

VOR HOLDS

HOLDING INSTRUCTIONS

EXAMPLE INSTRUCTIONS: Hold East of the SLI VOR on the 090° radial (Assume you are inbound on the 240° radial)

- Hold East means that the hold itself will be to the East side of the holding fix (the SLI VOR)
- Hold on the 090° radial implies that the 090° radial is the inbound leg of the hold
- Since no turns are specified in the instructions, right turns are implied (right turns are standard in a hold)

DRAWING THE HOLD

1. Draw the holding fix

Draw the SLI VOR or fix assigned in the instructions.

2. Draw the inbound leg of the hold

The inbound leg is the radial given in the holding instructions (the 090° radial). *The inbound leg always goes to the holding fix, never away from the fix.* Draw an arrow on the inbound leg pointing toward the holding fix.

3. Find the inbound leg heading

This is the heading actually flown on the inbound leg. It will be the reciprocal of the radial you are on. In this case, on the inbound leg, you will fly West, on a 270° heading.

4. Draw the turn after the inbound leg

From the holding fix, draw a 180° turn to the left or the right per the instructions. Right turns are standard.

5. Draw the outbound leg and complete the final turn

The outbound leg will parallel the inbound leg. Draw an arrow in the direction of flight. Finally, complete the hold with the 180° turn back to the inbound leg.

6. Find the outbound leg heading

The outbound leg heading will be the reciprocal of the inbound leg. Always double check each heading to ensure it makes sense based on the direction.

7. Ensure the hold is correct

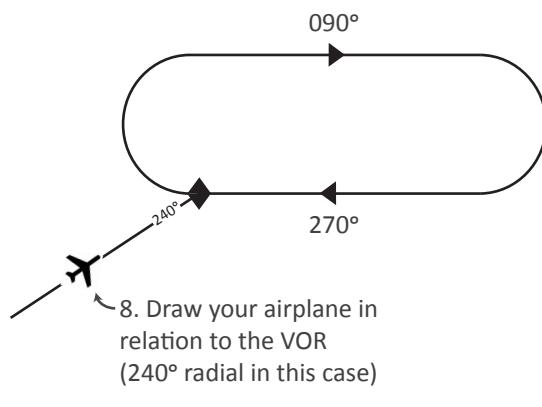
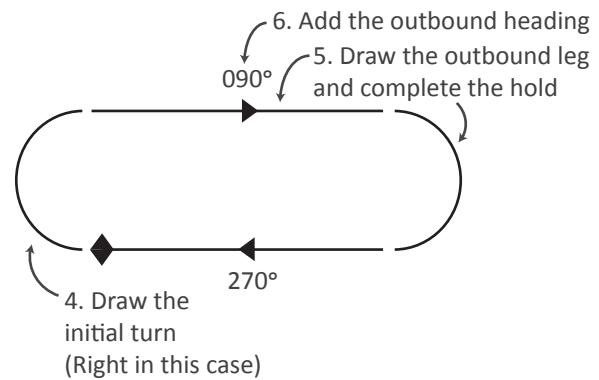
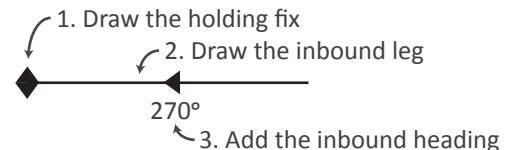
As mentioned above, the hold should be to the East of the VOR, the turns should be to the right and the inbound leg should be the 090° radial of the GRE VOR.

8. Figure out where you are in relation to the holding fix

Use your VOR to figure out which radial you are currently on. Draw the radial in relation to the VOR.

9. Decide which entry is appropriate

See 'Hold Entries' page. This would be a teardrop entry, after crossing the holding fix, you would fly 060° for 1 minute then turn to intercept the inbound leg.



