

Learning Goals
CESSNA 172 Instruments

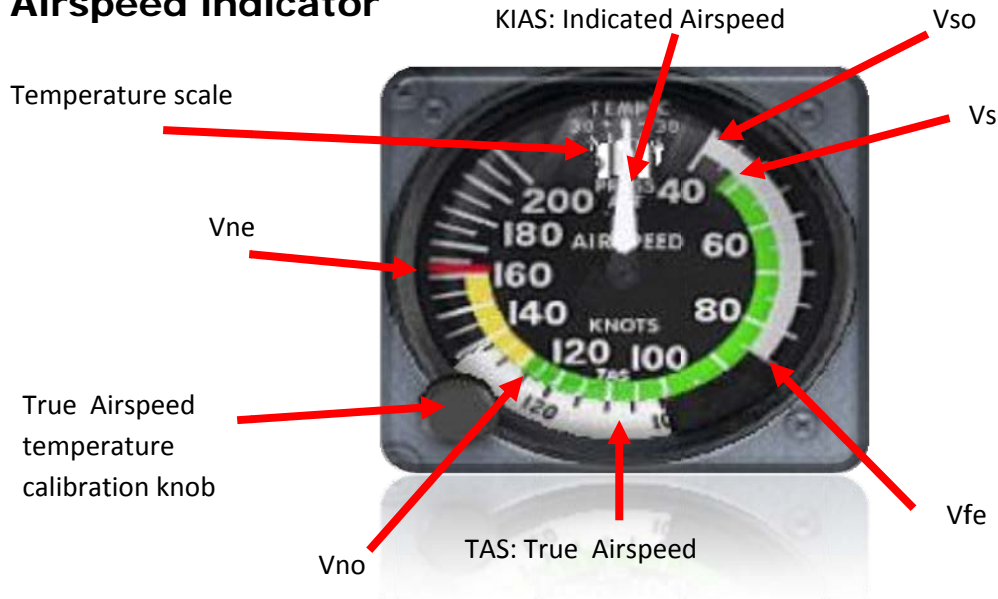
FSX



FS9



Airspeed indicator



Speeds:

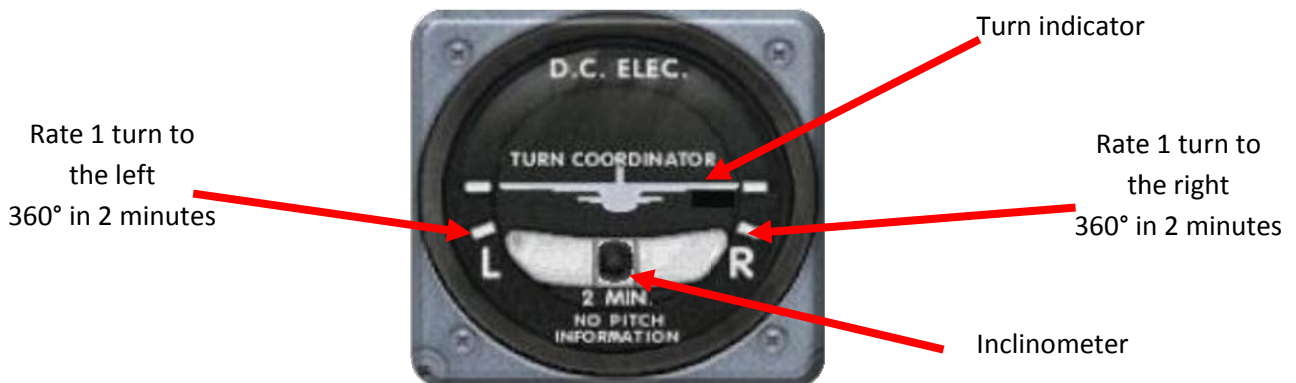
- KIAS : Indicated airspeed
- TAS : True airspeed
- Vso : Stall speed with full flaps (40 knots)
- Vs : Stall speed in clean configuration / flaps up (48 knots)
- Vfe : Max speed with Flaps extended (85 knots)
- Vno : Max normal operating speed (127 knots)
- Vne : Never exceed speed (158 knots)

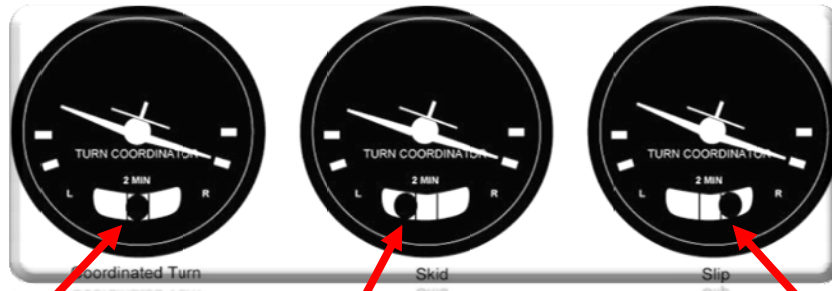
- White line : normal flaps operating range
- Green line : normal operating speed range
- yellow line : caution range , only fly in smooth air

