

# Instrument Approaches



# Lesson Objective

To develop understanding of Instrument Approaches.

Atlanta Approach: “N123AB you are cleared for the KPUJ ILS 31 approach.”

# What

An instrument approach, or instrument approach procedure (IAP), is a series of predetermined maneuvers for the orderly transfer of an aircraft under instrument flight conditions from the beginning of the initial approach to a landing or to a point from which a landing may be made visually.

These approaches are approved in the United States by the FAA or the United States Department of Defense for the military.

# What

The ICAO defines an instrument approach as:

A series of predetermined maneuvers by reference to flight instruments with specific protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if landing is not completed, to a position at which holding or enroute obstacle clearance criteria apply.

# Why

If you are in the clouds or in an area of near complete darkness, you need to be able to find the runway as well as not hit anything.

An instrument approach is basically a 3D map.

Secondary, an approach will make sure as you get set up to land, you will be lined up for the runway, not too high, and not too low.

# Why

It would be smart to have available the IAPs for any airport you are not familiar with...even when flying VFR.

Not only will it guide you to the runway safely, it also gives you most of the important information.

You have all the frequencies, the elevation, the mini airport diagram, and where to go if you can't see the runway when you get there (missed approach).

# Types

There are three types of IAPs:

Precision Approach (PA)

Approach with vertical guidance (APV)

Non-Precision approach (NPA).

A precision approach (PA) uses a navigation system on the ground that provides course using a localizer signal and glidepath deviation.

The only system you will typically use that the FAA considers a precision approach is an instrument landing system (ILS).

ILS components = localizer, glide slope, Approach lights (optional), Marker beacons (optional)

# Types

A non-precision approach (NPA) uses a navigation system for course deviation but does not provide glidepath information.

These approaches include VOR, NDB and LNAV. NPAs are flown to a minimum descent altitude (MDA).

An approach with vertical guidance (APV) also uses a navigation system for course and glidepath.

Examples include baro-VNAV, localizer type directional aid (LDA) with glidepath, LNAV/VNAV, and LPV.

An LPV is basically the same as using an ILS but without the airport having to maintain equipment.

LDA is basically an offset course localizer.



IFR TRAINING

***ILS***

***SPECIFICATIONS***



# Types

Each procedure chart uses a specific type of electronic navigation system such as an NDB, VOR, ILS, LOC, and RNAV/GPS.

The chart name reflects the primary navigational aid (NAVAID), if there is more than one straight-in procedure or if it is just a circling-only procedure.

A runway number is listed when the approach course is aligned within 30° of the runway centerline to straight-in landing.

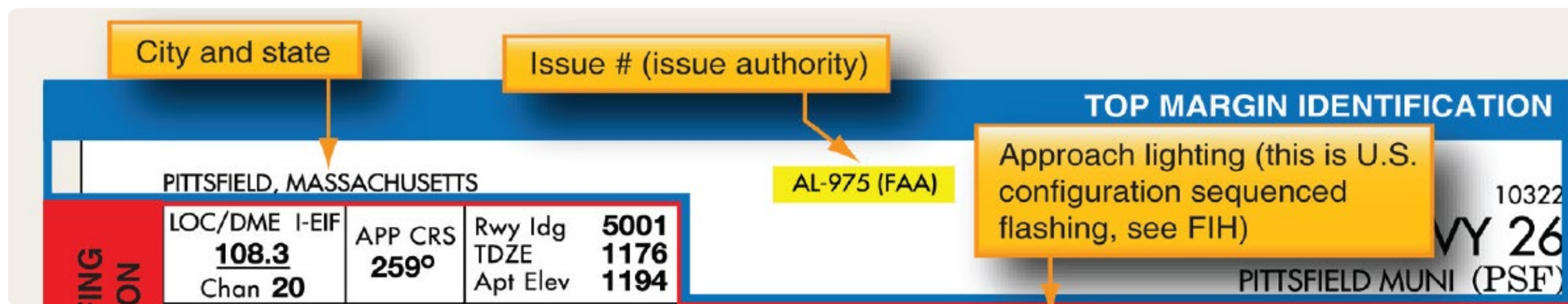
If it is more than 30° from the centerline, a letter is assigned instead: "VOR-A"

22139

**RNAV (GPS)-A**  
DEKALB-PEACHTREE (PDK)

22139

**ILS or LOC RWY 21L**  
DEKALB-PEACHTREE (PDK)



The header at top and bottom of the chart. It depicts the airport location and procedure identification, among other information.

The number at the top center over the margin is the FAA chart reference number.

# Top Margin Identification

AL-9190 (FAA)

22083

# ILS or LOC RWY 30

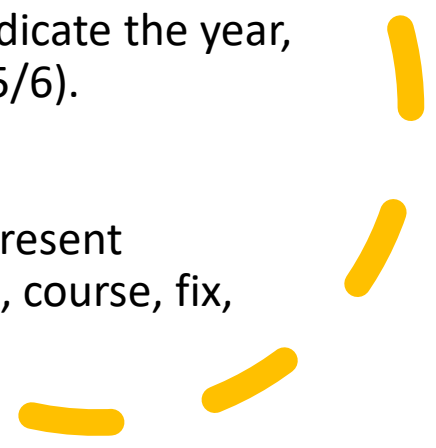
## THOMASTON-UPSON COUNTY (OPN)





22083 = Released on day 83 of 2022

The Date of Latest Revision is shown on the top margin above the procedure title. The Date of Latest Revision identifies the Julian date the chart was last revised for any reason. The first two digits indicate the year, the last three digits indicate the day of the year (001 to 365/6).

## Top Margin Identification

Updates to the amendment number and effective date represent procedural/criteria revisions to the charted procedure, e.g., course, fix, altitude, minima, etc.



LOC I-PDK <b>111.1</b>		APP CRS <b>206°</b>	Rwy Idg <b>4996</b> TDZE <b>991</b> Apt Elev <b>998</b>	ILS or LOC RWY 21L DEKALB-PEACHTREE (PDK)				
RADAR required for procedure entry. DME or RADAR required.				MALSF 	MISSED APPROACH: Climb to 1600 then climbing right turn to 4000 on heading 008° and RMG VORTAC R-092 to BAPPY/RMG 34.7 DME and hold.			
 Circling Rwy 16, 34 NA at night. DME from PDK VOR/DME. Simultaneous reception of I-PDK and PDK DME required.  Rwy 21L helicopter visibility reduction below RVR 4000 NA. For inop ALS, increase S-LOC 21L Cat A/B visibility to RVR 5500.								
ATIS <b>128.4</b>	ATLANTA APP CON <b>126.975 239.275</b>	PEACHTREE TOWER★ <b>120.9</b> (CTAF) <b>281.5</b>		GND CON <b>121.6</b>	CLNC DEL <b>125.2</b>	CLNC DEL <b>120.9</b> (When twr closed)	UNICOM <b>122.95</b>	<b>120.0</b> 

The top row of the boxes contains the ILS/localizer/VOR frequency, the final approach course, the runway landing length, touchdown zone elevation, and the airport elevation.

The middle row has two boxes: a notes box, and a box for information on the missed approach. You'll note a bolded "T" and "A" in the notes section.



The "T" signifies that the airport has non-standard IFR takeoff minimums. This applies to 121 and 135 operators, as there are no regulatory IFR takeoff minimums for Part 91 operations.

## Pilot Briefing

LOC I-PDK <b>111.1</b>	APP CRS <b>206°</b>	Rwy Idg <b>4996</b> TDZE <b>991</b> Apt Elev <b>998</b>
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## ILS or LOC RWY 21L

DEKALB-PEACHTREE (PDK)

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<div><div><div></div><div></div></div><div>Circling Rwy 16, 34 NA at night. DME from PDK VOR/DME. Simultaneous reception of I-PDK and PDK DME required. Rwy 21L helicopter visibility reduction below RVR 4000 NA. For inop ALS, increase S-LOC 21L Cat A/B visibility to RVR 5500.</div></div>							
ATIS 128.4	ATLANTA APP CON 126.975 239.275	PEACHTREE TOWER★ 120.9 (CTAF) 281.5	GND CON 121.6	CLNC DEL 125.2	CLNC DEL 120.9 (When twr closed)	UNICOM 122.95	120.0 

# Pilot Briefing

The bolded "A" signifies that non-standard alternate minimums exist for the airport.