Intersection Holds

HOLDING INSTRUCTIONS

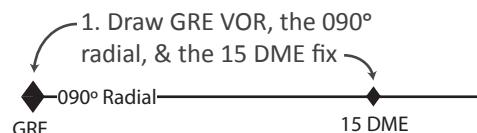
EXAMPLE INSTRUCTIONS: Hold West of the 15 DME fix on the GRE VOR 090° radial, left turns.

- Hold on the 090° radial implies that the 090° radial is the inbound leg of the hold
- Hold West means that the hold itself will be to the West side of the holding fix (the 15 DME of the 090° radial)
- In this case left turns are specified

DRAWING THE HOLD

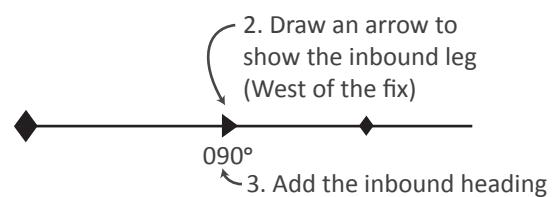
1. Draw the holding fix

Draw the GRE VOR as well as the fix (090° radial 15 DME)



2. Draw the inbound leg of the hold

The inbound leg is the radial given in the holding instructions (090°). But, the inbound leg could be on either side of the fix. The instructions state to hold WEST of the fix. Therefore, the inbound leg is on the left (West) of the fix. Use an arrow to show the leg. (If you were told to hold East, the inbound leg would be on the right of the fix)



3. Find the inbound leg heading

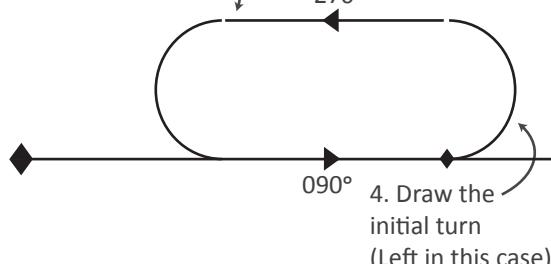
This is the heading actually flown on the inbound leg. In this case, you will fly East, on a 090° heading.

4. Draw the turn after the inbound leg

From the holding fix, draw a 180° turn to the left or the right per the instructions. Right turns are standard.

5. Draw the outbound leg and complete the hold

6. Add the outbound heading



5. Draw the outbound leg and complete the final turn

The outbound leg will parallel the inbound leg. Draw an arrow in the direction of flight. Finally, complete the hold with the 180° turn back to the inbound leg.

6. Find the outbound leg heading

The outbound leg heading will be the reciprocal of the inbound leg.

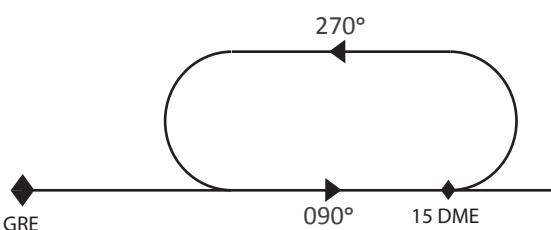
6. Add the outbound heading

7. Ensure the hold is correct

The hold should be to the West of the 15 DME fix, the turns should be to the left and the inbound leg should be on the 090° radial of the VOR.

8. Figure out where you are in relation to the holding fix

Use your VOR to figure out which radial you are currently on. Draw the radial in relation to the VOR.



9. Decide which entry is appropriate

See 'Hold Entries' page

HOLD ENTRIES - AIM 5-3-8

Depending on the direction you are flying when you cross the holding fix, there are three different entries. You can mathematically decide which entry is appropriate based on the 70° arcs drawn in the box below, or use the entry that makes sense:

DIRECT ENTRY

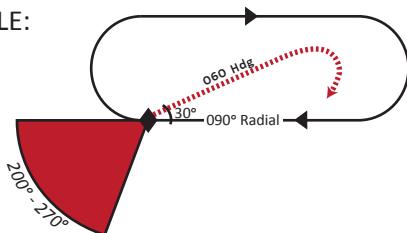
When approaching the holding fix from anywhere in the grey sector (radials 020 - 200, in this case), the direct entry procedure would be to fly directly to the fix and turn to follow the holding pattern.

