RADIO NAVIGATION

ATPL STUDENT PILOT RESUME

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 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: