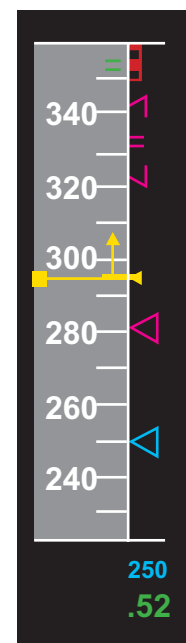
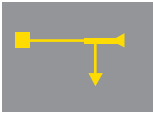

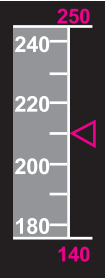


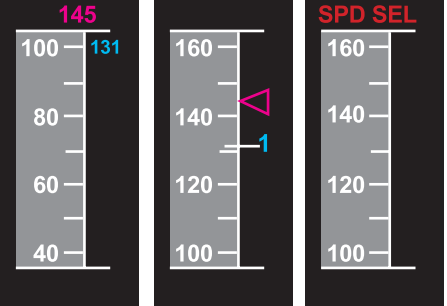
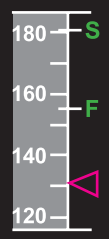
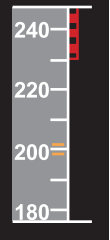
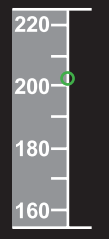


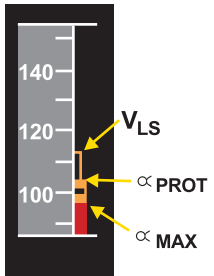
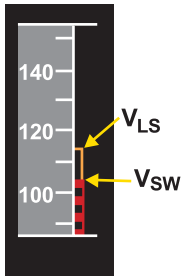
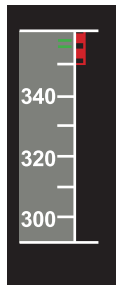
PFD AIRSPEED INDICATIONS

These airspeed indicators depict the symbols that can be displayed on the airspeed indicator. The Indication on the left depicts a low speed regime and the indication on the right depicts a high speed regime. All of the indications will not be displayed at the same time, but are shown together here for demonstration.

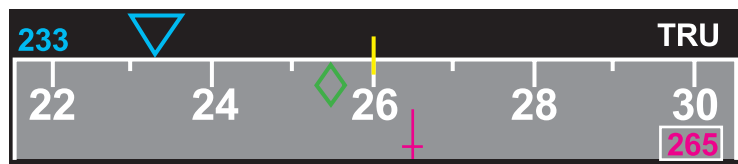


INDICATION	DESCRIPTION
	<p>The Indicated Airspeed is depicted by a yellow index line against a moving white scale on a gray background. A vertical arrow, called the speed trend arrow, indicates the aircraft's predicted speed in 10 seconds if the current acceleration or deceleration rate remains constant.</p>
	<p>Target Airspeed-Selected The Blue triangle is the FCU selected airspeed or the airspeed corresponding to the target Mach number. The numeric value is displayed above the speed scale when the selected speed is above the top of the airspeed scale and below the indicator when the selected speed is below the speed scale.</p>
	<p>Target Airspeed-Managed The Magenta triangle is the airspeed computed by the FMGC in managed speed mode or the airspeed corresponding to the target Mach number. The numeric value is displayed above the speed scale when the target speed is greater than the displayed airspeed scale range and below the indicator when the target speed is below the speed scale range.</p>
	<p>Mach Number The current Mach number is displayed below the airspeed scale when it is greater than .50.</p>