EX: Upon crossing the VOR, turn right as depicted to a 090° heading for the outbound leg.

TEARDROP ENTRY

When approaching the holding fix from anywhere in the red sector, the teardrop entry is applicable. In simpler terms, *when you cross the holding fix, if you are on a heading opposite the inbound leg and that will take you inside the hold, the teardrop entry applies*. The teardrop entry procedure would be to fly to the fix, turn 30° into the holding pattern for a period of one minute, then turn in the direction of the holding pattern to intercept the inbound course.

EXAMPLE:

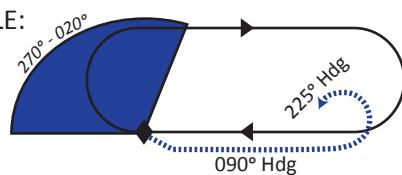


If you are approaching the holding fix on any heading in the red sector (radials 200 - 270, in this case), upon crossing the VOR, turn to a heading that is 30° from the inbound leg of the hold. In this case, 30° from the 090° radial results in a heading of 060° . Fly a heading of 060° for 1 minute, then turn right to intercept the inbound course (270°).

PARALLEL ENTRY

When approaching the holding fix from anywhere in the blue sector, the parallel entry would be to fly a heading that will parallel the inbound leg for 1 minute, then turn in the direction of the holding pattern through more than 180° , and return to the holding fix or intercept the inbound course. In simpler terms, *if you cross the holding fix on a heading opposite the inbound leg, and that will take you outside of the hold the parallel entry applies*. After paralleling the inbound leg for 1 minute, a common rule is to turn 225° to intercept the inbound leg.

EXAMPLE:

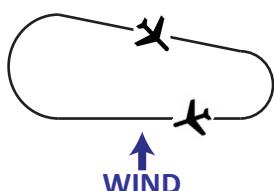


If you are approaching the holding fix on any heading in the blue sector (radials 270 - 020, in this case), upon crossing the VOR turn to a 090° heading to parallel the inbound leg for 1 minute. Then, start a 225° turn to intercept the inbound leg. In this case you will turn left, coincidentally to a heading of 225° until you intercept the inbound course (270°).

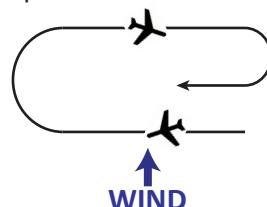
WIND CORRECTION - *Triple the wind correction on the outbound leg*

Whatever amount of wind correction is necessary to maintain the inbound course should be tripled on the outbound leg. This is because the radius of the turns change based on groundspeed. A tailwind in the turn results in a larger turn radius (higher groundspeed) and a headwind results in a smaller turn radius due to a lower groundspeed.

Correct (3x)
Wind Correction



Incorrect: Same
wind correction on
both legs



Hold Practice

HOLD PRACTICE

Using the example holding instructions below draw the hold and decide which entry is appropriate based on your location.

Hold North of the SXC VOR on the 360° radial, left turns.
You are inbound on the 240° radial.



Hold West of the PDX VOR on the 270° radial.
You are inbound on the 135° radial.



Hold NE of the SXC VOR on the 045° radial, left turns.
You are inbound on the 360° radial.



Hold SW of the PDX VOR on the 225° radial.
You are inbound on the 090° radial.



Hold SE of the SXC VOR on the 165° radial.
You are inbound on the 300° radial.



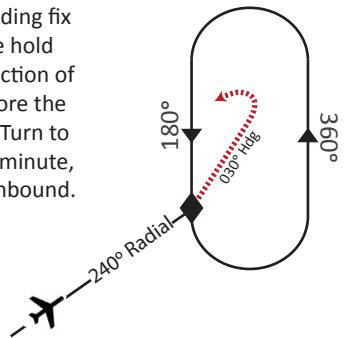
Hold NW of the PDX VOR on the 330° radial.
You are inbound on the 290° radial.



