

3. An operational service volume has been established for each class in which adequate signal coverage and frequency protection can be assured. To facilitate use of VOR, VORTAC, or TACAN aids, consistent with their operational service volume limits, pilot use of such aids for defining a direct route of flight in controlled airspace should not exceed the following:

(a) Operations above FL 450 – Use aids not more than 200 NM apart. These aids are depicted on enroute high altitude charts.

(b) Operation off established routes from 18,000 feet MSL to FL 450 – Use aids not more than 260 NM apart. These aids are depicted on enroute high altitude charts.

(c) Operation off established airways below 18,000 feet MSL – Use aids not more than 80 NM apart. These aids are depicted on enroute low altitude charts.

(d) Operation off established airways between 14,500 feet MSL and 17,999 feet MSL in the conterminous U.S. – (H) facilities not more than 200 NM apart may be used.

4. Increasing use of self-contained airborne navigational systems which do not rely on the VOR/VORTAC/TACAN system has resulted in pilot requests for direct routes that exceed NAVAID service volume limits. With the exception of GNSS-equipped aircraft, these direct route requests will be approved only in a radar environment, with approval based on pilot responsibility for navigation on the authorized direct route. Radar flight following will be provided by ATC for ATC purposes. For GNSS-equipped aircraft, ATC may approve a direct route that exceeds ground based NAVAID service volume limits; however, in a non-radar environment, the routing must be “point-to-point,” defined as navigation from a published point to a published point, and navigational assistance will not be available. (See subparagraph 5-1-8d below.)

5. At times, ATC will initiate a direct route in a radar environment that exceeds NAVAID service volume limits. In such cases ATC will provide radar monitoring and navigational assistance as necessary. For GNSS-equipped aircraft, if the route is point-to-point, radar monitoring and navigational assistance is not required. (See subparagraph 5-1-8d below.)

6. Airway or jet route numbers, appropriate to the stratum in which operation will be conducted, may also be included to describe portions of the route to be flown.

**EXAMPLE–**

*MDW V262 BDF V10 BRL STJ SLN GCK  
Spelled out: from Chicago Midway Airport via Victor 262 to Bradford, Victor 10 to Burlington, Iowa, direct St. Joseph, Missouri, direct Salina, Kansas, direct Garden City, Kansas.*

**NOTE–**

*When route of flight is described by radio fixes, the pilot will be expected to fly a direct course between the points named.*

7. Pilots are reminded that they are responsible for adhering to obstruction clearance requirements on those segments of direct routes that are outside of controlled airspace. The MEAs and other altitudes shown on low altitude IFR enroute charts pertain to those route segments within controlled airspace, and those altitudes may not meet obstruction clearance criteria when operating off those routes.

**d. Area Navigation (RNAV)/Global Navigation Satellite System (GNSS)**

1. Except for GNSS-equipped aircraft, random impromptu routes can only be approved in a radar environment. A random impromptu route is a direct course initiated by ATC or requested by the pilot during flight. Aircraft are cleared from their present position to a NAVAID, waypoint, fix, or airport. Factors that will be considered by ATC in approving random impromptu routes include the capability to provide radar monitoring and compatibility with traffic volume and flow. ATC will radar monitor each flight; however, navigation on the random impromptu route is the responsibility of the pilot. GNSS-equipped aircraft are allowed to operate in a non-radar environment when the aircraft is cleared via, or is reported to be established on, a point-to-point route. The points must be published NAVAIDs, waypoints, fixes, or airports recallable from the aircraft's database. The distance between the points cannot exceed 500 miles and navigational assistance will not be provided.

2. Pilots of aircraft equipped with approved area navigation equipment may file for RNAV routes throughout the National Airspace System and may be filed for in accordance with the following procedures.

(a) File airport-to-airport flight plans.