INDICATION	DESCRIPTION
	<p>Managed Descent Speed Range In DES mode and in ECON/Auto speed mode, these two half triangles replace the selected speed symbol. They show the upper and lower speed limits calculated by the FMGC. The magenta equal sign indicates the target airspeed.</p> <ul style="list-style-type: none"> The upper limit is the target speed + 20 knots, but will not exceed V_{MAX}, $V_{MO}-3$ or $M_{MO}-.006$ whichever is lowest. If a speed limit or speed constraint applies, the upper margin is limited to ECON SPD + 5 knots. The lower limit is the target airspeed - 20 knots but no lower than Green Dot, F speed, S speed or V_{LS}, whichever is higher.
	<p>Takeoff V Speeds</p> <p>Decision speed (V_1) is displayed by a blue number one on the speed scale from the speed that was entered into the MCDU. If the decision speed is off scale the numeric value will be displayed in blue near the top of the airspeed indicator.</p> <p>Takeoff safety speed (V_2) is displayed during takeoff by a magenta triangle on the speed scale from the speed that was entered into the MCDU. If V_2 is off scale the numeric value will be displayed in magenta on the top of the airspeed indicator.</p> <p>If the V speeds are not entered in the MCDU , a red “SPD SEL” message will appear on the top of the speed scale.</p>
	<p>Minimum Flap Retraction Speed A green “F” symbol is used to indicate flap retraction speed. It appears only when the flap selector is in position 3 or 2 and is the lowest speed to select flaps 1 +F.</p> <p>Minimum Slat Retraction Speed A green “S” symbol is used to indicate slat retraction speed. It appears only when the flap selector is in position 1 and is the lowest speed to select flaps 0.</p> <p>Approach Target speed or V_{APP} Target The managed speed magenta triangle indicates approach airspeed as computed by the FAC after considering V_{APP} and GS_{MINI}.</p>
	<p>Maximum Flap Extension Speed The amber “=” indicates $V_{FE\ next}$, the maximum speed corresponding the next flap lever position. It appears when the aircraft is below a preselected altitude.</p>
	<p>Green Dot Speed This green dot appears when the aircraft is flying in the clean configuration. It shows the speed corresponding to the best lift-to-drag ratio.</p>

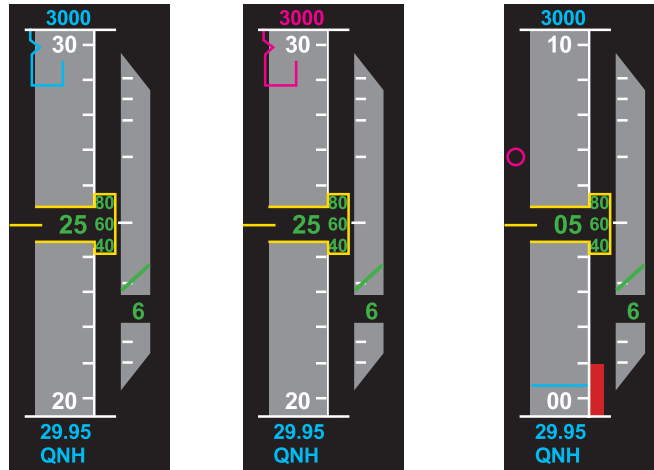
INDICATION	DESCRIPTION
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>Normal Law</p> </div> <div style="text-align: center;">  <p>Other Than Normal Law</p> </div> </div>	<p>Minimum Airspeed Limits</p> <ul style="list-style-type: none"> V_{LS} is indicated by the top of the amber line and is the lowest selectable speed. α_{PROT} or Alpha Protection Speed is indicated by the top of the black and amber strip along the speed scale. It represents the speed corresponding to the maximum angle of attack at which alpha protection becomes active. It is only displayed in normal law. α_{MAX} is the top of the solid red strip along the speed scale. It represents the speed corresponding to the maximum angle of attack that the aircraft can obtain in normal law. V_{SW} or Stall Warning Speed is the top of the red and black strip along the speed scale. It is the speed corresponding to the stall warning. It is displayed when operating any other law other than normal law.
<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>Maximum Airspeed Limits</p> <ul style="list-style-type: none"> V_{MAX} is the lower end of the red and black strip along the speed scale. It is the lowest of: <ul style="list-style-type: none"> - V_{MO} or M_{MO} - V_{LE} or - V_{FE} The green "=" sign indicates the speed at which overspeed protection becomes active. </div> </div>	

PFD Heading Indications

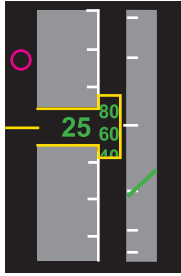
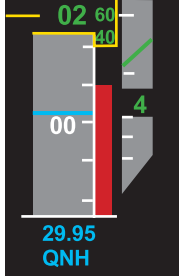
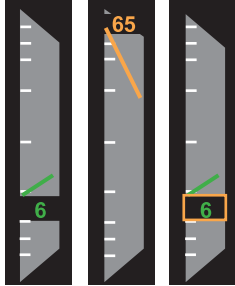




INDICATION	DESCRIPTION
	<p>Heading Reference Line</p> <ul style="list-style-type: none"> The white scale and gray background moves in front of the fixed yellow reference line to indicate actual magnetic heading. 'TRU' appears in the upper right corner of the heading indicator when the display is showing true heading instead of magnetic heading (latitude above 73° North or below 60° South).
	<p>Selected Heading or Track Index</p> <ul style="list-style-type: none"> The pointer indicates the heading or track displayed by the FCU HDG-TRK window. The index is replaced by digits on the right or left side of the scale when the selected value is off the scale.
	<p>Actual Track Symbol</p> <ul style="list-style-type: none"> The current aircraft track is displayed by this green diamond.
	<p>ILS Inbound Course</p> <ul style="list-style-type: none"> The ILS inbound course is depicted by a magenta pointer when the course is within the heading scale display range, the ILS pb is depressed and an ILS approach is selected. The ILS course is displayed numerically in magenta on the right or left side of the scale when it is outside the display range of the heading scale.
	<p>Selected Heading</p> <p>The horizon line is a moving heading scale.</p> <ul style="list-style-type: none"> The vertical lines below the scale correspond to the same 10° increments on the heading scale. The vertical line above the reference scale is the selected heading and only displays when the FD pb is off.