HOLD PRACTICE ANSWERS

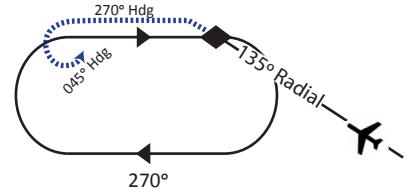
Hold North of the SXC VOR on the 360° radial, left turns.
You are inbound on the 240° radial.

When you cross the holding fix you are headed into the hold but in the opposite direction of the inbound leg, therefore the teardrop entry applies. Turn to a heading of 030° for 1 minute, then turn to intercept inbound.



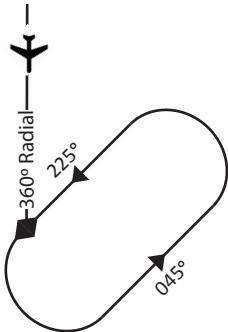
Hold West of the PDX VOR on the 270° radial.
You are inbound on the 135° radial.

When you cross the holding fix you are headed out of the hold and in the opposite direction of the inbound leg, therefore the parallel entry applies. Turn to a heading of 270° for 1 minute, then turn 225° to a heading of 045° to intercept inbound.



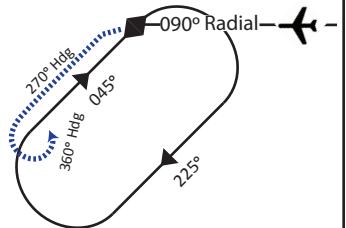
Hold NE of the SXC VOR on the 045° radial, left turns.
You are inbound on the 360° radial.

In this case, the direct entry applies. When crossing the holding fix you can simply turn to follow the hold. Even though you are on a heading that will take you inside of the hold (teardrop) in this case you are flying with the inbound leg (there's no need to turn around), therefore use the direct entry.



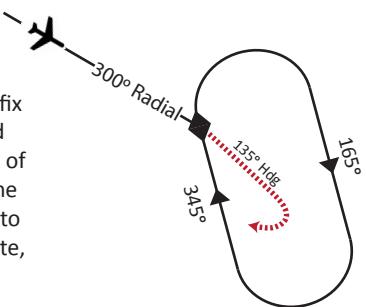
Hold SW of the PDX VOR on the 225° radial.
You are inbound on the 090° radial.

When you cross the holding fix you are headed out of the hold and in the opposite direction of the inbound leg, therefore the parallel entry applies. Turn to a heading of 225° for 1 minute, then turn 225° to a heading of 360° to intercept inbound.



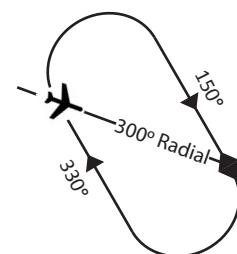
Hold SE of the SXC VOR on the 165° radial.
You are inbound on the 300° radial.

When you cross the holding fix you are headed into the hold but in the opposite direction of the inbound leg, therefore the teardrop entry applies. Turn to a heading of 135° for 1 minute, then turn to intercept the inbound leg.



Hold NW of the PDX VOR on the 330° radial.
You are inbound on the 290° radial.

In this case, the direct entry applies. When crossing the holding fix you can simply turn to follow the hold. Even though you are on a heading that will take you outside of the hold (parallel), in this case you are flying with the inbound leg (there's no need to turn around), therefore use the direct entry.



HOLD PRACTICE

Using the example holding instructions below draw the hold and decide which entry is appropriate based on your location.

Hold East of the 10 DME fix on the GRE VOR 270° radial,
left turns. You are outbound on the 270° radial.



Hold South of the 10 DME fix on the SLI VOR 160° radial.
You are outbound on the 160° radial.



Hold West of the 17 DME fix on the SXC VOR 075° radial,
left turns. You are inbound on the 075° radial.



Hold North of the 13 DME fix on the PDX VOR 180° radial.
You are outbound on the 180° radial.



Hold West of the 17 DME fix on the ORD VOR 290° radial.
You are outbound on the 290° radial.



