



JEPPESEN®
BRIEFING
BULLETIN

JEP 07-A

**RNAV 1 EQUIPMENT NOTES ON U.S. RNAV STAR AND SID
PROCEDURES AND RNAV OPERATIONS ON
RNAV Q AND T ROUTES**

EFFECTIVE 15 MARCH 2007

FAA Advisory Circular (AC) 90-100A - U.S. TERMINAL AND EN ROUTE AREA NAVIGATION (RNAV) OPERATIONS - designates U.S. RNAV STAR and SID procedures as RNAV 1, and RNAV Q routes and T routes as RNAV 2, based on aircraft navigation equipment requirements. This AC reflects new performance-based navigation criteria that has been harmonized with ICAO and addresses RNAV systems using positioning inputs from GPS/GNSS and DME, and IRU. Based on current DME availability evaluations, coverage is not sufficient to support DME/DME RNAV operations without additional IRU augmentation or using GPS.

*Effective March 15, 2007, equipment notes on all affected U.S. RNAV SID and STAR procedures will be modified to reflect these new requirements. **All notes referencing Type A & B will be replaced, and AC 90-100 dated January 7, 2005 will be cancelled along with Jeppesen Briefing Bulletin JEP 05-02 dated 12 AUG 05.***

RNAV 1

Aircraft operating on RNAV 1 STARs and SIDs must maintain a total system error of not more than 1 nautical mile for 95% of the total flight time. All pilots are expected to maintain route centerlines, as depicted by onboard lateral deviation indicators and/or flight guidance during all RNAV operations unless authorized to deviate by ATC or under emergency conditions. Cross-track error/deviation should be limited to 0.5 nautical mile. Brief deviations from this standard during and immediately after procedure/route turns, up to a maximum of 1 nautical mile are allowable. Pilots must use a lateral deviation indicator (or equivalent navigation map display), flight director and/or autopilot in lateral navigation mode. RNAV 1 will appear on all U.S. RNAV STAR and SID charts. The latter includes both Standard Instrument Departures and graphic Obstacle Departure Procedures. Additional notes specifying the navigation infrastructure to support the procedure will be included (e.g., "DME/DME/IRU or GPS required").

RNAV 2

Aircraft operating on RNAV routes must maintain a total system error bounded by the RNAV value for 95% of the total flight time. All pilots are expected to maintain route centerlines, as depicted by onboard lateral deviation indicators and/or flight guidance during all RNAV operations unless authorized to deviate by ATC or under emergency conditions. Cross-track error/deviation should be limited to 1.0 nautical mile. Brief deviations from this standard during and immediately after procedure/route turns, up to a maximum of 2.0 nautical miles are allowable. RNAV 2 will be used for enroute operations unless otherwise specified. Pilots are encouraged to use a lateral deviation indicator (or equivalent navigation map display), flight director and/or autopilot in lateral navigation mode. RNAV 2 applies to Q-routes and T-routes in the U.S. It *does not apply* to over-water RNAV routes (including Q-routes in the Gulf of Mexico and the Atlantic routes) or VOR DME RNAV routes in Alaska as well as off-route RNAV operations, Alaska GPS routes, or Caribbean routes.

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(Continued)

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ELIGIBILITY

The following systems meet many of the requirements defined in this AC. Such equipment still requires evaluation by the manufacturer against all the functional and performance requirements in this Advisory Circular. Relevant documentation acceptable to the FAA must be available to establish that the aircraft is equipped with RNAV systems meeting RNAV 1 or RNAV 2 requirements. A current list of compliant equipment is available at the AFS-410 Website: http://www.faa.gov/about/office_org/headquarters_offices/avs/offices/afs/afs400/afs410/policy_guidance/

- Aircraft with TSO-C129/C129a sensor (Class B or C) and the requirements in a TSO-C115b FMS, installed for IFR use in accordance with AC 20-130A.
- Aircraft with TSO-C145a sensor, and the requirements in a TSO-C115b FMS, installed for IFR use in accordance with AC 20-130A or AC 20-138A.
- Aircraft with TSO-C129/C129a sensor Class A1 (without deviating from the required functionality for Navigation Displays and Functions included in Appendix 3 of AC 90-100A) installed for IFR use in accordance with AC 20-138 or AC 20-138A.
- Aircraft with TSO-C146a sensor (without deviating from the required functionality for Navigation Displays and Functions included in Appendix 3 of AC 90-100A) installed for IFR use in accordance with AC 20-138A.
- The RAIM prediction program should comply with the criteria in AC 20-138A, paragraph 12.

Aircraft with P-RNAV approval based on GNSS capability meet the functional requirements of AC 90-100A.

Unless the RNAV route or STAR or SID procedure specifically requires GPS or GNSS equipage, aircraft must be within ATC radar surveillance and communication while on the route or procedure. For procedures requiring GPS and/or aircraft approvals requiring GPS, if the navigation system does not automatically alert the flight crew of a loss of GPS, the operator must develop procedures to verify correct GPS operation.

Examples

STAR Old (Type B)

26 AUG 05 **10-2E** **Eff 1 Sep**

Alt Set: INCHES Trans level: FL180 Trans alt: 18000'
1. DME/DME/IRU or GPS required.
2. Pilots of RNP-capable aircraft, use RNP 2.0.
3. Type B.
4. RADAR required.

New (RNAV 1)

9 MAR 07 **10-2E** **Eff 15 Mar**

Alt Set: INCHES Trans level: FL180 Trans alt: 18000'
1. DME/DME/IRU or GPS required.
2. RNAV 1
3. RADAR required.

SID Old (Type B)

28 JUL 06 **10-3D** **Eff 3 Aug**

Trans level: FL180 Trans alt: 18000'
1. DME/DME/IRU, or GPS required.
2. Pilots of RNP-capable aircraft, use RNP 2.0.
3. Type B. 4. RADAR required.
5. For non-GPS equipped aircraft departing Rwys 25L/R, SLI must be operational.
6. Rwys 24L/R departures EXPECT RADAR vectors to PEVEE prior to NAANC.
7. Rwys 6L/R, 7L/R: Not authorized by ATC.

New (RNAV 1)

9 MAR 07 **10-3D** **Eff 15 Mar**

Trans level: FL 180 Trans alt: 18000'
1. DME/DME/IRU, or GPS required.
2. Radar required.
3. RNAV 1.
4. For non-GPS equipped aircraft departing rwy 25L/R, SLI must be operational.
5. Rwys 24L/R departures EXPECT Radar vectors to PEVEE prior to NAANC.
6. Rwys 6L/R, 7L/R: Not authorized by ATC.

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