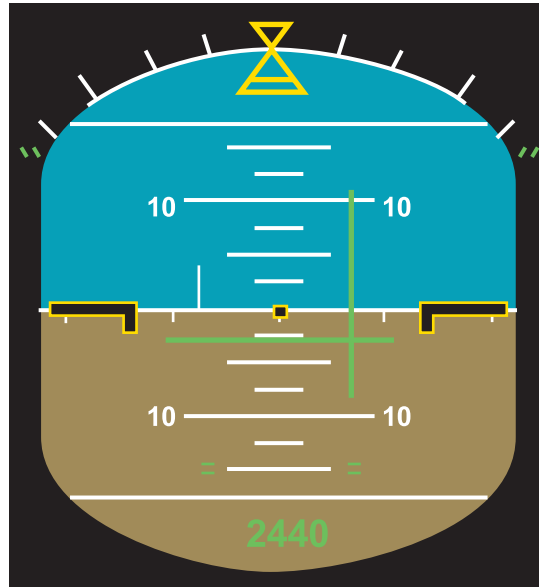
PFD Altitude Indications



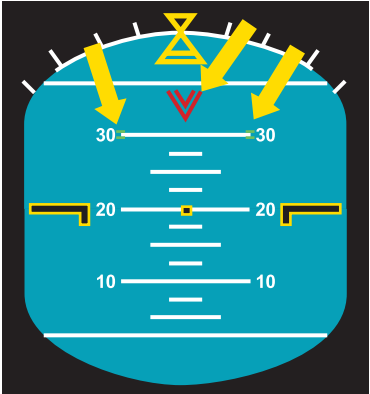


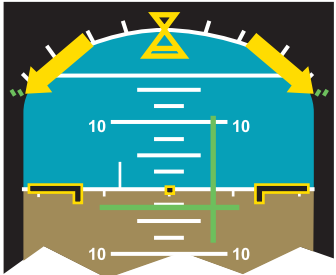
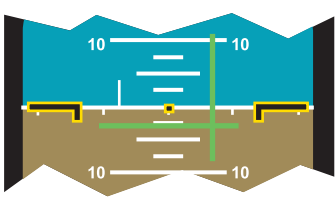
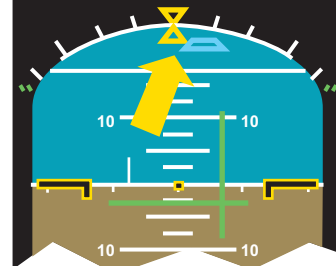
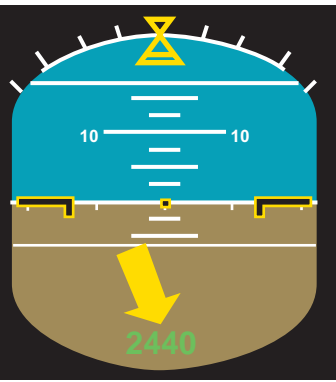
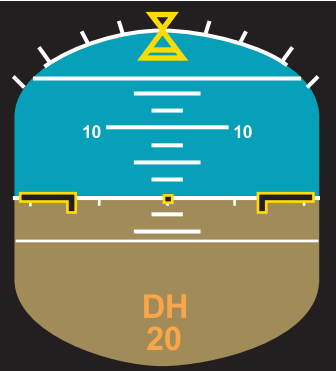
INDICATION	DESCRIPTION
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> NORMAL </div> <div style="text-align: center;"> DEVIATION </div> <div style="text-align: center;"> BELOW MDA </div> </div>	<p>Altitude Indication</p> <p>The altitude is displayed as both a white moving scale and a green digital altitude readout. The altitude window is normally yellow but will change to amber if the aircraft deviates from the FCU selected altitude.</p> <ul style="list-style-type: none"> If an MDA is set in the MCDU PERF APPR page, the altitude numbers will change to amber when the aircraft descends below the MDA.
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> 3000 </div> <div style="text-align: center;"> 3000 </div> </div>	<p>Target and Selected Altitude</p> <p>The bracket symbol indicates the aircraft will level at:</p> <ul style="list-style-type: none"> Blue-FCU selected altitude. Magenta-FMGC constrained altitude if managed CLB or DES is engaged. If the level off altitude is not displayed on the scale, a blue or magenta numeric value will be displayed above or below the scale, reflecting the direction to the altitude.
<div style="text-align: center;"> STD </div>	<p>Barometric Altimeter Reference</p> <p>The Barometric reference is displayed in blue at the bottom of the altimeter scale. The setting is selected on the FCU panel in inches of mercury (in Hg) or Hectopascals (hPa).</p> <ul style="list-style-type: none"> It displays QNH and the numeric value set when the FCU reference knob is pushed and 'STD' is displayed when the FCU reference knob is pulled for the standard 29.92 in Hg setting. The message 'STD' pulses when: <ul style="list-style-type: none"> 'STD' not selected above transition altitude. 'STD' still selected in approach below transition level or 2,500' radio altimeter if transition level is not available.

INDICATION	DESCRIPTION
	<p>Vertical Deviation</p> <p>This magenta symbol indicates the vertical profile generated by the FMGC and is displayed from the top of the descent to the final intercept point.</p> <ul style="list-style-type: none"> The VDEV can be read directly from the altitude scale. The display range of the altitude scale is approximately ± 500 feet and each line equals 100 feet. The VDEV displayed is -150 feet or 150 ft. below the vertical profile. If the VDEV exceeds the scale the symbol stays at the range limit. The MCDU PROG page displays the exact vertical deviation value.
	<p>Landing Elevation and Ground Reference</p> <ul style="list-style-type: none"> The horizontal blue bar shows the landing elevation at the flight planned destination and is displayed on approach from the 800 feet to 80 knots after landing if QNH reference mode is selected. The moving red ribbon on the right of the altitude scale represents the radio altimeter height above the field elevation and is displayed below 570 feet. When the aircraft has touched down, the top of this ribbon is at the middle of the altitude window.
	<p>Vertical Speed</p> <ul style="list-style-type: none"> The green analog pointer indicates aircraft vertical speed. Each graduated line interval indicates 500 ft/min The digital display appears when the vertical speed is greater the 200 ft/min and is incremented in hundreds of feet. The pointer and digital indication will change to amber if <ul style="list-style-type: none"> vertical speed > 6000 ft/min (climb or descent). vertical speed > 2000 ft/min during descent when RA is between 1000 and 2500. vertical speed > 1200 ft/min during descent and RA < 1000. inertial data is not available, barometric information replaces it automatically and the window around the numeric value becomes amber.
	<p>TCAS Commands</p> <p>The TCAS escapes requirements are displayed on the vertical speed indicator.</p>
	<p>TCAS Message</p> <p>The TCAS cannot deliver RA data or there is an internal TCAS failure.</p>

