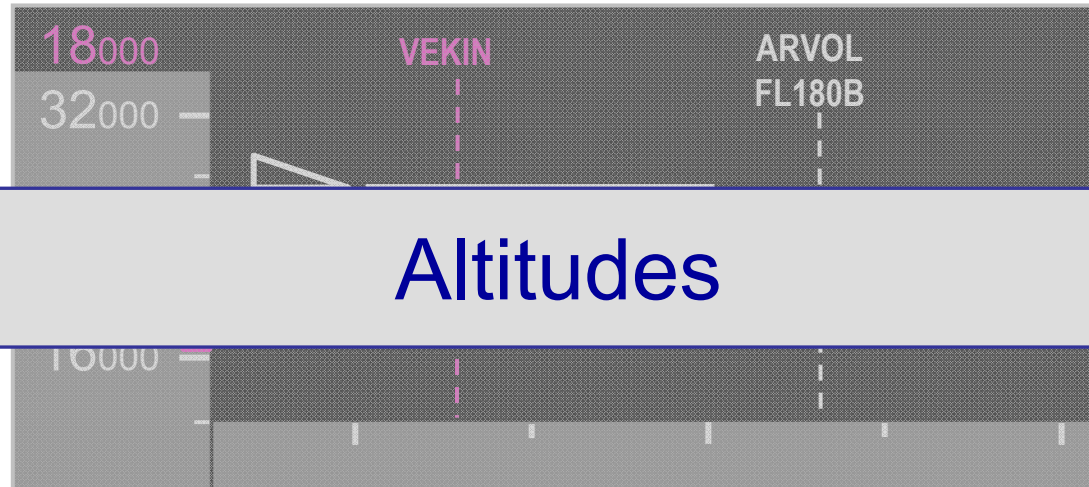
The purpose of the VSD is to present a clear graphical picture of the airplane's vertical flight path for enhancing the flight crews' vertical situation awareness.

The VSD depicts the vertical situation of the airplane relative to the terrain throughout all phases of flight.

The VSD also depicts the vertical situation of the airplane relative to the runway during final approach.

The VSD complements the increased use of constant-angle, area navigation and RNP approaches by providing immediate validation of the selected approach path and allowing full-time monitoring of the airplane position relative to the selected glide path.







The bottom of the **Airplane symbol** indicates the current airplane altitude with reference to the Altitude Reference Scale on the left. (shown here is 4700 feet)

Altimeter info comes from ADIRU 1

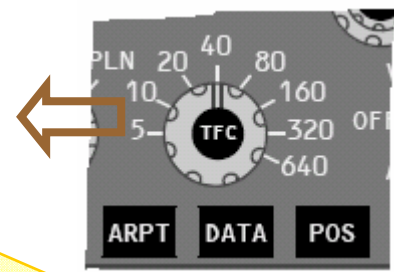
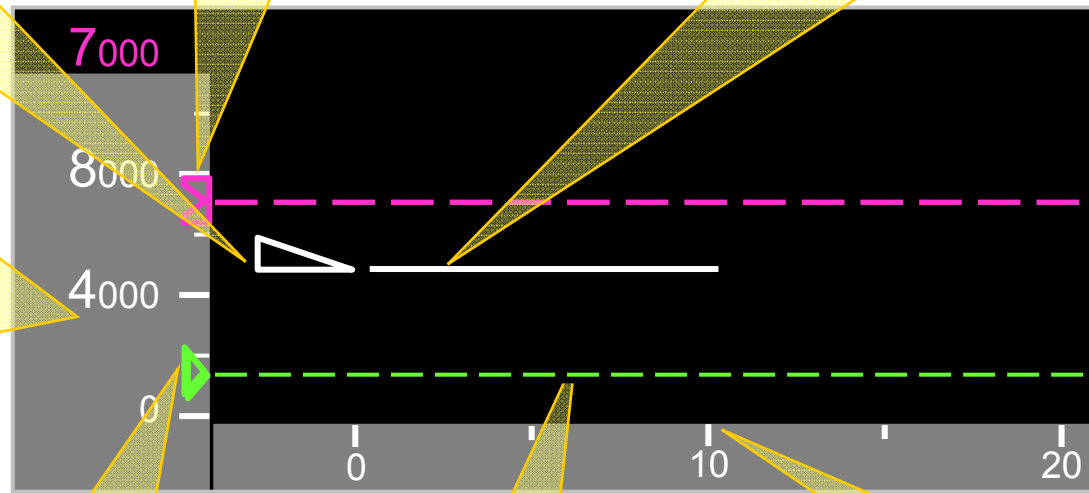
The **Altitude Reference Scale** is displayed on the left side.

The scale changes auto-matically when selecting another horizontal range.

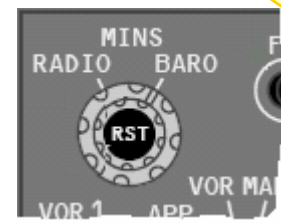
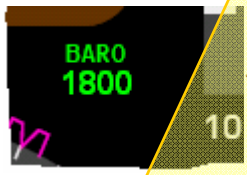
For all settings up to 80 NM, the scale ratio is fixed, so that a 3 degree approach will always appear the same.

MCP selected altitude is indicated in magenta above the Altitude Ref. Scale and displayed by a magenta dashed line.

The **Vertical Flight Path Vector** indicates current flight path angle as a function of vertical speed and ground speed. The length of the white line is fixed at one half of the horizontal range.

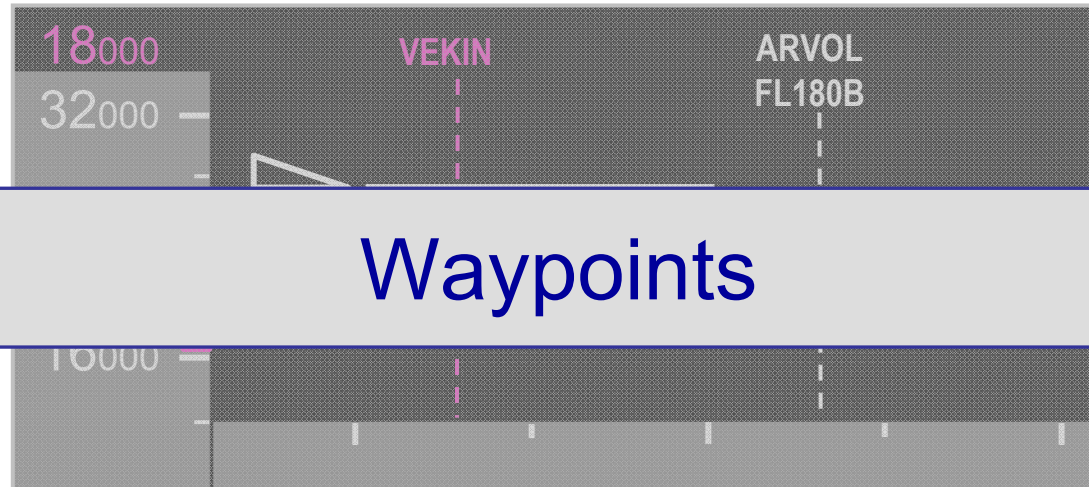


The **BARO Minimums Pointer** displays the barometric minimums selected on the EFIS control panel. (shown here is 1800 feet)



When selecting **RADIO**, the green line **disappears** and only the green pointer remains, at the BARO altitude.

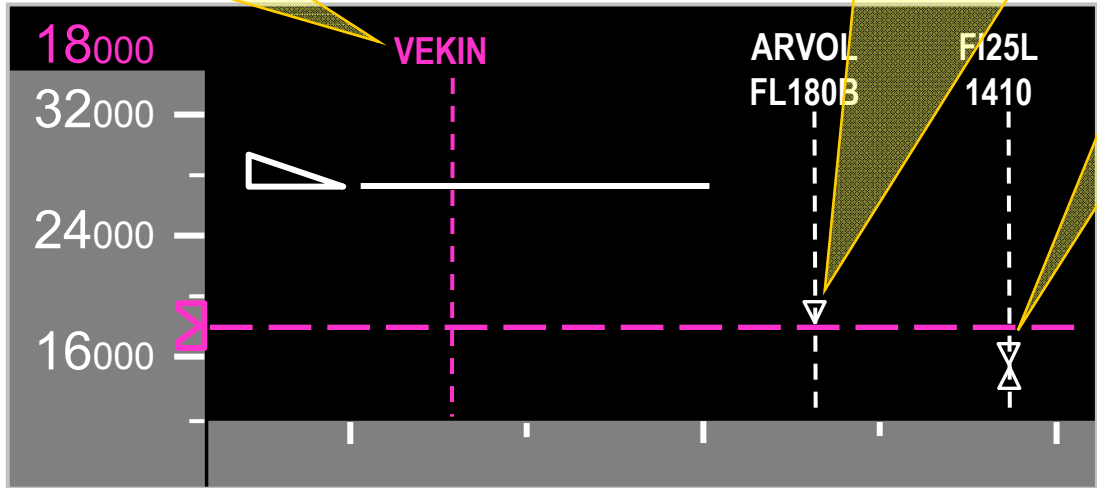
The **Horizontal Distance Scale** is displayed at the bottom of the VSD. The range shown on the VSD is one half the range selected on the EFIS control panel.

