

# HOLDING PROCEDURES

FULFILLS IR.III.B & CFII PTS VII.B

|                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Objective</b>                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                             |
| The student shall become familiar with the purpose, elements, and procedures of holds. The student shall understand how to perform a hold considering the effects of wind drift.                                                                                                              |                                                                                                                                                                                                             |
| <b>Instructor Actions</b>                                                                                                                                                                                                                                                                     | <b>Student Actions</b>                                                                                                                                                                                      |
| <ul style="list-style-type: none"><li>- Explain the purpose, elements, and entry procedures for holds</li><li>- Discuss the colloquial, but nonexistent, “protected” and “unprotected” sides of the hold</li><li>- Provide student practice examples for drawing and entering holds</li></ul> | <ul style="list-style-type: none"><li>- Take notes and participate in instructor’s discussion</li><li>- Practice drawing holding entries provided by instructor</li><li>- Chair fly holds at home</li></ul> |
| <b>Case Studies</b>                                                                                                                                                                                                                                                                           | <b>Equipment</b>                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                               | <ul style="list-style-type: none"><li>- Computer</li><li>- FAR/AIM</li><li>- White Board</li></ul>                                                                                                          |
| <b>Completion Standards</b>                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                             |
| The student shall display proficiency in entering and performing holds.                                                                                                                                                                                                                       |                                                                                                                                                                                                             |

## ELEMENTS

|                                    |   |
|------------------------------------|---|
| 1. Purpose .....                   | 1 |
| 2. Elements of the Hold .....      | 2 |
| 3. Entering the Hold .....         | 2 |
| 4. Winds and Timing/Distance ..... | 3 |
| 5. Obstacle Clearance .....        | 3 |
| 6. Speed Limits .....              | 3 |

## RESOURCES

[FAA-S-ACS-8C](#) IR ACS - Area III Task B

[FAA-S-8089-9B](#) CFII PTS - Area VII Task B

FAA-H-8083-15B Instrument Flying Handbook – Chapter 10: IFR Flight

FAA-H-8083-16B Instrument Procedures Handbook - Chapter 2: En Route Operations

[AIM 5-3-8](#)

7110.65 IFR/Holding Aircraft

[ERAU Special VFR Holding Pattern Video](#)

Holding [Practice](#)

## 1. PURPOSE

Holding is a predetermined maneuver that keeps aircraft within a specified airspace while awaiting further clearance from ATC. Holds may be due to delays or to allow aircraft to continue climbing before proceeding on course.

All holding patterns are anchoring on the holding fix And have two components, the inbound leg and outbound leg. The inbound leg is always flown TOWARD the holding fix. Upo passing the holding fix, we then make our left or right turn (as specified) and fly the outbound leg, which takes us away from the holding fix. After a pre-determined about of time or distance, we turn back inbound and repeat the process.

All constraints and instructions are based upon the inbound leg. Holding instructions typically include a holding radial, which is the radial of the inbound leg from the holding fix. Remember, when actually flying the hold, we will fly the reciprocal heading. For example, when specified for 1 minute legs, we should compensate for effects of wind correction in the outbound leg to ensure the inbound leg is always 1 minute. For holds based off distance, this is not necessary.

Lets decode a typical hold instruction: Hold DIRECTION of FIX on the XXX radial, LEFT TURNS, 2 MINUTE, Expect further clearance

**Direction** indicates the general direction of the hold relative to the holding fix. For example, see pics for south, or northwest

**Fix** indicates the holding fix, which can be an intersection or waypoint.

**XXX radial** is most common, but an airway could also be specified

**Turn Direction** If a hold direction is not specified, assume right turns. Otherwise, follow the direction'

**2 mins** -length of inbound leg. If not specified, assume 1 min

EFC – time

If you reach a clearance limit and a hold has not been given, hold on the course you approached the clearance limit

An ATC clearance requiring an aircraft to hold at a fix where the pattern is not charted will include the following information: (See [FIG 5-3-2](#).)