PFD Attitude Indications

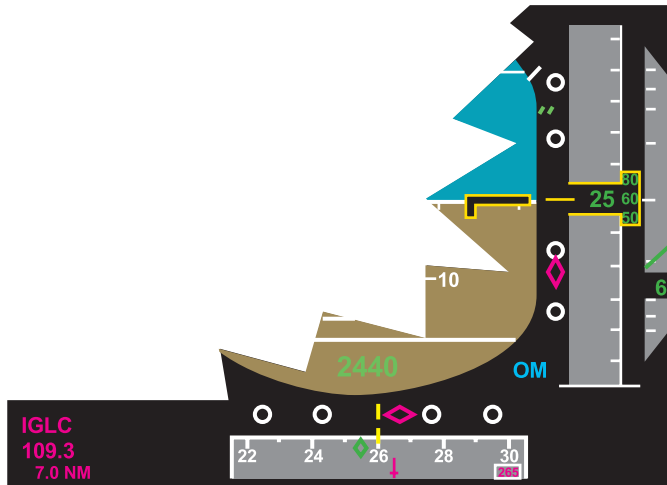



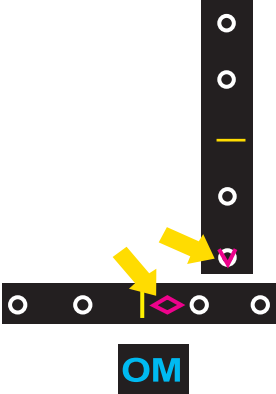



INDICATION	DESCRIPTION
	<p>Aircraft Symbol The fixed aircraft symbol is black, outlined in yellow and represents the nose and wings of the aircraft</p>
	<p>Roll Scale The white roll scale is marked at 0, 10, 20, 30, and 45 degrees of bank. The yellow roll pointer indicates bank angle.</p>
	<p>Pitch Control Protection Symbols</p> <ul style="list-style-type: none"> • The pitch angle is displayed between 80° nose up and 80° nose down, with 2.5° markers between 10° nose down and 30° nose up. • If the pitch angle exceeds 30° (nose up or down) red arrowheads will show the direction to move the nose to correct the pitch. • Pitch flight control protections are displayed as green = at 15° nose down or 30° nose up pitch. Amber x's will replace these symbols if the aircraft is in other than Normal Law.

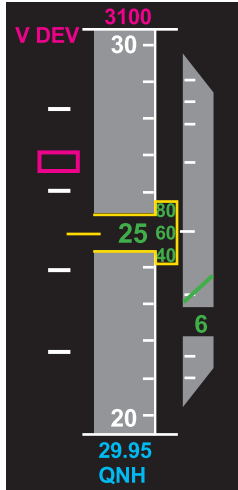
INDICATION	DESCRIPTION
	<p>Roll Control Protection Symbols The display shows these symbols in green at $\pm 67^\circ$ bank. Amber x's will replace these symbols if in other than Normal Law.</p>
	<p>Flight Director Bars</p> <ul style="list-style-type: none"> The green FD bars automatically move out of view at touchdown in ROLL OUT mode. Flash for 10 seconds and then remain steady in the following conditions: <ul style="list-style-type: none"> Reversion to the HDG V/S mode Loss of LOC or G/S in LAND mode or loss of LAND mode At the first AP/FD engagement
	<p>Sideslip Indicator/Beta Target</p> <ul style="list-style-type: none"> This trapezoidal index moves beneath the roll indicator and displays sideslip or lateral acceleration of the aircraft. In case of engine failure during takeoff or go-around, the trapezoidal index changes from the yellow sideslip indicator to a blue β target. When the index is centered with the roll index, the sideslip target equals sideslip for optimum aircraft performance (minimum drag).
	<p>Radio Altitude</p> <ul style="list-style-type: none"> Appears at altitudes below 2500 feet. The indications change every 10 feet until 50 feet radio altitude is reached, then every 5 feet down to 10 feet, then every foot. If a DH has been entered, the radio altitude will appear: <ul style="list-style-type: none"> In green until DH plus 100 feet. In amber below DH plus 100 feet. When the MCDU selected DH is reached, the letters 'DH' appear in amber above the radio altitude and flash for 3 seconds, then remain steady in amber. If 'NO' is entered for the DH in the MCDU, 0 feet becomes the reference value. If no DH is entered or both FMGCs fail, the radio height appears: <ul style="list-style-type: none"> In green above 400 feet. In amber below at or below 400 feet.
	<p>Ground Reference Line The white line located at the bottom of the altitude indicator will begin to track towards the horizon line as the aircraft approaches the ground. When the aircraft is on the ground the lower altitude indicator line will be on the horizon line. This reference displays the same information as the altitude indicator red ribbon.</p>