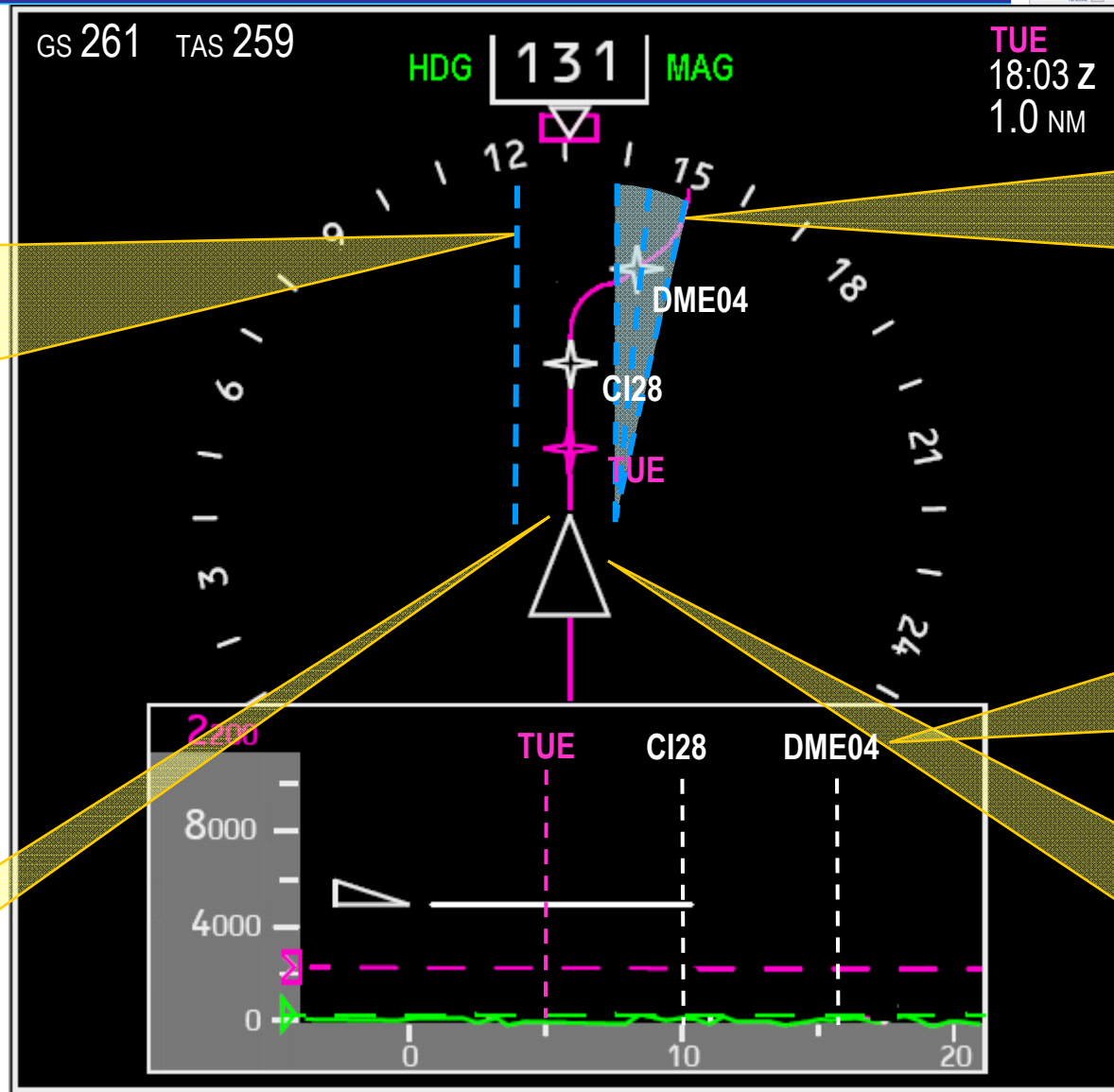




The active **Waypoint ID** is displayed in magenta, all other waypoints from the FMC LEGS Page within the selected range are displayed white.

Different **Altitude Constraint Symbols** are displayed according to restrictions programmed in the FMC LEGS Page.