1. Direction of holding from the fix in terms of the eight cardinal compass points (i.e., N, NE, E, SE, etc.).
2. Holding fix (the fix may be omitted if included at the beginning of the transmission as the clearance limit).
3. Radial, course, bearing, airway or route on which the aircraft is to hold.
4. Leg length in miles if [DME](#) or [RNAV](#) is to be used (leg length will be specified in minutes on pilot request or if the controller considers it necessary).
5. Direction of turn if left turns are to be made, the pilot requests, or the controller considers it necessary.
6. Time to expect further clearance and any pertinent additional delay information.

## 2. ELEMENTS OF THE HOLD

### 2.1. Holding Fix and Inbound Leg

This is the anchor point of the hold. We will always fly toward the holding fix while on the inbound leg.

### 2.2. Flying the Holding Pattern

If the hold is not charted, ATC will tell us where the inbound leg is located relative to the holding fix and the specific radial of the inbound leg. Remember, we need to reciprocate this number to find the bearing toward the holding fix.

A standard hold assumes **right turns** and **one minute legs** (or 1.5 mins if above 14000 ft)

**Have student draw examples**

- *“N2539B, hold south of TPSTR on the 180 radial”*
- *“N2539B, hold northeast of VALKA on the 045 radial, left turns, one and a half minute legs”*

## 3. ENTERING THE HOLD

Now that we can draw the hold, how do we begin flying it? Entering the hold depends solely on where we are relative to the hold. Although these entries are not regulated, they are recommended by AIM 5-3.

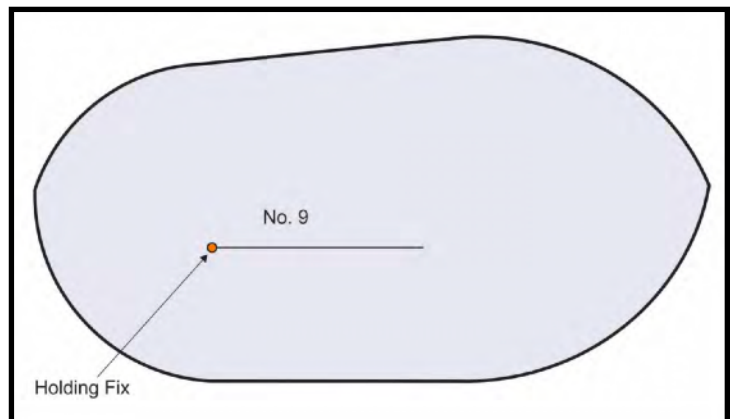
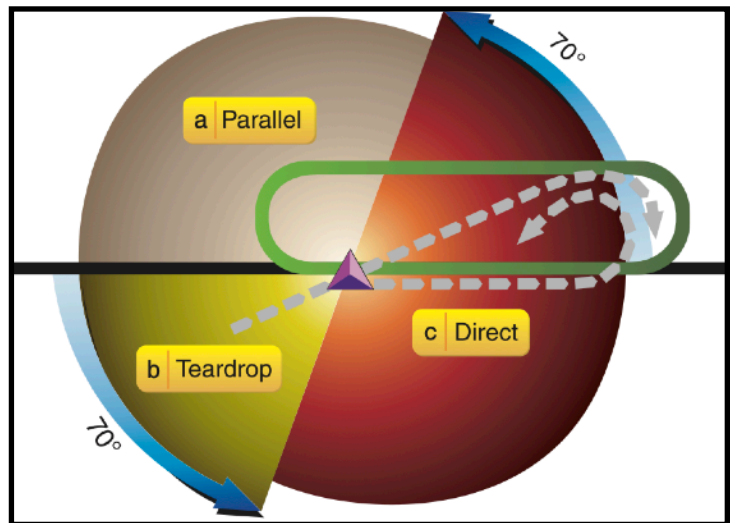
### 3.1. Direct

### 3.2. Parallel

### 3.3. Teardrop (ALWAYS ONE MIN)

I find it easiest to draw the hold, then draw your airplane's heading toward the hold. Then deciphering the best entry is simple.