PFD Approach Guidance

PFD ILS Indications



INDICATION	DESCRIPTION
	<p>ILS Information</p> <p>If an ILS frequency and course is selected and the ILS/LS pb is depressed, the following information is displayed in the lower left corner of the PFD:</p> <ul style="list-style-type: none"> • ILS Identification as decoded by the ILS receiver • ILS frequency • DME distance if the ILS has a DME <p>The display of the ILS identification is an indication that a valid identification signal is being received.</p>
	<p>Localizer and Glide Slope Deviation scales</p> <ul style="list-style-type: none"> • These scales will appear when the ILS/LS pb on the EFIS control panel is selected. The deviation symbols (diamond shapes) appear when a valid signal is received. • When the localizer or glideslope is deflected full scale, half of the deviation symbol appears at the end of the scale in the direction of the localizer or glide slope. • The localizer scale will flash continuously if deviation exceeds 1/4 dot for two seconds above 15 feet RA. • The glide slope scale will flash continuously if the deviation exceeds one dot for two seconds above 100 feet RA. • The localizer and glide slope half indices flash continually when the deviation exceeds two dots for two seconds. • One dot represents a deviation of $\pm 0.8^\circ$ on the localizer scale and $\pm 0.4^\circ$ on the glide slope scale.
 	<p>Marker Beacons</p> <p>The following marker beacon signals are displayed:</p> <ul style="list-style-type: none"> • OM to indicate the outer marker • MM to indicate the middle marker, and • AWY to indicate an airway marker or the ILS inner marker beacon <p>PFD marker beacon indications are independent of the ILS/LS pb.</p>
	<p>ILS Message</p> <p>This indication will flash when the APPR mode is armed and the ILS/LS pb is not selected.</p>



RNAV Vertical Deviation Scale Index

- This symbol appears when FINAL is armed down to the DA and displays the vertical deviation from the FMGC vertical path. Each scale index represents 100 feet. If the ILS/LS pb is depressed, the glideslope index will appear and take priority over the vertical deviation index.

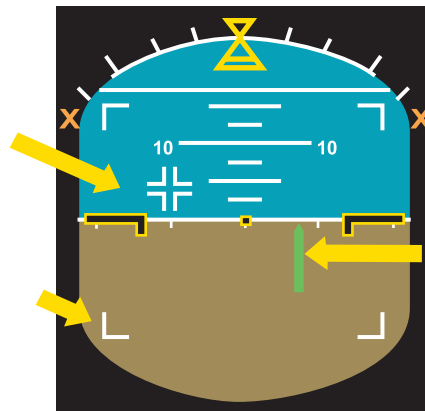
PFD Indications on the Ground

Sidestick Order Indication

This is displayed as soon as one engine is started and indicates the total of the pilot's and first officer's sidestick orders.