If "NA" is specified it indicates that alternate minimums are not authorized due to it being an unmonitored facility or lack of a weather reporting service.



LOC I-PDK <b>111.1</b>	APP CRS <b>206°</b>	Rwy Idg <b>4996</b> TDZE <b>991</b> Apt Elev <b>998</b>
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## ILS or LOC RWY 21L

DEKALB-PEACHTREE (PDK)

RADAR required for procedure entry. DME or RADAR required.				MALSF 	MISSED APPROACH: Climb to 1600 then climbing right turn to 4000 on heading 008° and RMG VORTAC R-092 to BAPPY/RMG 34.7 DME and hold.		
<div><div><div>T</div><div>A</div></div><div>Circling Rwy 16, 34 NA at night. DME from PDK VOR/DME. Simultaneous reception of I-PDK and PDK DME required. Rwy 21L helicopter visibility reduction below RVR 4000 NA. For inop ALS, increase S-LOC 21L Cat A/B visibility to RVR 5500.</div></div>							
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# Pilot Briefing

The missed approach section will give you a textual description of the missed approach procedure and should be reviewed carefully each time you brief the approach.

LOC I-PDK <b>111.1</b>	APP CRS <b>206°</b>	Rwy Idg <b>4996</b> TDZE <b>991</b> Apt Elev <b>998</b>
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## ILS or LOC RWY 21L

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# Pilot Briefing

The bottom row in the margin identification section has the important frequencies for the airport.

These include the weather, approach/departure, unicom, tower, ground, etc frequencies.



ASPEN, COLORADO

AL-5889 (FAA)

23222

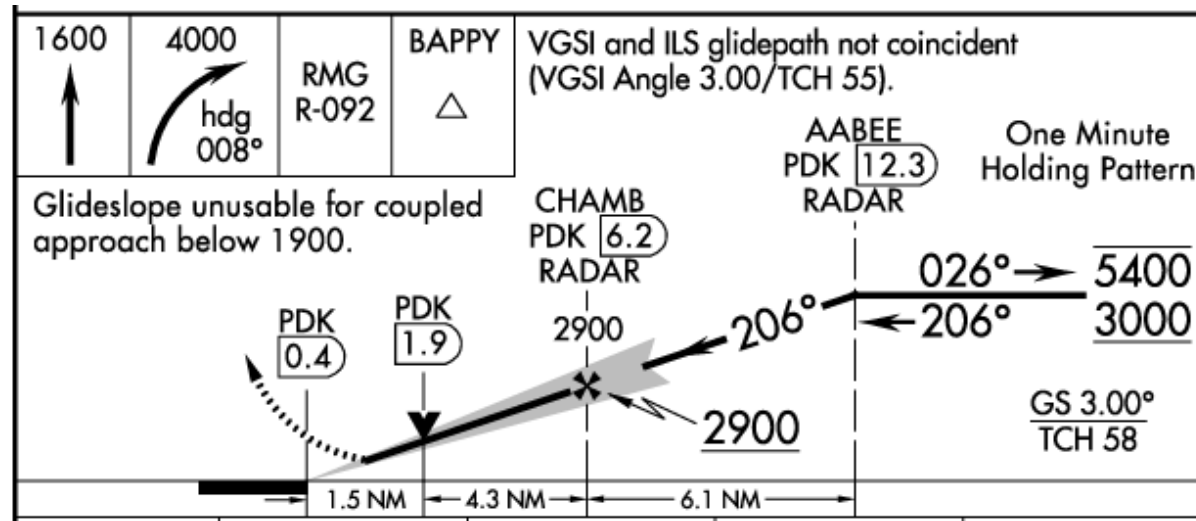
LOC/DME I-ASE <b>111.15</b> Chan <b>48</b> (Y)		APP CRS <b>151°</b>	Rwy Idg TDZE Apt Elev <b>N/A</b> <b>N/A</b> <b>7838</b>	LOC/DME-E ASPEN-PITKIN COUNTY/SARDY FLD (ASE)	
<div><div><div>T</div><div>A</div><div>NA</div><div>NA</div><div>NA</div></div><div>Procedure NA at night. Circling NA for Cat C southwest of Rwy 15-33.</div></div>			MISSED APPROACH: Climbing right turn to 14000 on heading 300° and on I-PKN localizer NW course (303°) to LINDZ INT/DBL 12.6 DME and on DBL VOR/DME R-244 to GLENO INT/DBL 22.7 DME and hold.		
ATIS <b>120.4</b>	ASPEN APP CON ★ <b>123.8 288.3</b>	ASPEN TOWER ★ <b>118.85 (CTAF) 0 288.3</b>	GND CON <b>121.9</b>	CLNC DEL <b>123.75</b>	UNICOM <b>122.95</b>

The snowflake icon indicates a cold temperature altitude correction will be required on an approach when the reported temperature is, “at or below” the temperature specified for that airport.

# Pilot Briefing

See the AIM 7-2-3, ICAO Cold Temperature Error Table





# Profile View

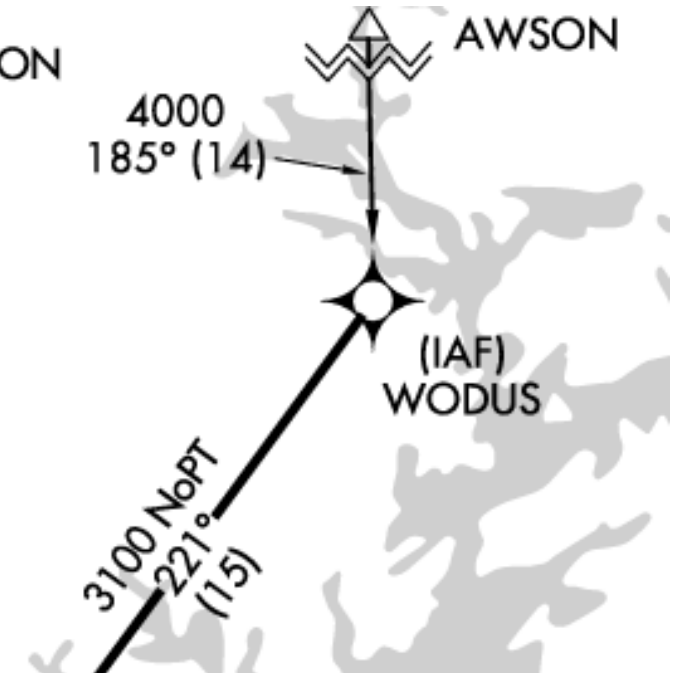
The profile view is a drawing of the side view of a procedure that illustrates the vertical approach path altitudes, headings, distances, and fixes.