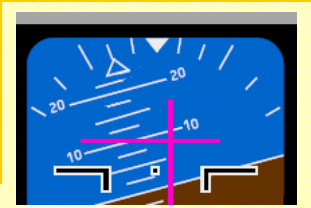
Only waypoints within the cyan dashed **Enroute Swath lines** are displayed on the VSD.

In this example **DME04** is outside the enroute swath and therefore not displayed on the VSD.

The same goes for **Terrain profiles**. (see further)

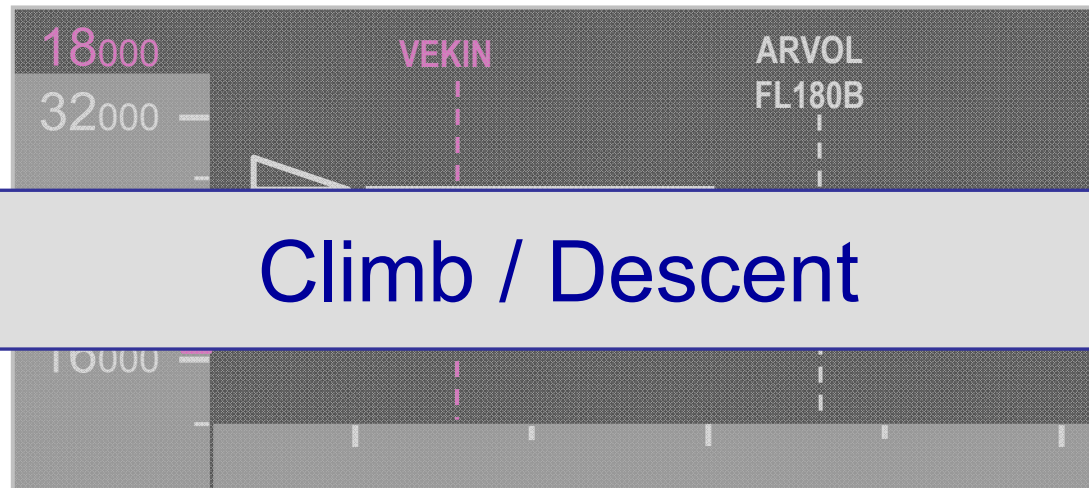
The enroute swath is **1 NM on each side of the airplane actual track line**.

During turns, the swath edge on the inside of the turn opens in the direction of the turn. The swath angle increases with the bank angle.



DME04 will now show on the VSD

The enroute swath lines are **inhibited** on takeoff and in approach when the airplane is **within 6 NM** of the runway and less than 3000 ft above field elevation.