Max Sidestick Deflection

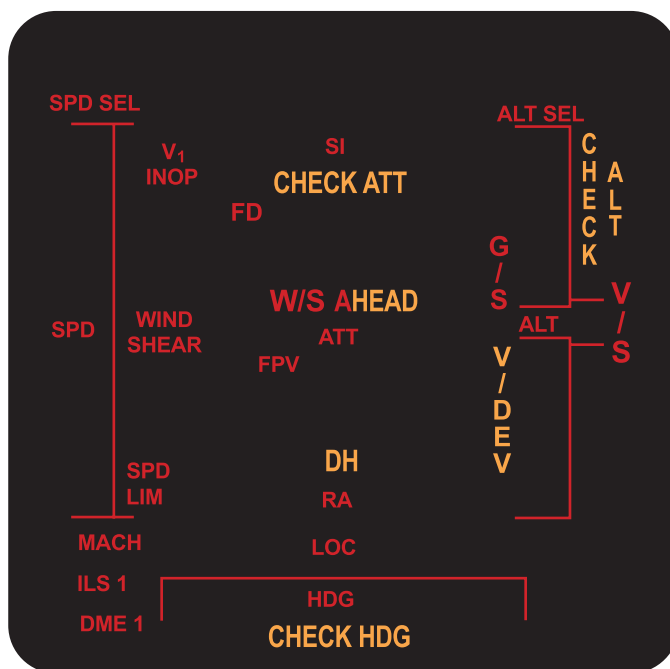
Indicated by the four white corners and is displayed after the first engine start



Ground Roll Guidance Command Bar (Yaw Bar)

This symbol is displayed below 30 feet RA provided a localizer is available, and indicates flight director yaw orders.

PFD Flags and Messages



INDICATION	DESCRIPTION
SPD SEL	Indicates failure of selected speed information
V1 INOP	Indicates V_1 signal is not valid.
SPD	SPD replaces the speed scale when speed information has failed.
WIND SHEAR	<p>The FAC has detected a reactive windshear condition:</p> <ul style="list-style-type: none"> • Reactive windshear warnings are available when slat/flaps are extended and <ul style="list-style-type: none"> - at takeoff, from 5 seconds after lift off up to 1300 feet RA. - at landing, from 1300 feet RA down to 50 feet RA. • The warning will remain displayed for at least 15 seconds following the detection and is accompanied by an aural “WINDSHEAR” warning repeated 3 times.
SPD LIM	SPD LIM appears when both FACs are inoperative. V_{LS} , S, F, Green Dot, V_{trend} , V_{max} , $V_{FE\ next}$, V_{sw} information is lost.
MACH	Indicates MACH data has failed.
ILS 1	An ILS frequency is not available or the LOC and G/S have both failed. The number following ILS will be 1 on the Captain's PFD and 2 on the First Officer's PFD.
DME 1	DME is not available. The number following DME will be 1 on the Captain's PFD and 2 on the First Officer's PFD.
SI	If the sideslip information is lost, the index disappears and a red SI flag appears.

CHECK ATT	A disagreement of at least 5° in the attitude information displayed by the two PFDs is detected. The CHECK ATT flag appears on both PFDs, and a caution appears on the ECAM.
WS AHEAD WS AHEAD	The predictive windshear system detects a windshear ahead of the aircraft. The system operates when the aircraft is below 1500 feet AGL. This message will appear in red for a warning or amber for a caution. See chapter 13 in the PH for additional information.
ATT	The PFD has lost all attitude information. The attitude sphere will disappear.
FPV	In TRK FPA mode, the drift angle or flight path angle is not valid.
DH	The aircraft has reached the selected DH.
RA	Both radio altimeters have failed. The RA flag appears in place of the radio altitude value.
LOC	The localizer receiver has failed. The LOC flag will be displayed on the LOC deviation scale.
HDG	The heading information has failed. The HDG flag replaced the heading scale.
CHECK HDG	There is a discrepancy of 5° between the Captain's and First Officer's heading indications.
ALT SEL	Selected altitude information has failed.
C H E C K A L T	The difference between the two PFD altitude indications is greater than the 250 feet when QNH is selected or 500 feet when STD is selected.
G/S	The glideslope receiver has failed. The G/S flag appears on the glideslope deviation scale.
V/DEV	The vertical deviation information has failed and the ILS/LS pb is not pressed. The V/DEV flag replaces the vertical deviation scale.
ALT	The altitude information has failed. The ALT flag replaces the altitude scale.
V/S	The vertical speed information has failed. The V/S flag replaces the vertical speed scale.
FD	Both FMGCs have failed or both FDs are disengaged and a FD pb is on and the altitude is valid.