- KIAS : indicated airspeed : speed read directly from the speed indicator
- TAS : True airspeed : speed of the aircraft relative to the airmass
- GS : Groundspeed : speed of the aircraft relative to the ground

Turn coordinator

displays to a pilot information about the rate of yaw(turn), roll, and the coordination of the turn.





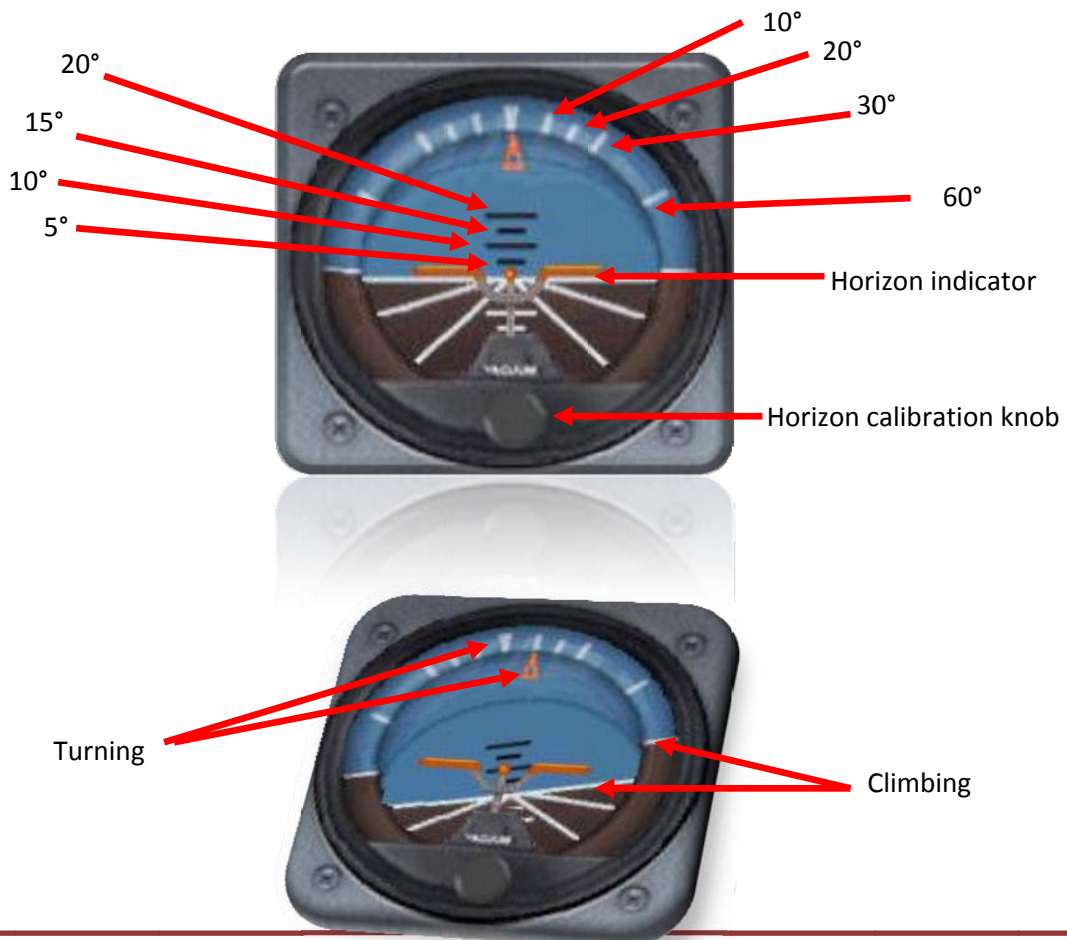
During coordinated turn the ball will remain centered

“The turn coordinator is indicating the aircraft is **skidding** in the turn (the airplane is forced outwards). In order to coordinate the turn you need to center the ball by ‘stepping on the ball’ (in this case apply left rudder

“The turn coordinator is indicating the aircraft is **slipping** in the turn (the airplane is forced inwards). In order to coordinate the turn you need to center the ball by ‘stepping on the ball’ (in this case apply right rudder