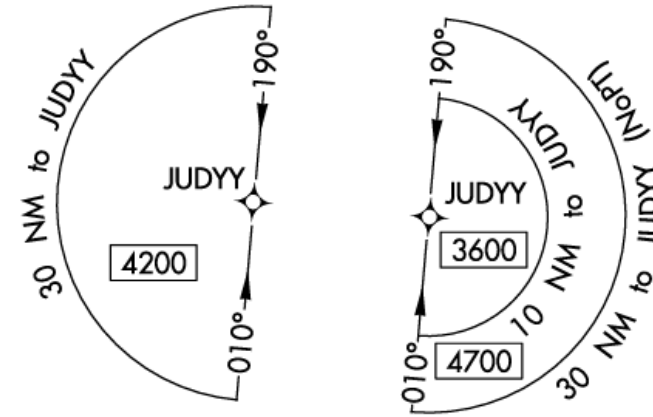
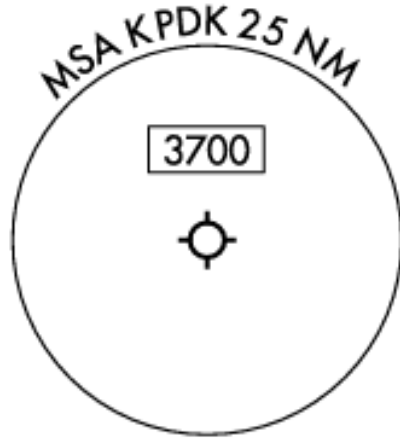
It includes the minimum altitudes and maximum distance for a procedure turn, altitudes over prescribed fixes, distances between fixes, and the missed approach procedure.

# Plan View

When a route segment outside the circle is drawn to scale, the symbol is two jagged lines and it interrupts the segment.

Procedure NA for arrivals at AWSON  
on T297 northwest bound and  
on V5-311-417 westbound.





# Plan View

The MSA (Minimum Safe Altitude) circle appears in the plan view except in approaches for which the navaid is unavailable.

The MSA circle guarantees 1000 ft clearance over obstacles and terrain.

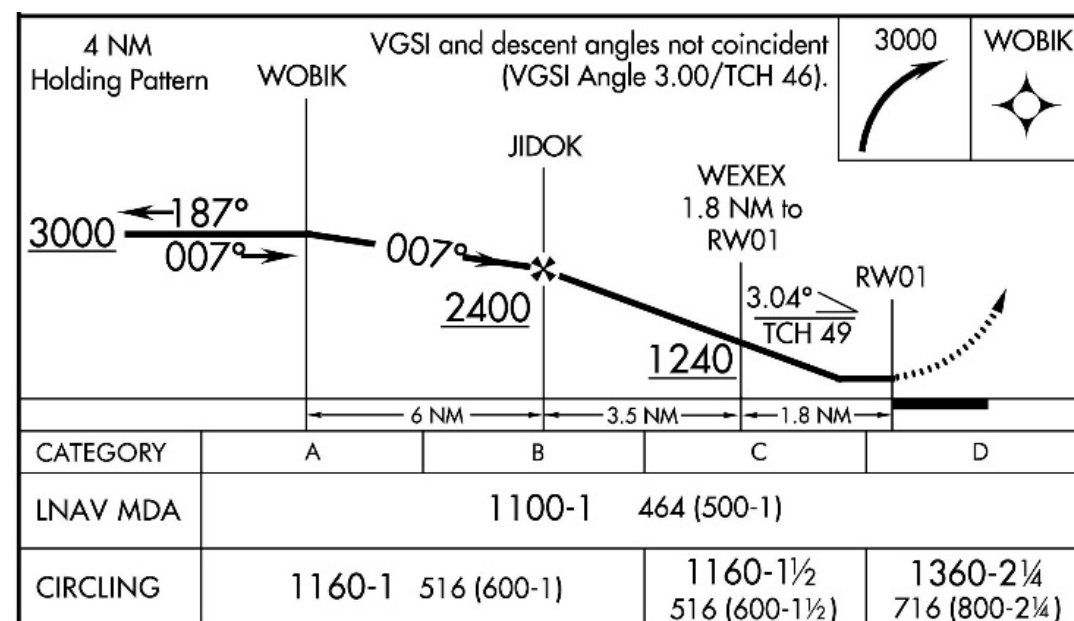
The Terminal Arrival Area (TAA) provides a transition from the en route structure to the terminal environment with little required pilot/air traffic control interface for aircraft equipped with Area Navigation (RNAV) systems. A TAA provides minimum altitudes with standard obstacle clearance when operating within the TAA boundaries.

# “Chop and Drop”

If you are more than 11.3 NM from the runway, anything up to WOBIK you must stay above 3000 ft MSL.

Between WOBIK and JIDOK you must stay above 2400.

The moment you pass WOBIK you can immediately drop if you wish but there is no need to.

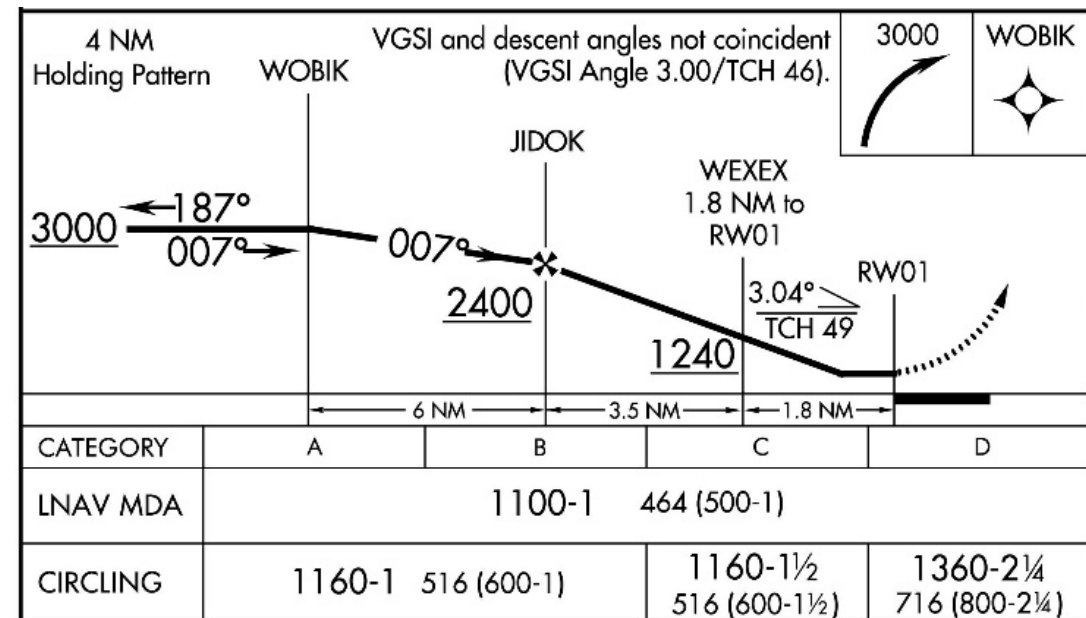


# Step Down Minimums

This approach does not have VNAV.

Between JIDOK and WEXEX you must stay above 1240.

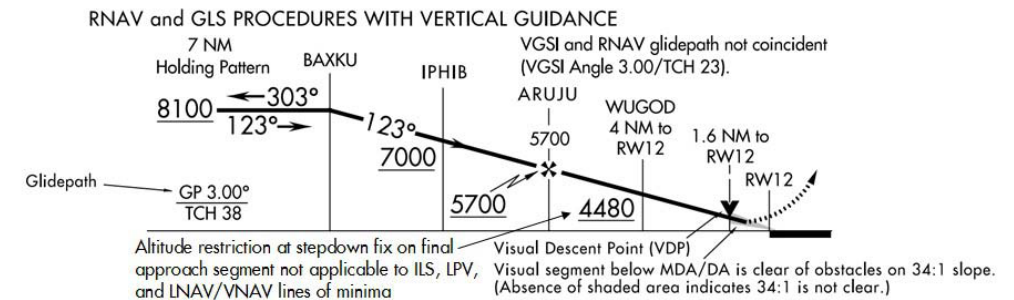
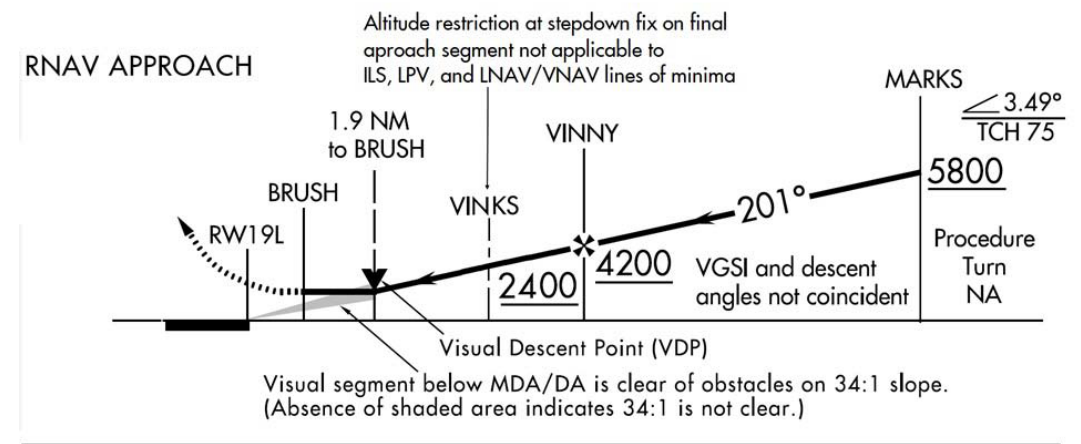
After WEXEX you must stay above LNAV MDA/CIRCLING minimums until you can see the runway.