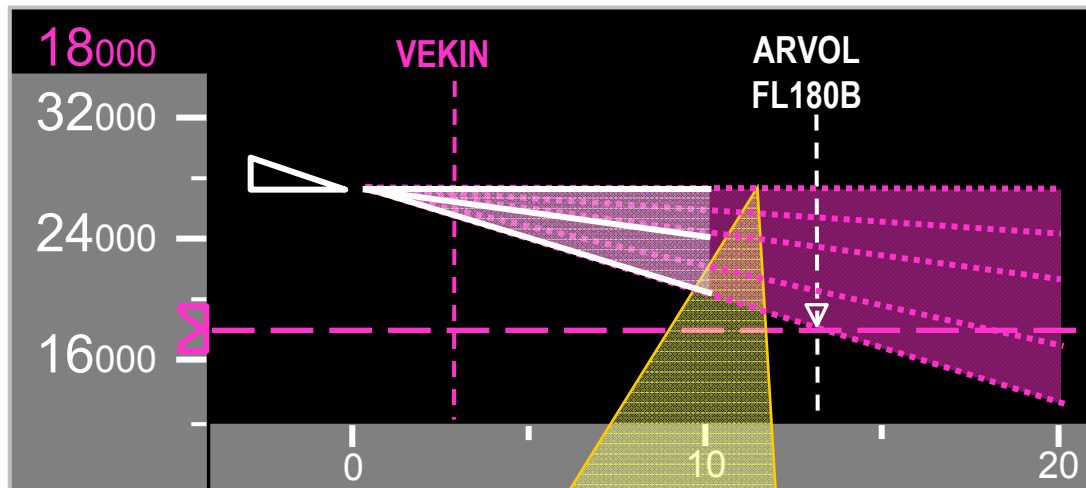


Climb / Descent

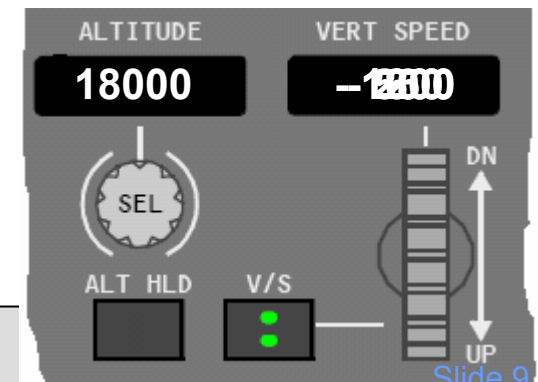


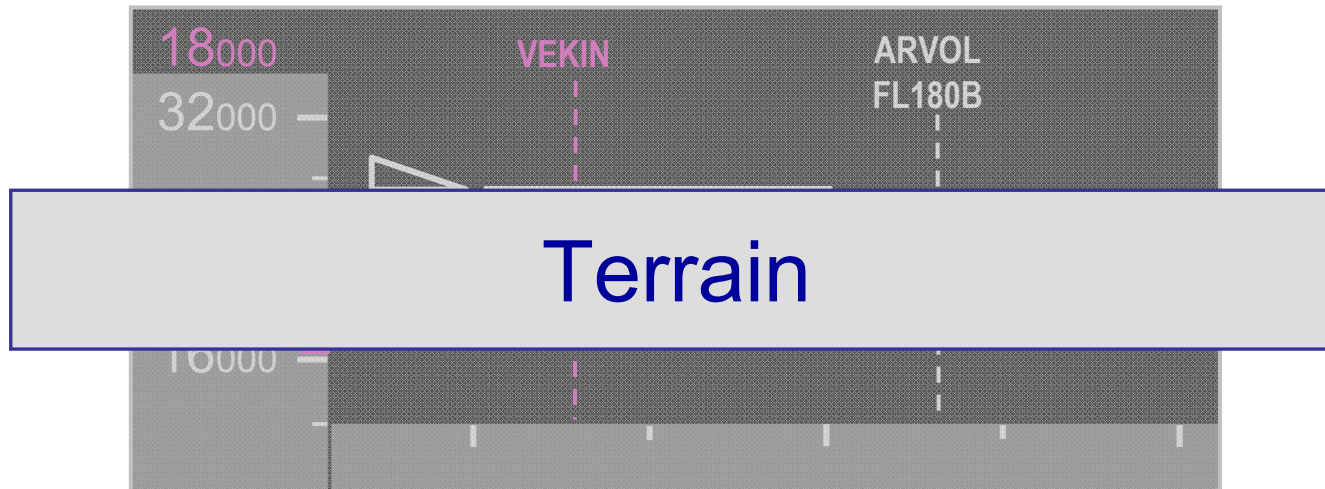
Note :

The MCP selected vertical speed line may show on one pilot's VSD and not on the other pilot's display, if that F/D side has [G/S] captured.



The **MCP selected Vertical Speed** is displayed by a magenta dotted line. The line appears only when the V/S mode on the MCP is selected. You can use this line the same way as the “green banana” to adjust the required rate of climb or rate of descent.

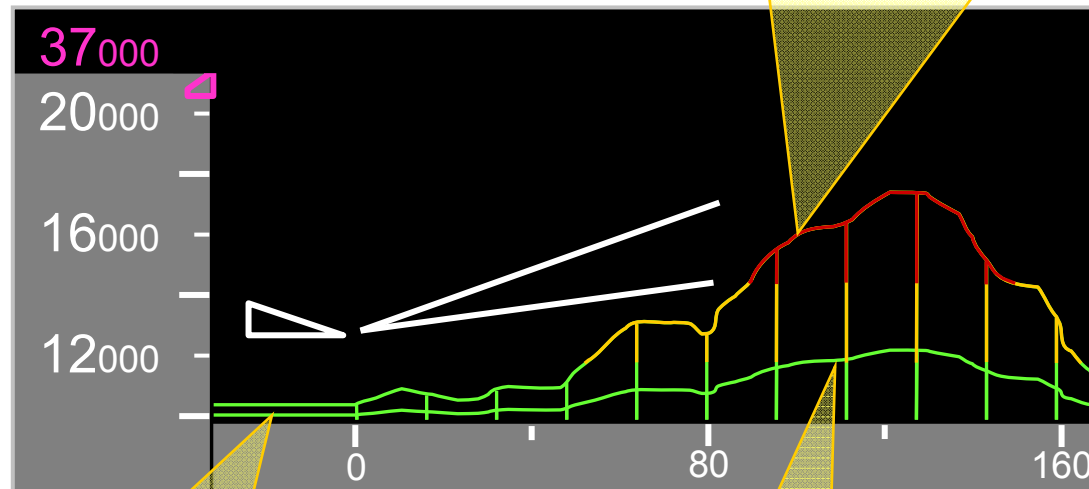






VSD terrain uses the same color coding that is used to depict EGPWS terrain on the lateral map :