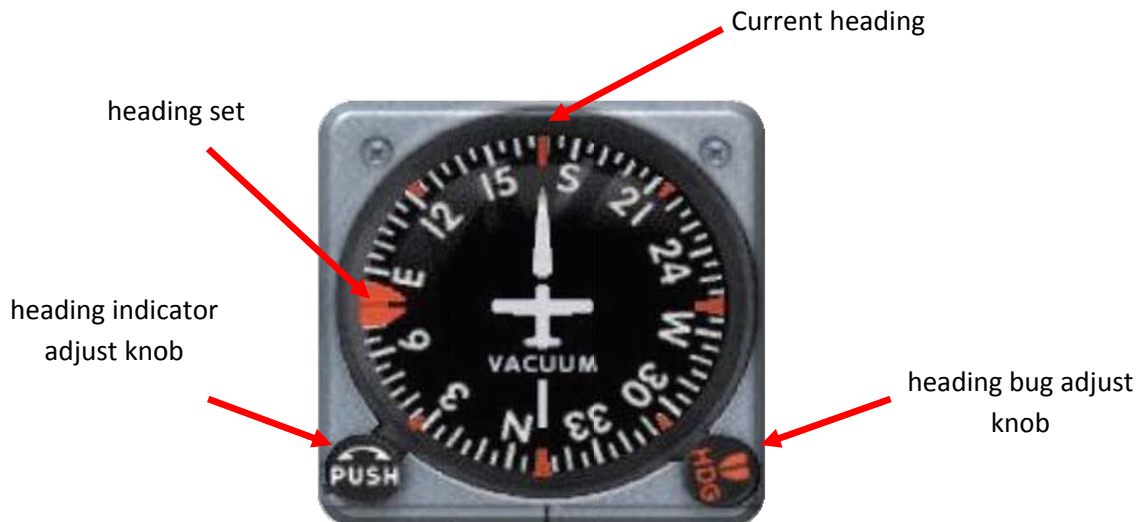
Attitude indicator

The attitude indicator is used in an aircraft to inform the pilot about the bank angle in a turn and the pitch of a climb or descend



Heading indicator

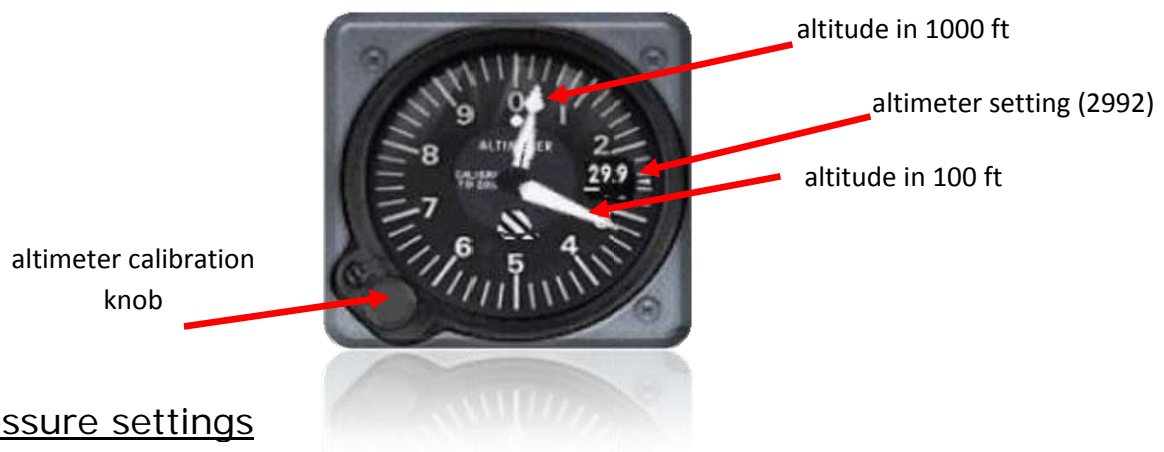
The heading indicator is used in an aircraft to inform the pilot about his heading.



Before take-off the magnetic heading CARD needs to be synchronized with your Compass with the heading indicator adjust knob. Even during flight every 15-20 min the pilot calibrates again not to drift off course

Altitude indicator

Provides the pilot information about his altitude when the barometric pressure is set correctly.