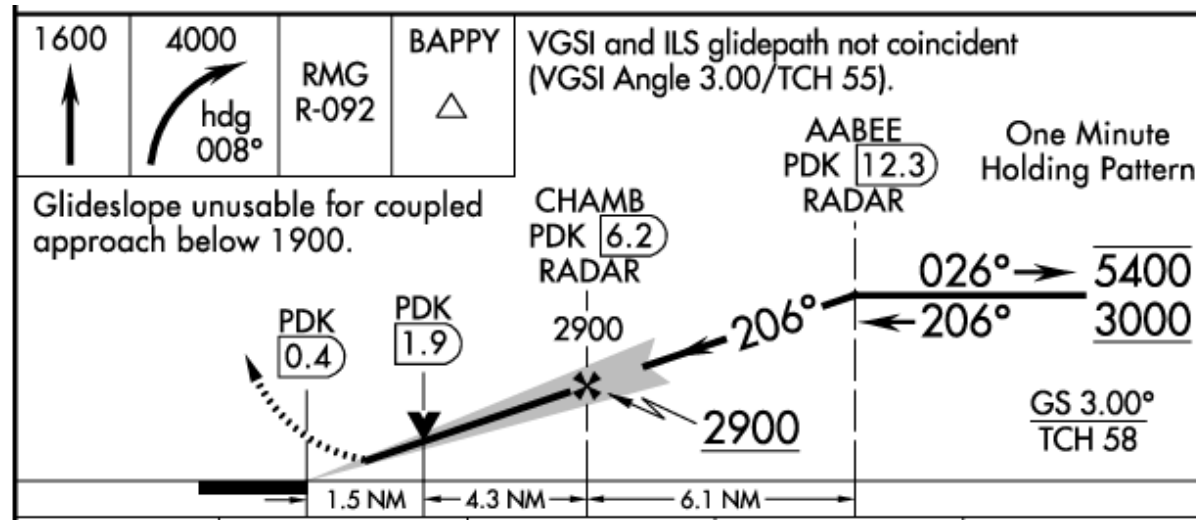
# Stepdown Fix

## AIM 5-4-5

Altitude restrictions depicted at stepdown fixes within the final approach segment are applicable only when flying a Non-Precision Approach to a straight-in or circling line of minima identified as an MDA (H). These altitude restrictions may be annotated with a note “LOC only” or “LNAV only.” Stepdown fix altitude restrictions within the final approach segment do not apply to pilots using Precision Approach (ILS) or Approach with Vertical Guidance (LPV, LNAV/VNAV) lines of minima identified as a DA(H), since obstacle clearance on these approaches is based on the aircraft following the applicable vertical guidance. Pilots are responsible for adherence to stepdown fix altitude restrictions when outside the final approach segment (i.e., initial or intermediate segment), regardless of which type of procedure the pilot is flying.





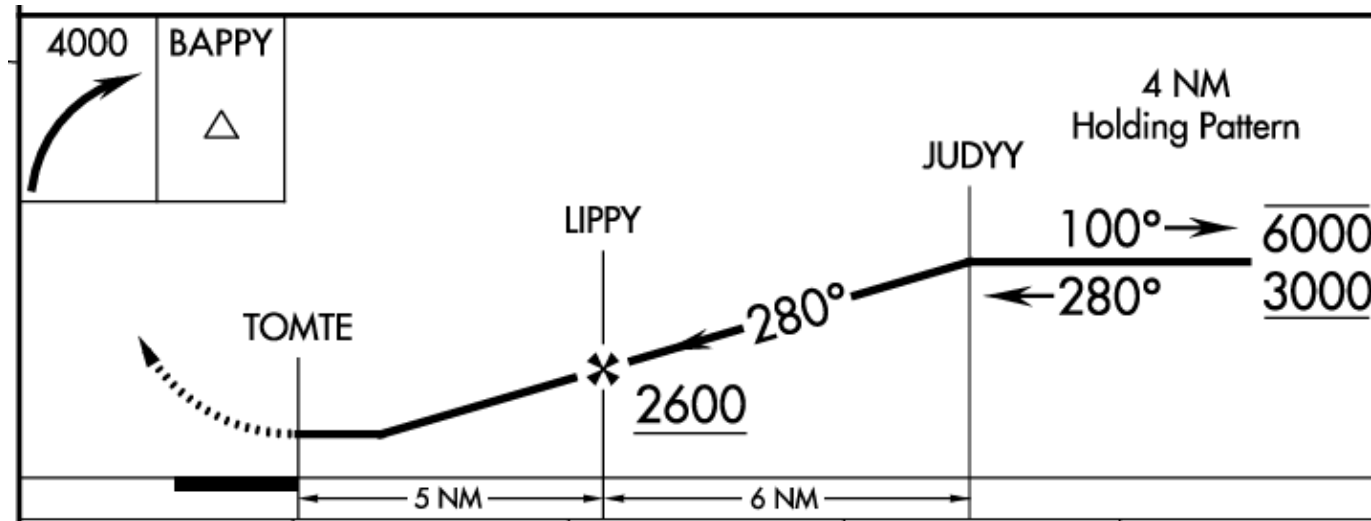


# Final Approach Fix (FAF)

Glide-slope intercept altitude is represented by lightning symbol.

When a fix is incorporated in a non-precision final segment, two sets of minimums may be published, depending upon whether or not fix can be identified.

Precision approaches use a decision altitude (DA) charted in MSL followed by decision height (DH) referenced in height above threshold elevation (HAT).



Precision approaches use a decision altitude (DA).

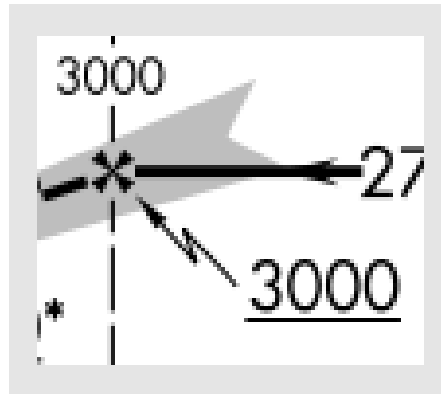
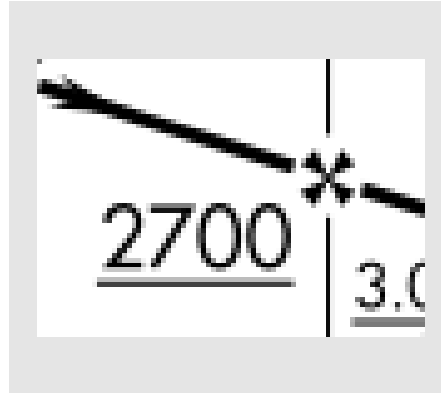
Non-precision approaches use a minimum descent altitude (MDA).