- **green**: terrain 250-500 ft or more below the airplane
- **amber**: terrain from 250-500 ft below to 2000 ft above the airplane
- **red**: terrain more than 2000 ft above the airplane



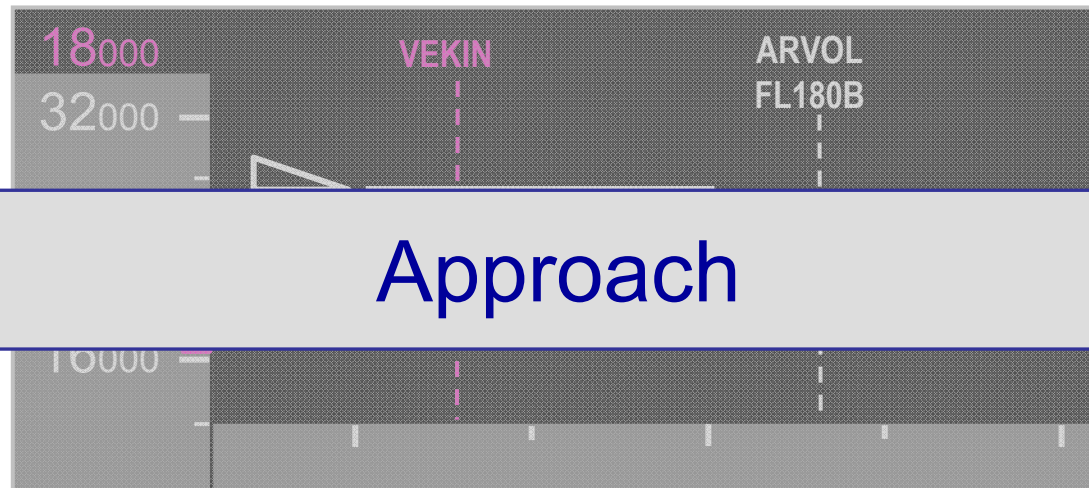
The VSD will always show terrain profile, regardless **TERR** has been pressed on the EFIS control panel.

This allows the pilot to select **WXR** on the ND and still have terrain profile on the VSD !

Terrain behind the airplane is drawn equal to the terrain at the current position.

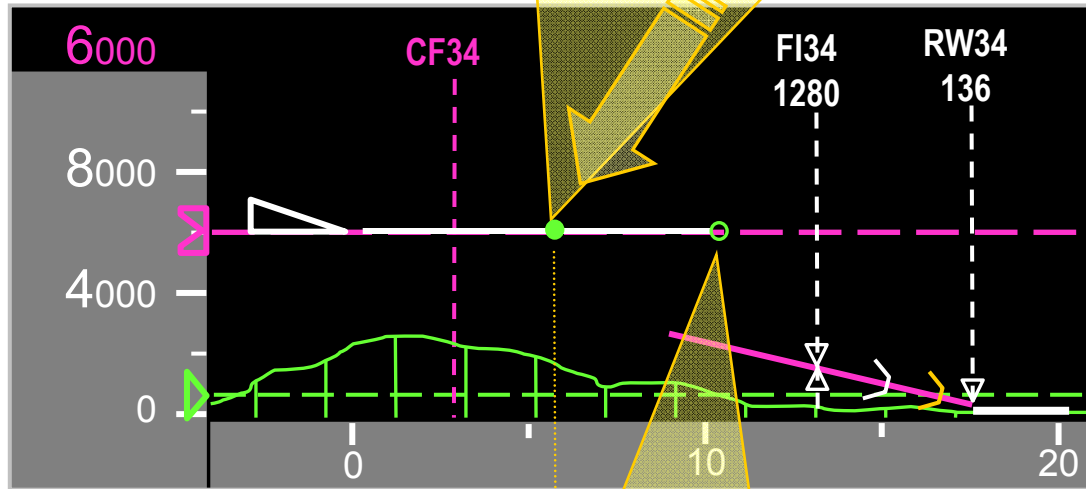
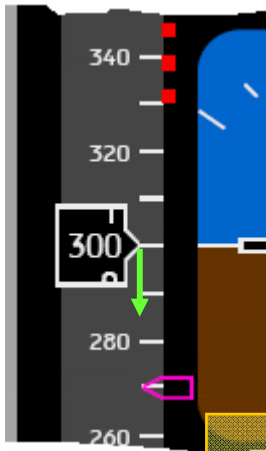
The **Terrain Profile** line represents the highest terrain within the enroute swath.