Pressure settings

Altimeter : 29.92 inches of mercury (US system)

QNH : local pressure setting in mbar or hPa (European standard)

QNH is based on sea level

QFE is based on airport level

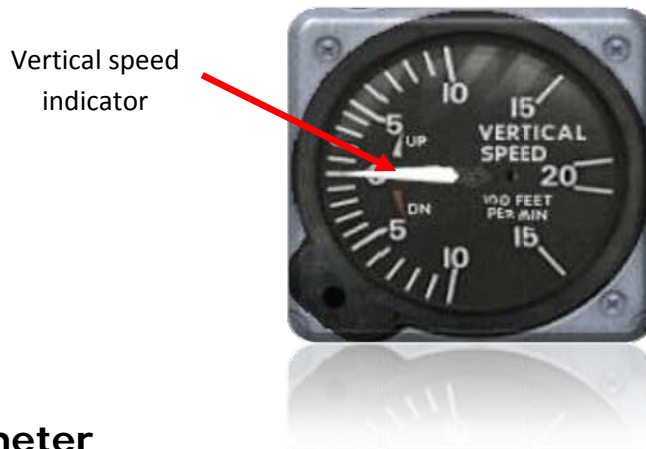
AMSL : Altitude above mean sea level (QNH)

AGL : Height above ground level (QFE = QNH - airport level)



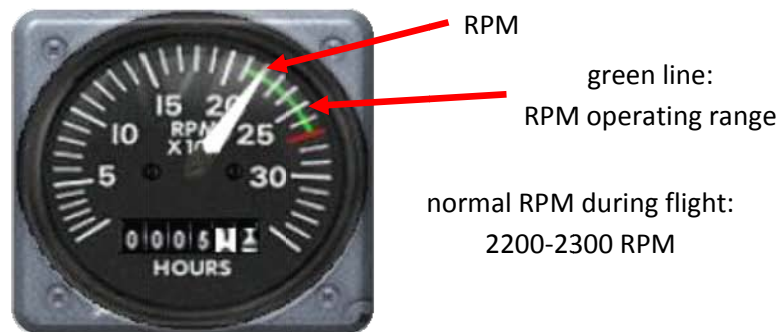
Vertical Speed indicator

provides the rate of climb or descend in hundreds of feet



Tachometer

Indicates the rotation speed of your engine in RPM (Rotations Per Minute)



RPM
green line:
RPM operating range
normal RPM during flight:
2200-2300 RPM

VOR 1 indicator

indicates your position relative to a VOR radio station
With VOR 1 you can intercept VOR radials and the glide slope of an ILS approach
VOR = **V**ery high frequency **O**mnidirectional **R**ange

CDI (Course Deviation Indicator)



Horizontal indicator

Full scale deflection = 10°
each dot represents 2°

vertical indicator
the ILS Glide slope

OBS: Omni Bearing Selector
to select VOR radials

VOR position
The VOR is somewhere in
front of us



VOR 2 indicator

indicates your position relative to a VOR radio station
With VOR 2 you can intercept VOR radials.



ADF indicator

indicates your position relative to a NDB radio station
NDB = **N**on **D**irectional **B**eacon
ADF = Automatic Direction Finder



Audio panel

You can listen to the Morse code which is send out by the station to verify you receive it correctly
(tuned in)



NAVCOM

Navigation and communication frequencies



ADF

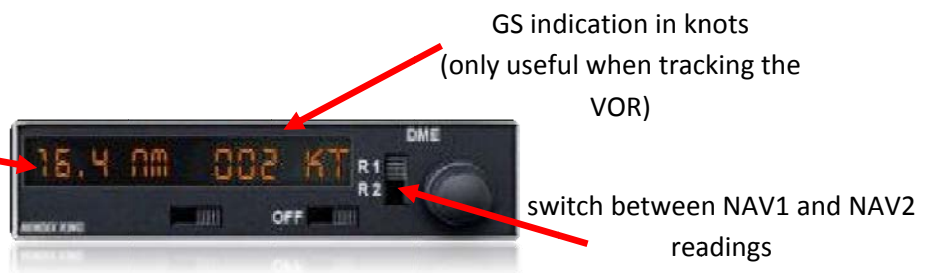
Automatic direction finder



DME

Distance Measuring Equipment

Distance to tuned DME station
(slant range)



Note:

The Slant range contains a horizontal component and a vertical component.
The Slant range indicates the straight horizontal distance when on the ground.
The Slant range indicates the altitude when exactly overhead the station



Transponder (SQUAWK)

Sends out a coded message for aircraft identification, location and distance, altitude



VFR sqwk code: 1200 in US (*uncontrolled airspace*)
VFR sqwk code: 7000 in Europe (*uncontrolled airspace*)

Throttle

With throttle you control the thrust and therefore the speed.



Flaps Placard Speeds

Flap Placard Speeds is a table which shows the maximum speeds at which flaps can be extended without causing structural damage.



Flaps	0	-
Flaps	10	110
Flaps	20	85
Flaps	30	85
	Approach Speed (Flaps up)	70-80
	Landing speed (Flaps down)	60-70