The primary difference being that when a pilot reaches a DA, the missed approach must immediately be executed if the runway environment is not yet in sight.

With an MDA, the pilot levels off at or above that altitude and continues until either the missed approach point, or the runway environment comes into view.

# Final Approach Fix (FAF)

# Final Approach Fix (FAF)



Lighting bolt = precision FAF  
determined by altitude

Which is determined by  
altimeter setting

X = non precision FAF

Determined by NM away

# MDA vs DA vs DH

Minimum Descent Altitude (MDA), Decision Altitude (DA), And Decision Height (DH):

MDA (MSL) — the lowest altitude, expressed in feet MSL, to which descent is authorized on final approach or during circle-to-land maneuvering in execution of a standard instrument approach procedure (SIAP) where no electronic glideslope is provided.

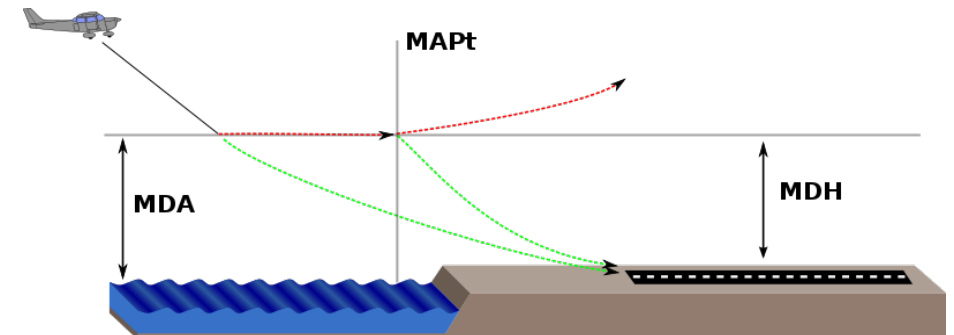
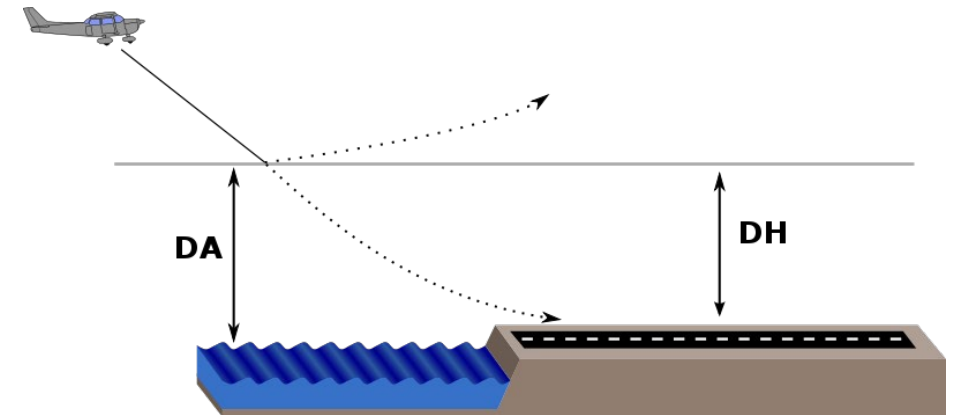
DA (MSL) — a specified altitude in the precision approach at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

DH (AGL) — with respect to the operation of aircraft, means the height at which a decision must be made during an ILS to either continue the approach or to execute a missed approach.

# Go Around Decisions

DA/DH = Precision Approach land or go around decision

MDA/MDH = Non-Precision Approach land or go around decision



<https://youtu.be/ETe6aQwwuE>





# Minimums and Categories

The altitude minimums for the approach are located at the bottom of the profile section.

The minimums are separated by approach "category", which is determined by the speed of the aircraft flying the approach.

Aircraft approach category means a grouping of aircraft based on a reference landing speed (VREF), if specified, or if VREF is not specified, 1.3 VSO at the maximum certified landing weight.

VREF, VSO, and the maximum certified landing weight are those values as established for the aircraft by the certification authority of the country of registry.

A pilot must use the minima corresponding to the category determined during certification or higher.

# Minimums and Categories

Helicopters may use Category A minima.


If it is necessary to operate at a speed in excess of the upper limit of the speed range for an aircraft's category, the minimums for the higher category must be used.

For example, an airplane that fits into Category B, but is circling to land at a speed of 145 knots, must use the approach Category D minimums.






# Minimums and Categories



<u>Category</u>	<u>Speed</u>
A	0-90
B	91-120
C	121-140
D	141-165
E	166+



# For a category A plane

S-ILS 31 - If the ILS is working then 1483 ft MSL/200 ft AGL is your minimum. If you do not see the runway environment, follow the Missed Approached Procedure (MAP).

Also notice you must be able to see for  $\frac{3}{4}$  of a mile.

CATEGORY	A	B	C	D
S-ILS 31	1483- $\frac{3}{4}$ 200 (200- $\frac{3}{4}$ )			
S-LOC 31	1680-1 397 (400-1)			1680-1 $\frac{1}{4}$ 397 (400-1 $\frac{1}{4}$ )
CIRCLING	1880-1 591 (600-1)		1880-1 $\frac{1}{2}$ 591 (600-1 $\frac{1}{2}$ )	1940-2 651 (700-2)

# For a category A plane

S-LOC 31 – If the glide slope is not working but the localizer is working then 1680 ft MSL/400 ft AGL is your minimum. Also notice you must be able to see for a mile.

CATEGORY	A	B	C	D
S-ILS 31	1483- $\frac{3}{4}$ 200 (200- $\frac{3}{4}$ )			
S-LOC 31	1680-1 397 (400-1)			1680-1 $\frac{1}{4}$ 397 (400-1 $\frac{1}{4}$ )
CIRCLING	1880-1 591 (600-1)		1880-1 $\frac{1}{2}$ 591 (600-1 $\frac{1}{2}$ )	1940-2 651 (700-2)

# For a category A plane

Circling – If the winds favor runway 13, then 1880 ft MSL/600 ft AGL above is your minimum.

If the glide slope and localizer are not working, you should use GPS 31 instead.

CATEGORY	A	B	C	D
S-ILS 31	1483- $\frac{3}{4}$ 200 (200- $\frac{3}{4}$ )			
S-LOC 31	1680-1 397 (400-1)			1680-1 $\frac{1}{4}$ 397 (400-1 $\frac{1}{4}$ )
CIRCLING	1880-1 591 (600-1)		1880-1 $\frac{1}{2}$ 591 (600-1 $\frac{1}{2}$ )	1940-2 651 (700-2)

# LPV DA for category A

LPV DA – If you have vertical and lateral guidance 1483 ft MSL/200 ft AGL is your minimum.

This is the same as when you use the ILS. Not bad considering no equipment to maintain on the ground.

Localizer Performance with Vertical Guidance (LPV) approaches take advantage of the refined accuracy of WAAS lateral and vertical guidance to provide an approach very similar to a Category I ILS.

CATEGORY	A	B	C	D
LPV DA	1483- <sup>3</sup> / <sub>4</sub> 200 (200- <sup>3</sup> / <sub>4</sub> )			
LNAV/ VNAV DA	1635-1 <sup>1</sup> / <sub>4</sub> 352 (400-1 <sup>1</sup> / <sub>4</sub> )			
LNAV MDA	1720-1 437 (500-1)	1720-1 <sup>1</sup> / <sub>4</sub> 437 (500-1 <sup>1</sup> / <sub>4</sub> )	1720-1 <sup>1</sup> / <sub>2</sub> 437 (500-1 <sup>1</sup> / <sub>2</sub> )	1720-1 <sup>1</sup> / <sub>2</sub> 437 (500-1 <sup>1</sup> / <sub>2</sub> )
CIRCLING	1880-1 591 (600-1)	1880-1 <sup>1</sup> / <sub>2</sub> 591 (600-1 <sup>1</sup> / <sub>2</sub> )	1880-1 <sup>1</sup> / <sub>2</sub> 591 (600-1 <sup>1</sup> / <sub>2</sub> )	1940-2 651 (700-2)

# LPV DA for category A

Like an ILS, an LPV has vertical guidance and is flown to a Decision Altitude (DA).

