CHAPTER 17. ENROUTE CRITERIA

1700.-1709. RESERVED.

Section 1. VHF Obstacle Clearance Areas

1710. ENROUTE OBSTACLE CLEARANCE AREAS. Obstacle clearance areas for enroute planning are identified as "primary," "secondary," and "turning" areas.

1711. PRIMARY AREAS.

a. Basic Area. The primary enroute obstacle clearance area extends from each radio facility on an airway or route to the next facility. It has a width of 8 NM; 4 NM on each side of the centerline of the airway or route. See Figure 17-1.

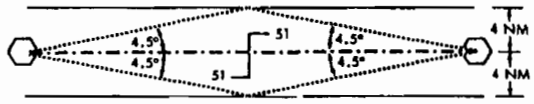

Figure 17-1 PRIMARY OBSTACLE CLEARANCE AREA
Par 1711 a.

b. System Accuracy. System accuracy lines are drawn at a 4.5 degree angle on each side of the course or route. See Figure 17-1. The apexes of the 4.5 degree angles are at the facility. These system accuracy lines will intersect the boundaries of the primary area at a point 50.8 NM from the facility. (Normally 51 NM is used.) If the distance from the facility to the changeover point (COP) is more than 51 NM, the outer boundary of the primary area extends beyond the 4 NM width along the 4.5 degree line. See Figure 17-2. These examples apply when the COP is at midpoint. Paragraph 1716 covers the effect of offset COP or dogleg segments.

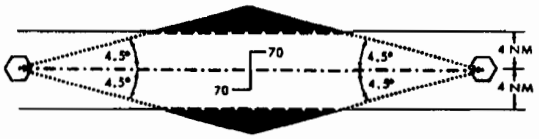

Figure 17-2. PRIMARY OBSTACLE CLEARANCE AREA.
Application of System Accuracy. Par 1711 b.

c. Termination Point. When the airway or route terminates at a navigational facility or other radio fix, the primary area extends beyond that termination point. The boundary of the area may be defined by an arc which connects the two boundary lines. The center of the arc is, in the case of a facility termination point, located at the geographic location of the facility. In the case of a termination at a radial or DME fix, the boundary is formed by an arc with its center located at the * most distant point of the fix displacement area on * course line. Figure 17-8 and its inset show the construction of the area at the termination point.

1712. SECONDARY AREAS.

a. Basic Area. The secondary obstacle clearance area extends along a line drawn 2 NM on each side of the primary area. See Figure 17-3.

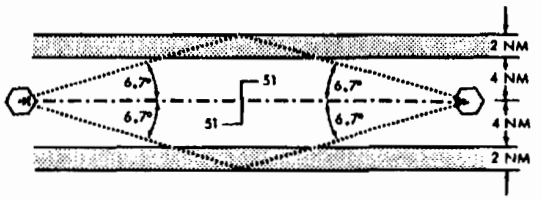

Figure 17-3. SECONDARY OBSTACLE CLEARANCE AREAS.
Par 1712.a.

b. System Accuracy. Secondary area system accuracy lines are drawn at a 6.7 degree angle on

each side of the course or route. See Figure 17-3. The apexes are at the facility. These system accuracy lines will intersect the outer boundaries of the secondary areas at the same point as primary lines, 51 NM from the facility. If the distance from the facility to the COP is more than 51 NM, the secondary area extends along the 6.7 degree line. See Figure 17-4. See paragraph 1716.c. and d. for offset COP or dogleg airway.

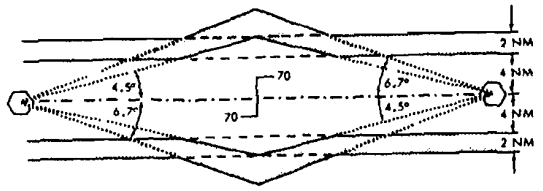

Figure 17-4 SECONDARY OBSTACLE CLEARANCE AREAS. Application of System Accuracy Lines. Par 1712 b

c. Termination Point. Where the airway or route terminates at a facility or radio fix the boundaries are connected by an arc in the same way as those in the primary area. Figure 17-8 and its inset shows termination point secondary areas.

1713. TURNING AREA.

a. Definition. The enroute turning area may be defined as an area which may extend the primary and secondary obstacle clearance areas when a change of course is necessary. The dimensions of the primary and secondary areas will provide adequate protection where the aircraft is tracking along a specific radial, but when the pilot executes a turn, the aircraft may go beyond the boundaries of the protected airspace. The turning area criteria supplements the airway and route segment criteria to protect the aircraft in the turn.

b. Requirement for Turning Area Criteria. Because of the limitation on aircraft indicated airspeeds below 10,000 feet MSL (FAR 91.70), some conditions do not require the application of turning area airspace criteria.

(1) The graph in Figure 17-5 may be used to determine if the turning area should be plotted for airways/routes below 10,000 feet MSL. If the point of intersection on the graph of the "amount of turn at intersection" versus "VOR facility to intersection distance" falls outside the hatched area of the graph, the turning area criteria need not be applied.

(2) If the "amount of turn" versus "facility distance" values fall within the hatched area or outside the periphery of the graph, then the turning area criteria must be applied as described in paragraph 1714.

c. Track. The flight track resulting from a combination of turn delay, inertia, turning rate, and wind effect is represented by a parabolic curve. For ease of application, a radius arc has been developed which can be applied to any scale chart.

d. Curve Radii. A 250 knot IAS, which is the maximum allowed below 10,000 feet MSL, results in radii of 2 NM for the primary area and 4 NM for the secondary area up to that altitude. For altitudes above 10,000 feet MSL up to but not including 18,000 feet MSL the primary area radius is 6 NM and the secondary area radius is 8 NM. Above 18,000 feet MSL the radii are 11 NM for primary and 13 NM for secondary. TIL01-025

e. System Accuracy. In drawing turning areas it will be necessary to consider system accuracy factors by applying them to the most adverse displacement of the radio fix or airway/route boundaries at which the turn is made. The 4.5 and 6.7 degree factors apply to the VOR radial being flown, but since no pilot or aircraft factors exist in the measurement of an intersecting radial, a navigation facility factor of plus-or-minus 3.6 degrees is used. See Figure 17-6.

NOTE: If a radio fix is formed by intersecting signals from two LF, or one LF and VOR facility, the obstacle clearance areas are based upon accuracy factors of 5.0 (primary) and 7.5 (secondary) degrees each side of the course or route centerlines of the LF facilities. If the VOR radial is the intersecting signal, the 3.6 degree value stated in 1713.e. above applies.