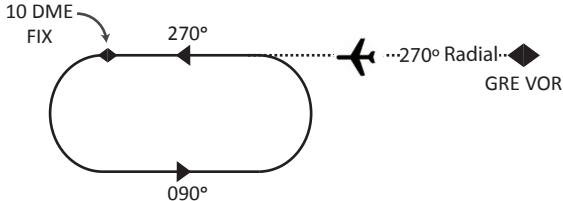
Hold NW of the 11 DME fix on the ORD VOR 120° radial,
left turns. You are inbound on the 120° radial.



HOLD PRACTICE ANSWERS

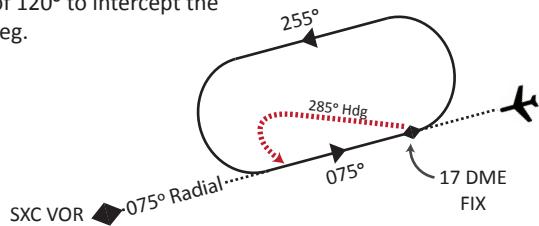
Hold East of the 10 DME fix on the GRE VOR 270° radial, left turns. You are outbound on the 270° radial.

In this case, the direct entry applies. When crossing the holding fix you can simply turn to follow the hold.



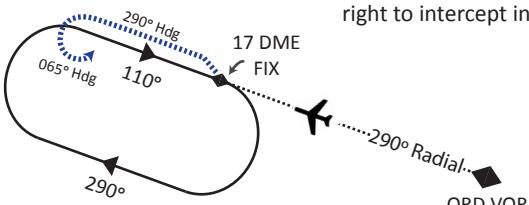
Hold West of the 17 DME fix on the SXC VOR 075° radial, left turns. You are inbound on the 075° radial.

The parallel or teardrop entry applies. Since you are entering opposite the inbound leg, yet neither inside or outside of the hold, either entry will do. The teardrop is depicted. In the parallel entry, parallel the inbound leg for 1 minute, then turn right to a heading of 120° to intercept the inbound leg.

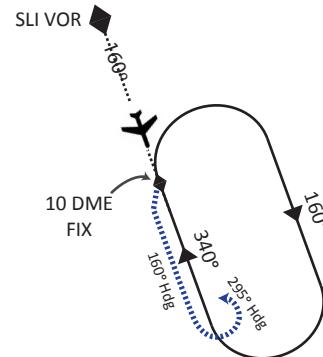


Hold West of the 17 DME fix on the ORD VOR 290° radial. You are outbound on the 290° radial.

The parallel or teardrop entry applies. Since you are entering opposite the inbound leg, yet neither inside or outside of the hold, either entry will do. The parallel is depicted. In the teardrop entry, turn left to a heading of 260° for 1 minute then turn right to intercept inbound.



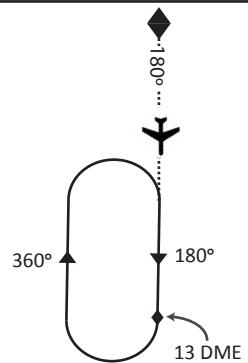
Hold South of the 10 DME fix on the SLI VOR 160° radial. You are outbound on the 160° radial.



The parallel or teardrop entry applies. Since you are entering opposite the inbound leg, yet neither inside or outside of the hold, either entry will do. The parallel is depicted. In the teardrop entry, turn left to a heading of 130° for 1 minute then turn right to intercept the inbound leg.

Hold North of the 13 DME fix on the PDX VOR 180° radial. You are outbound on the 180° radial.

In this case, the direct entry applies. When crossing the holding fix you can simply turn right to follow the hold.



Hold NW of the 11 DME fix on the ORD VOR 120° radial, left turns. You are inbound on the 120° radial.

The parallel or teardrop entry applies. Since you are entering opposite the inbound leg, yet neither inside or outside of the hold, either entry will do. The teardrop is depicted. In the parallel entry, parallel the inbound leg for 1 minute, then turn right to a heading of 165° to intercept the inbound leg.