The design of an LPV approach incorporates angular guidance with increasing sensitivity as an aircraft gets closer to the runway (or point in space (PinS) type approaches for helicopters).

Sensitivities are nearly identical to those of the ILS at similar distances.

CATEGORY	A	B	C	D
LPV DA	1483- <sup>3</sup> / <sub>4</sub> 200 (200- <sup>3</sup> / <sub>4</sub> )			
LNAV/ VNAV DA	1635-1 <sup>1</sup> / <sub>4</sub> 352 (400-1 <sup>1</sup> / <sub>4</sub> )			
LNAV MDA	1720-1 437 (500-1)	1720-1 <sup>1</sup> / <sub>4</sub> 437 (500-1 <sup>1</sup> / <sub>4</sub> )	1720-1 <sup>1</sup> / <sub>2</sub> 437 (500-1 <sup>1</sup> / <sub>2</sub> )	1720-1 <sup>1</sup> / <sub>2</sub> 437 (500-1 <sup>1</sup> / <sub>2</sub> )
CIRCLING	1880-1 591 (600-1)	1880-1 <sup>1</sup> / <sub>2</sub> 591 (600-1 <sup>1</sup> / <sub>2</sub> )	1940-2 651 (700-2)	1940-2 651 (700-2)

# LNAV/VNAV DA for category A

LNAV/VNAV DA – 1635 ft MSL/400 ft AGL

Lateral Navigation/Vertical Navigation (LNAV/VNAV) approaches provide both horizontal and approved vertical approach guidance.

Vertical Navigation (VNAV) utilizes an internally generated glideslope based on WAAS or baro-VNAV systems.

CATEGORY	A	B	C	D
LPV DA	1483- <sup>3</sup> / <sub>4</sub> 200 (200- <sup>3</sup> / <sub>4</sub> )			
LNAV/VNAV DA	1635-1 <sup>1</sup> / <sub>4</sub> 352 (400-1 <sup>1</sup> / <sub>4</sub> )			
LNAV MDA	1720-1 437 (500-1)	1720-1 <sup>1</sup> / <sub>4</sub> 437 (500-1 <sup>1</sup> / <sub>4</sub> )	1720-1 <sup>1</sup> / <sub>2</sub> 437 (500-1 <sup>1</sup> / <sub>2</sub> )	
CIRCLING	1880-1 591 (600-1)	1880-1 <sup>1</sup> / <sub>2</sub> 591 (600-1 <sup>1</sup> / <sub>2</sub> )	1940-2 651 (700-2)	

# LNAV MDA DA for category A

LNAV MDA – 1720 ft MSL/500 ft AGL

Localizer Performance without Vertical Guidance (LP) and Lateral Navigation (LNAV).

LPs are non-precision approaches with WAAS lateral guidance.

They are added in locations where terrain or obstructions do not allow publication of vertically guided LPV procedures.

CATEGORY	A	B	C	D
LPV DA	1483- <sup>3</sup> / <sub>4</sub> 200 (200- <sup>3</sup> / <sub>4</sub> )			
LNAV/ VNAV DA	1635-1 <sup>1</sup> / <sub>4</sub> 352 (400-1 <sup>1</sup> / <sub>4</sub> )			
LNAV MDA	1720-1	437 (500-1)	1720-1 <sup>1</sup> / <sub>4</sub> 437 (500-1 <sup>1</sup> / <sub>4</sub> )	1720-1 <sup>1</sup> / <sub>2</sub> 437 (500-1 <sup>1</sup> / <sub>2</sub> )
CIRCLING	1880-1	591 (600-1)	1880-1 <sup>1</sup> / <sub>2</sub> 591 (600-1 <sup>1</sup> / <sub>2</sub> )	1940-2 651 (700-2)



# LNAV MDA DA for category A

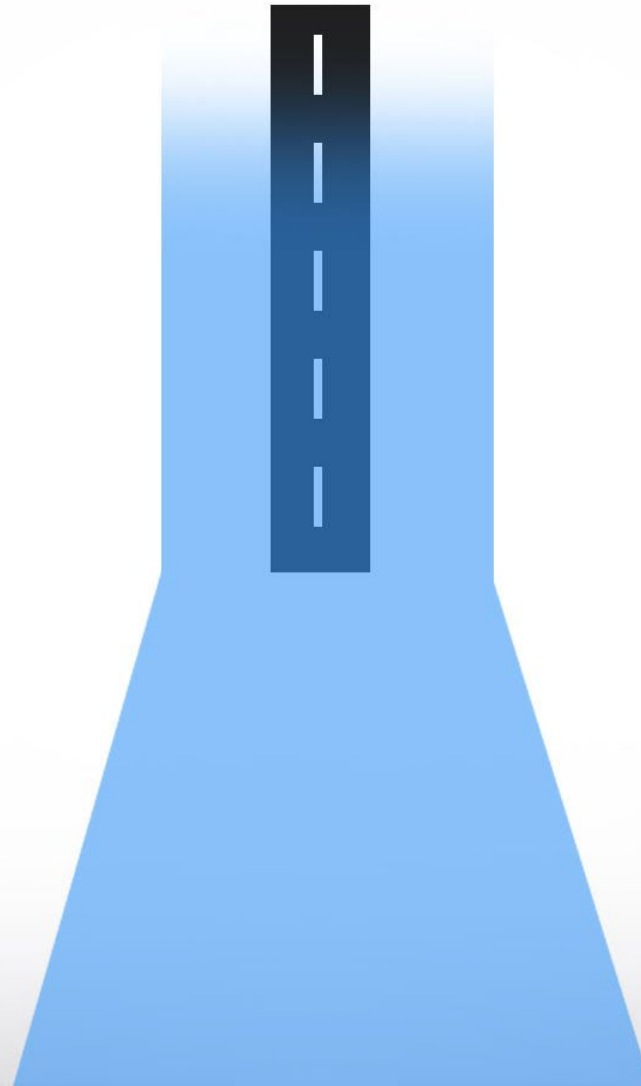
Lateral sensitivity increases as an aircraft gets closer to the runway (or PinS type approaches for helicopters). LP is not a fail-down mode for an LPV.

LP and LPV are independent.

LP minimums will not be published with lines of minima that contain approved vertical guidance (LNAV/VNAV or LPV).

CATEGORY	A	B	C	D
LPV DA	1483- <sup>3</sup> / <sub>4</sub> 200 (200- <sup>3</sup> / <sub>4</sub> )			
LNAV/ VNAV DA	1635-1 <sup>1</sup> / <sub>4</sub> 352 (400-1 <sup>1</sup> / <sub>4</sub> )			
LNAV MDA	1720-1 437 (500-1)	1720-1 <sup>1</sup> / <sub>4</sub> 437 (500-1 <sup>1</sup> / <sub>4</sub> )	1720-1 <sup>1</sup> / <sub>2</sub> 437 (500-1 <sup>1</sup> / <sub>2</sub> )	1720-1 <sup>1</sup> / <sub>2</sub> 437 (500-1 <sup>1</sup> / <sub>2</sub> )
CIRCLING	1880-1 591 (600-1)	1880-1 <sup>1</sup> / <sub>2</sub> 591 (600-1 <sup>1</sup> / <sub>2</sub> )	1940-2 651 (700-2)	1940-2 651 (700-2)

# **An LPV Approach Gets Increasingly Sensitive, Then Becomes Linear As You Approach The Threshold**



# **An LNAV/VNAV Approaches Are Less Sensitive, And Linear Throughout The Final Approach Course**



# LPV vs LNAV/VNAV vs LNAV +V

<https://www.boldmethod.com/learn-to-fly/navigation/what-is-the-difference-between-lpv-and-lnav-vnav-and-plus-v-gps-approaches/>

# Circling for category A

Circling – 1880 ft MSL/600 ft AGL  
Same as the ILS approach.

