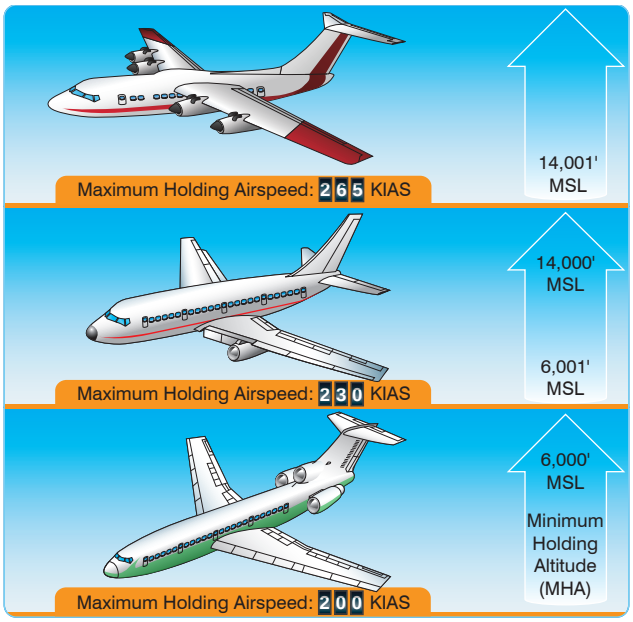

Figure 2-73. Maximum holding speeds for different altitudes.

17,000 feet at the VOR. When the altitude alerter sounded, the pilot advised Center that we were leaving FL 310. ATC acknowledged with a "Roger." At FL 270, Center questioned the pilot about the aircrafts descent. The pilot told the controller that the reason for the descent was to cross the VOR at 17,000 feet. ATC advised the pilot that he did not have clearance to descend. What the pilot thought was a clearance was in fact an "expect" clearance. Whenever pilots are in doubt about a clearance it is imperative they request clarity from ATC. Also, the term "Roger" only means that ATC received the transmission, not that they understood the transmission. "Expect" altitudes are published for planning purposes and are not considered crossing restrictions until verbally issued by ATC.

En Route Holding Procedures

The criteria for holding pattern airspace is developed both to provide separation of aircraft, as well as obstacle clearance. The alignment of holding patterns typically coincides with the flight course you fly after leaving the holding fix. For level holding, a minimum of 1,000 feet obstacle clearance is provided throughout the primary area. In the secondary area, 500 feet of obstacle clearance is provided at the inner edge, tapering to zero feet at the outer edge. Allowance for precipitous terrain is considered, and the altitudes selected for obstacle clearance may be rounded to the nearest 100 feet. When criteria for a climb in hold are applied, no obstacle penetrates the holding surface. [Figure 2-70]

There are many factors that affect aircraft during holding maneuvers, including navigational aid ground and airborne tolerance, effect of wind, flight procedures, application of ATC, outbound leg length, maximum holding airspeeds, fix to NAVAID distance, DME slant range effect, holding airspace size, and altitude holding levels.

ATC Holding Instructions

When controllers anticipate a delay at a clearance limit or fix, pilots are usually issued a holding clearance at least five minutes before the ETA at the clearance limit or fix. If the holding pattern assigned by ATC is depicted on the appropriate aeronautical chart, pilots are expected to hold as charted. In the following example, the controller issues a holding clearance that includes the name of the fix, directs the pilot to hold as charted, and includes an expect further clearance (EFC) time. "Marathon five sixty four, hold east of MIKEY Intersection as published, expect further clearance at 1521."

When ATC issues a clearance requiring you to hold at a fix where a holding pattern is not charted, pilots are issued complete holding instructions. The holding instructions include the direction from the fix, name of the fix, course, leg length, if appropriate, direction of turns (if left turns are required), and the EFC time. Pilots are required to maintain the last assigned altitude unless a new altitude is specifically included in the holding clearance and should fly right turns unless left turns are assigned. Note that all holding instructions should include an EFC time. In the event that two-way radio communication is lost, the EFC allows the pilot to depart the holding fix at a definite time. Pilots should plan the last lap of the holding pattern to leave the fix as close as possible to the exact time. [Figure 2-71]

When approaching the clearance limit and you have not received holding instructions from ATC, pilots are expected to follow certain procedures. First, call ATC and request further clearance before reaching the fix. If further clearance cannot be obtained, pilots are expected to hold at the fix in compliance with the charted holding pattern. If a holding pattern is not charted at the fix, pilots are expected to hold on the inbound course using right turns. This procedure ensures that ATC provides adequate separation. [Figure 2-72] For example, the aircraft is heading eastbound on V214 and the Cherrelyn VORTAC is the clearance limit and the pilot has not been able to obtain further clearance and has not received holding instructions, plan to hold southwest on the 221° radial using left-hand turns, as depicted. If this holding pattern is not charted, hold west of the VOR on V214 using right-hand turns.

Where required for aircraft separation, ATC may request that the pilot hold at any designated reporting point in a