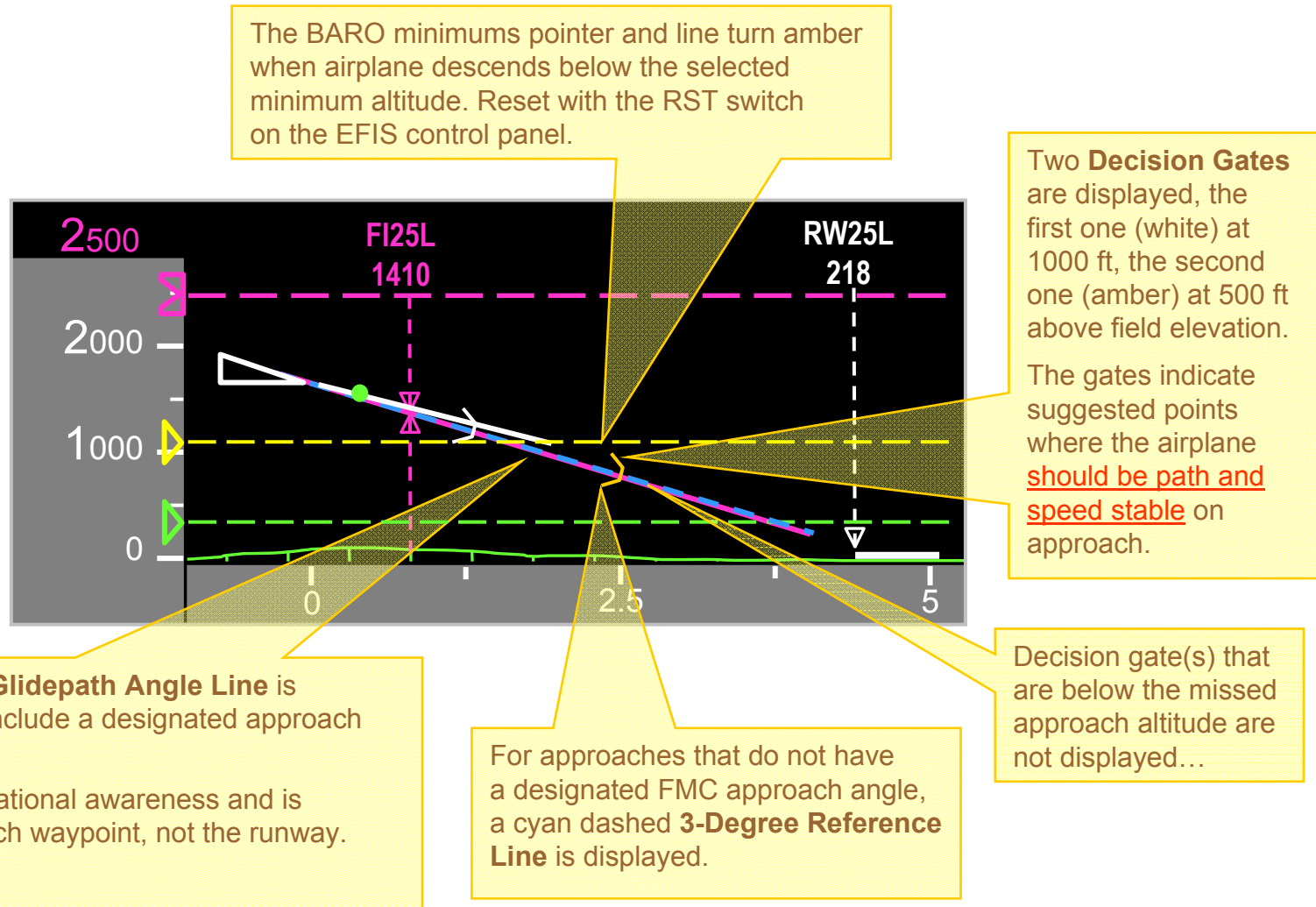


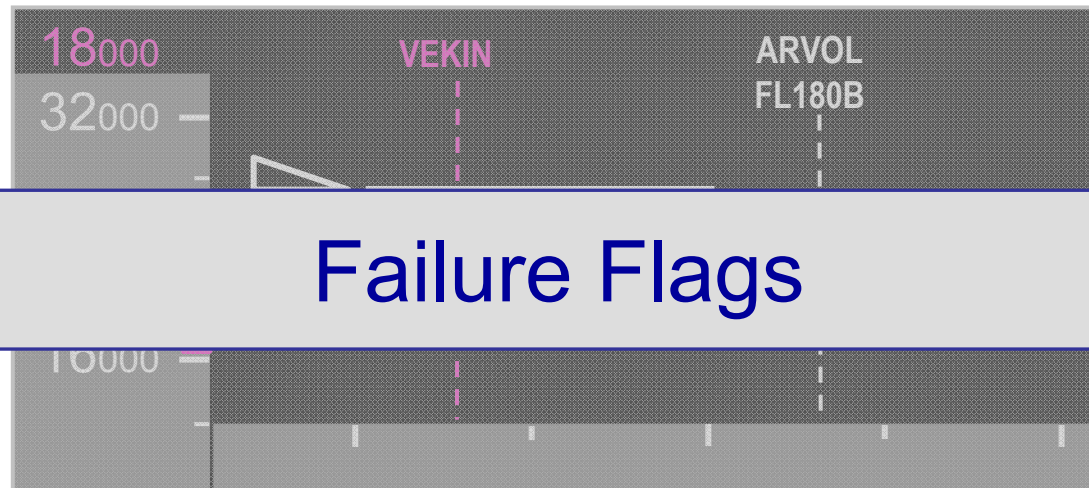
The **Range to Target Speed Dot (RTSD)** indicates where the airplane will achieve the FMC or MCP target speed, both during acceleration and deceleration. The dot is blanked when the actual speed is within 5 knots of the target speed.



In this example, the airplane will reach the target speed (270 knots) in 6 NM.

The **solid dot** is replaced with an **unfilled dot** if target speed will not be achieved within length of the vertical flight path vector line.





Failure Flags



MAP RANGE DISAGREE

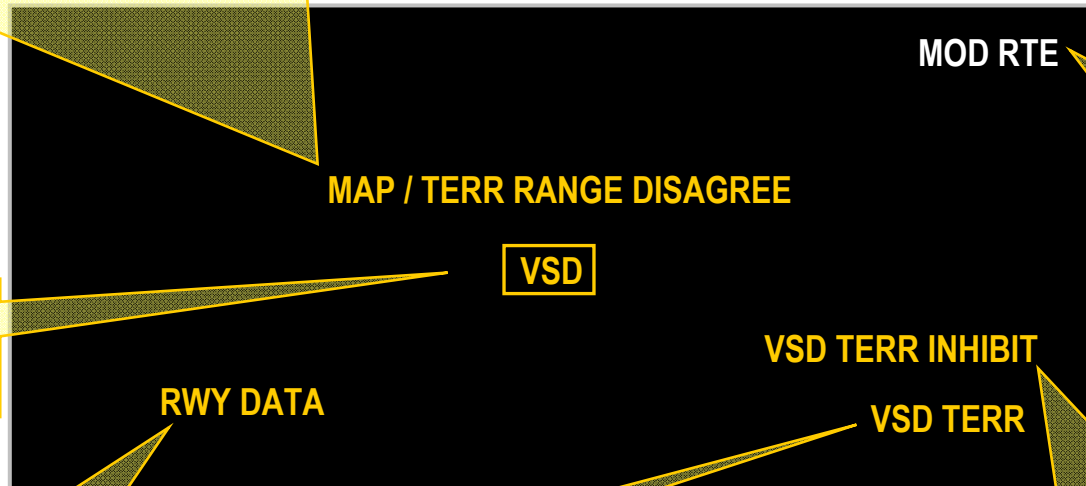
Indicates selected range on the EFIS control panel is different than the MAP display range.

TERR RANGE DISAGREE

Indicates selected range on the EFIS control panel is different than the Terrain display range.

MAP/TERR RANGE DISAGREE

Indicates selected range on the EFIS control panel is different than the MAP and Terrain display ranges.



Route Waypoints Modification Annunciation ;
FMC active route is being modified. Only the active waypoint is displayed.

VSD feature has failed, the VSD cannot be displayed.

FMC runway data is not available.

EGPWS terrain data is not available.

Annunciation is replaced with **VSD TERR INHIBIT** when GPWS control panel TERR INHIBIT switch is in the inhibit position.





*That's all,
folks*



About :

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Pat BOONE is captain on Boeing 737-767 and author of ***B737MRG.net*** - the pilot guide for B737 non-normals.