CATEGORY	A	B	C	D
LPV DA	1483- <sup>3</sup> / <sub>4</sub> 200 (200- <sup>3</sup> / <sub>4</sub> )			
LNAV/ VNAV DA	1635-1 <sup>1</sup> / <sub>4</sub> 352 (400-1 <sup>1</sup> / <sub>4</sub> )			
LNAV MDA	1720-1	437 (500-1)	1720-1 <sup>1</sup> / <sub>4</sub> 437 (500-1 <sup>1</sup> / <sub>4</sub> )	1720-1 <sup>1</sup> / <sub>2</sub> 437 (500-1 <sup>1</sup> / <sub>2</sub> )
CIRCLING	1880-1	591 (600-1)	1880-1 <sup>1</sup> / <sub>2</sub> 591 (600-1 <sup>1</sup> / <sub>2</sub> )	1940-2 651 (700-2)

# Expanded Circling area



CIRCLING MDA IN FEET MSL	APPROACH CATEGORY AND CIRCLING RADIUS (NM)				
	CAT A	CAT B	CAT C	CAT D	CAT E
1000 or less	1.3	1.7	2.7	3.6	4.5
1001-3000	1.3	1.8	2.8	3.7	4.6
3001-5000	1.3	1.8	2.9	3.8	4.8
5001-7000	1.3	1.9	3.0	4.0	5.0
7001-9000	1.4	2.0	3.2	4.2	5.3
9001 and above	1.4	2.1	3.3	4.4	5.5

# Circling Only Approaches

- Circling-only approaches are approaches not design for any specific runway, requiring a circle to land maneuver in the visual segment to land
- There are no Federal Aviation Regulations (FARs) specific to the circling maneuver
- Why #1: The final approach course alignment with the runway centerline exceeds 30 degrees.
- Why #2: The descent gradient is greater than 400 ft/NM from the FAF to the threshold crossing height (TCH). When this maximum gradient is exceeded, the circling only approach procedure may be designed to meet the gradient criteria limits. This does not preclude a straight-in landing if a normal descent and landing can be made in accordance with the applicable CFRs.
- Why #3: A runway is not clearly defined on the airfield.

# Circling Only Approaches

- Circling-only approach plates are labeled with the Navigation Aid (NAVAID) and a letter (VOR-A)  
KPDK RNAV (GPS)-A
- Airports with more than one circling-only approach will increase the letter designation (VOR-A, VOR-B)  
PHMK VOR OR TACAN-A  
PHMK RNAV (GPS)-B

NTSB released this:

<https://www.nts.gov/Advocacy/safety-alerts/Documents/SA-084.pdf>



# Glide Path

Large aircraft approaching to land normally use a 3 degree approach path.

This is equivalent to 3.14 nautical miles per 1000 ft of descent.

If exactly 3 NM are allowed per 1000 ft of descent, the glide path will be 3.14 degrees.

TCH = Standard Threshold Crossing Height

TCH 40 means you cross the threshold at 40 ft AGL

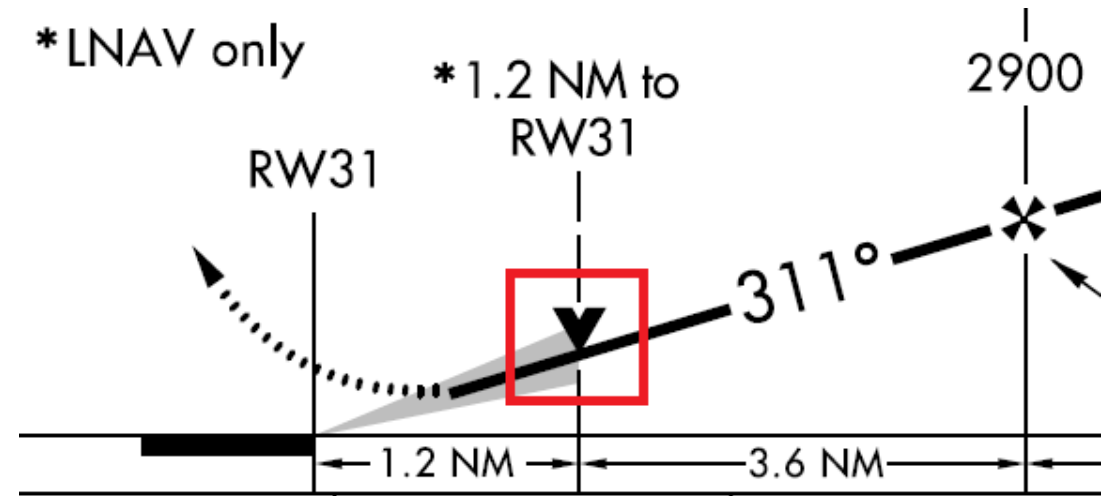
GP 3.00°  
TCH 40

# VDP

The Visual Descent Point (VDP) is a defined point on a straight-in, non-precision approach from which you can descend below the MDA, as long as you have the required visual reference.

If a VDP is available, it will be indicated by a "v" on the profile view portion of the instrument approach procedure chart.

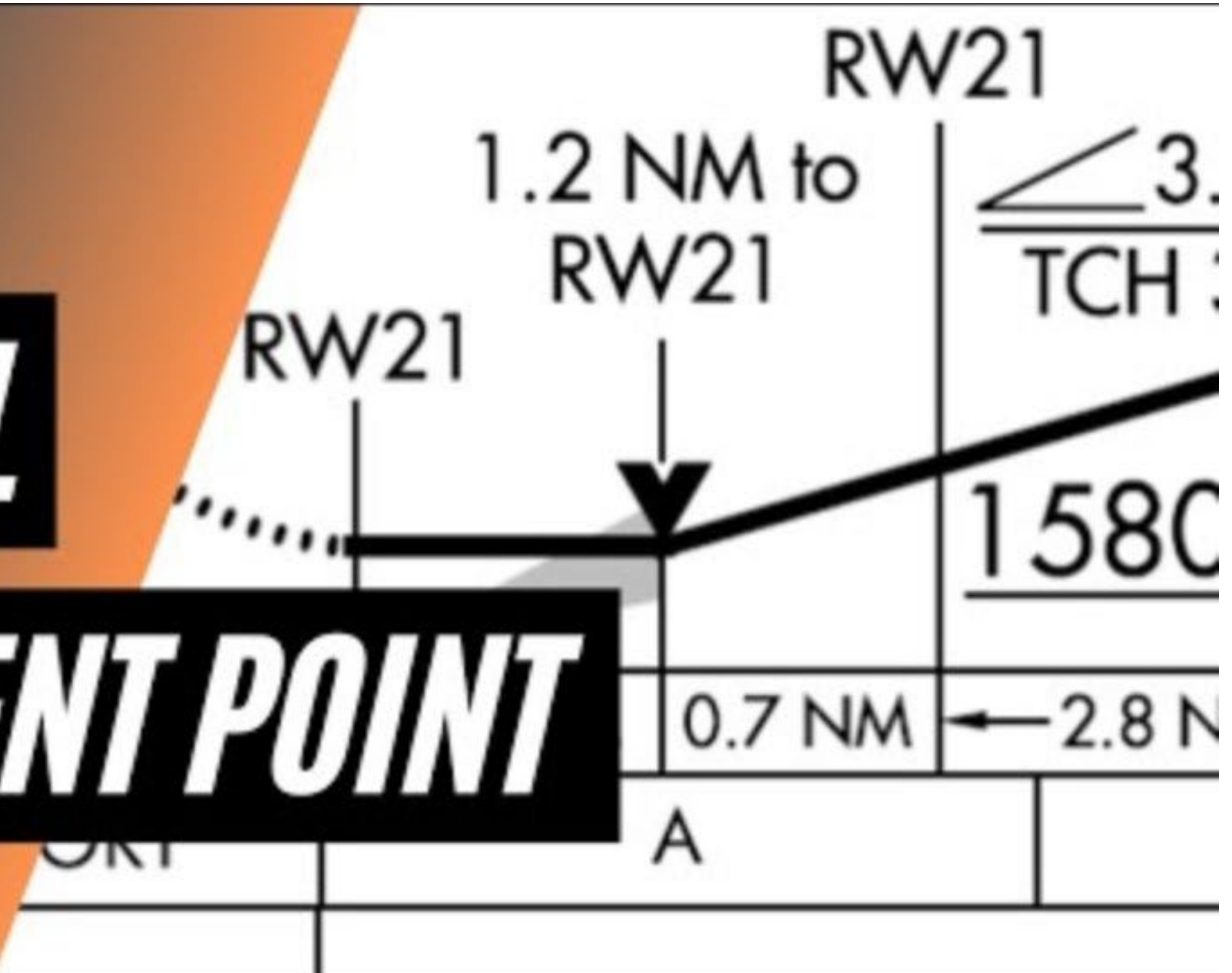
Do not descend below MDA before reaching the VDP.



