

RADIO NAVIGATION

ATPL
STUDENT
PILOT
RESUME

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ALL INFO YOU NEED TO PASS ATPL EXAMS

- PSR compared to SSR shows **only target range & bearing** but more **accurate**, however SSR consumes **less power**
- **2000**: Entering area where SSR operation **not required**
- **Errors**:
 1. **Garbling**: Replies of two or more aircraft in range of **less than 1.7NM**, same **direction/close proximity, overlap**, superposition
 2. **Fruiting**: Aeroplane at range responding to **other interrogations** from other **ATC stations**.
DEFRUITING: Removal of **random** responses from the display

RNAV

- Method of navigation using a more **direct** flight path within coverage of **station navigation aids** or within limits of **self-contained aids(INS/IRS)** or a **combination** of these, within **any** airspace or flight path, **without** requiring to **fly over** ground facilities
- **Routes**: Segments/waypoints defined as positions **lat/long** based on WGS 84
- Waypoint (**Phantom station**), **valid VOR/DME signal & desired course**
- **RNP 1/ Precision RNAV**: Accuracy **+/- 1 NM 95%** of flight time. Aircraft can **compute** an **estimate** of its **position error**
- **RNP 5/ Basic RNAV**: Accuracy **+/- 5 NM 95%** of flight time
- **AR**: Authorization required
- **2D: Horizontal**
3D: Horizontal & vertical
4D: Horizontal, vertical & time
- **5 dot HSI**:
 - **En-route**: 1 dot = **1NM**
 - **Approach**: 1 dot = **0.25NM**
 - **VOR**: 1 dot = **2°**
 - **Localiser**: 1 dot = **0.5°**
 - **Glide slope**: 1 dot = **0.14°**
- **2 dot HSI**:
 - **En-route**: 1 dot = **2NM**
 - **Approach**: 1 dot = **0.5NM**

2D RNAV

- Uses navigation **computer** which solves basic **sin/cosine trigonometry**, calculates & uses **auto** computed values, **cross track error**, **distance to go & desired course** for **tracking** on **CDI/HSI**
- **Phantom station**: A waypoint defined by **radial & distance** of a **VOR/DME**
- VOR/DME **does not** have to be in range when **entered**, but must be when in use
- **Errors**: When in **limit range** at **low altitudes** (When near DME slant range error)

4D RNAV

- **Cross track distance** is distance between **actual** position & **great circle track** between active waypoints, displayed by **ND,CDU & HSI**
- Position of waypoints entered via **Lat/long, alphanumeric ICAO identifier** or **radial & distance**
- Selection/entering of the **flight plan** can only be done **manually** by **pilot** using the **CDU**
- **Dead reckoning** mode inputs **TAS, heading & last computed W/V**, occurs when only **one VOR** information is used or when **radial** or **distance** information is **not received**
- **Wind vector** calculated from **heading** of **INS/IRS/compass system** & **TAS** from **ADC**
- **ETO**: Estimated time over significant point
- **Rho**: DME, **Theta**: VOR
- **Question tips**:

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