You may hear some people refer to the holding side as the “protected side” and the other as the “unprotected side”. However, according to the TERPS, there is no unprotected side (TERPS 16-5), rather, it should be called “a larger protected side” and “a smaller protected side.” See the figure to the right.



#### 4. WINDS AND TIMING/DISTANCE

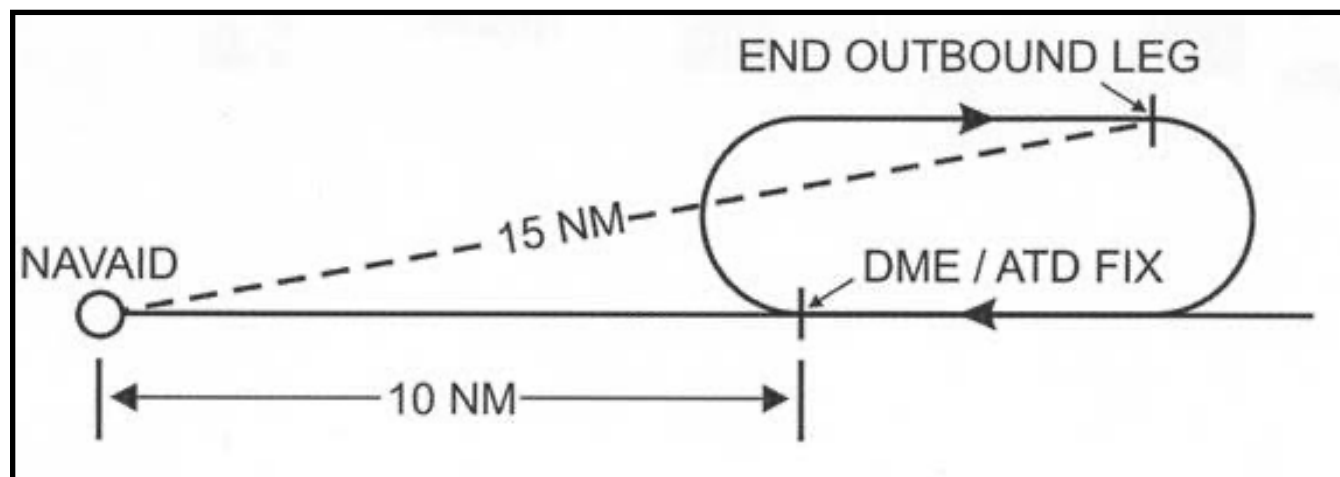
- 3x crosswind angle
- Adjust outbound leg timing as necessary to achieve one minute inbound leg
- Start outbound leg timer abeam or once completed with turn, whichever happens later
- Start inbound leg timer when turn is completed and passing holding fix

#### 5. OBSTACLE CLEARANCE

When enroute or in a STAR or feeder route, the obstacle clearance adheres to the 1000 ft non-mountainous and 2000 ft mountainous guidelines. However, for IAFs, holds, HILPTs, DP holds, and missed approach holds, obstacle clearance is more nuanced (TERPS 16-4).

#### 6. SPEED LIMITS

| Altitude   | Max KIAS |
|------------|----------|
| 0-6000     | 200      |
| 6001-14000 | 230      |
| 14001      | 265      |



|        |                                                                                                                                        |
|--------|----------------------------------------------------------------------------------------------------------------------------------------|
| T Turn | Make turn as required                                                                                                                  |
| T Time | Start or rest time (over/abeam if determinable (VOR), otherwise when rolling wings level (DME))<br>AIM 5-3-8-J-4-B                     |
| T Talk | Report the time and altitude upon reaching a holding fix or point to which cleared and when leaving any assigned holding fix or point. |