

5. VOR, DME and basic procedures

a. VOR instrumentation

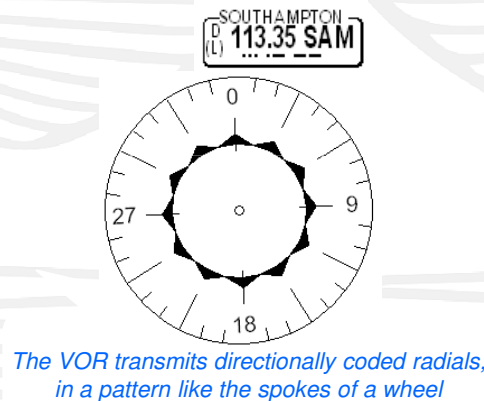
Aim	• To learn to use the VOR for both tracking and position fixing	Airmanship	• Current charts, Instrument ground checks, FREDA, S-I-D,	Performance	• To learn to track within 5° (1/2 scale deflection) & +/- 5kts, +/- 100'
-----	---	------------	---	-------------	---

Air Exercise : VOR Instrumentation

- VOR ground stations operate in the VHF band and transmit a reference-phase and a rotating-phase signal to encode direction
 - Line of sight range increases with height; approx 60nm at 2000'
 - Range nm $\approx 1.25 (\sqrt{Ht} + \sqrt{Hr})$ with *Ht, Hr in feet*
- The Course Deviation Indicator (CDI) or HSI (Horizontal Situation Indicator) is used to display VOR navigation information
 - the Omni Bearing Selector (OBS) is used to select the required radial
 - the TO/FROM flags show whether the radial selected will take you to or from the station
 - the Deviation needle moves over a scale of dots 2° apart

- Using the VOR, we can identify which radial we are on, and also intercept and track a radial
- To find out what radial from a VOR you are on
 1. tune and ident the beacon
 2. rotate the OBS to centralise the needle with the FROM flag showing
 3. read the radial above the course pointer (HSI) or at the top of the instrument (CDI)

- In this example, the aircraft is on the 180 radial from the VOR. An exact fix can be found by tuning to another VOR in range and seeing where the 2 radials cross



In a modern aircraft, a GPS NAV/COM unit may provide both Radio and GPS navigation signals. It is important that the 'Display' item in the "S-I-D" check includes the appropriate switches and annunciators, to ensure the correct source is being displayed on the instrument