IFR TRAINING

***VISUAL***

***DESCENT POINT***



# VDP (from Amazon Gemini)

- **Definition:** It's a defined point on the final approach course where pilots can **begin a stabilized visual descent to the runway touchdown point**. They shouldn't descend below the Minimum Descent Altitude (MDA) before reaching this point.
- **Purpose:** It provides a safe reference for pilots to transition from instrument guidance to visual landing when appropriate. By starting the descent at the VDP, they can follow a standard 3-degree glide path, similar to precision approaches, and land smoothly.
- **Availability:** VDPs are only published for **straight-in instrument approaches** to specific runways. You won't find them on circling-only approaches or precision approaches like ILS.
- **Identification:** On approach plates, VDPs are usually marked with a **black "V" symbol**. Consult the specific approach information for details.

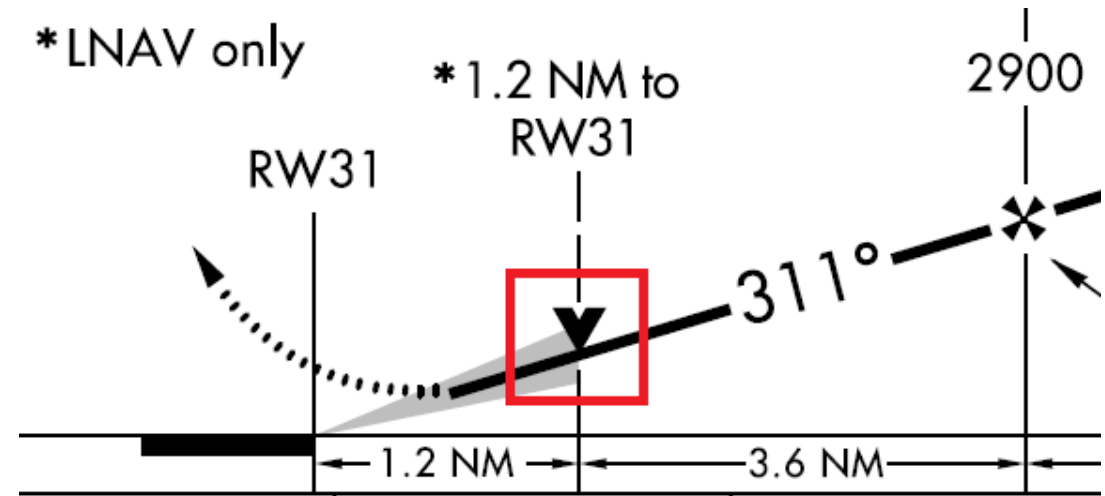
# VDP (from Amazon Gemini)

- **Importance:** Reaching the VDP and making a safe visual descent depend on **having the required visibility and acquiring necessary visual references**. If these conditions aren't met, pilots must perform a missed approach.
- **Estimating VDP:** While not ideal, a rule of thumb exists: divide the MDA height above touchdown by 300. However, referring to published information is always safer.
- **VDP vs. Missed Approach Point (MAPC):** VDP indicates when to start a visual descent, while MAPC specifies where a missed approach should be initiated if landing isn't achievable.

# The Stipple

AeroNav GPS approaches indicate that the 34:1 slope on the visual segment is clear of obstructions through the depiction of a light grey stipple line connecting the course line to the runway in the profile view.

There is no indication at all on Jepp charts due to the requirement for international consistency.



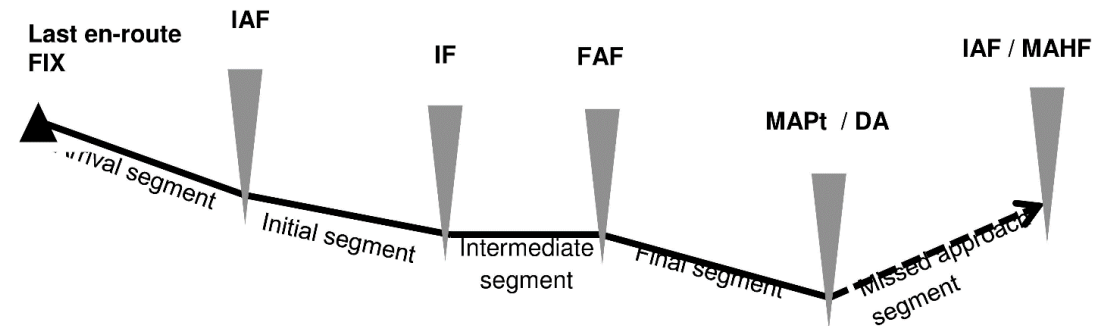
# Segments

IAF = initial approach fix is a fix that marks the beginning of the initial segment and the end of the arrival segment, if applicable.

In RNAV application, this fix is normally defined by a fly-by waypoint.

IF = intermediate fix is a fix that marks the end of an initial segment and the beginning of the intermediate segment.

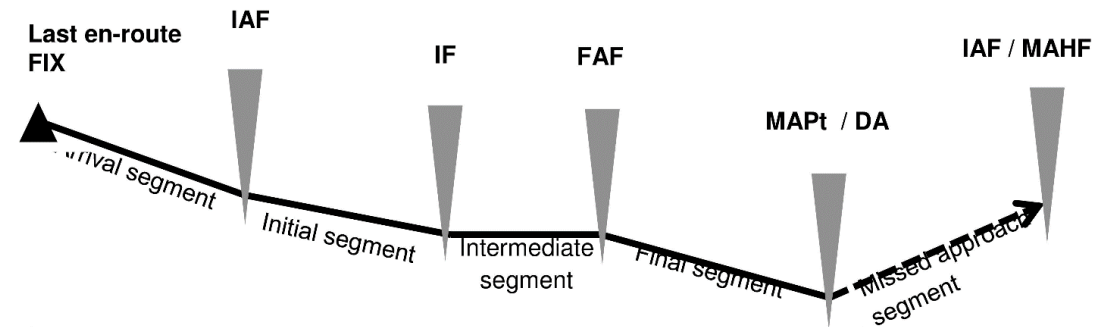
In RNAV application, this fix is normally defined by a fly-by waypoint.



# Segments

FAF = final approach fix is a fix that marks the end of an intermediate segment and the beginning of the final approach segment for non-precision approach.

FAP = final approach point is a fix that marks the end of an intermediate segment and the beginning of the final approach segment for precision approach.

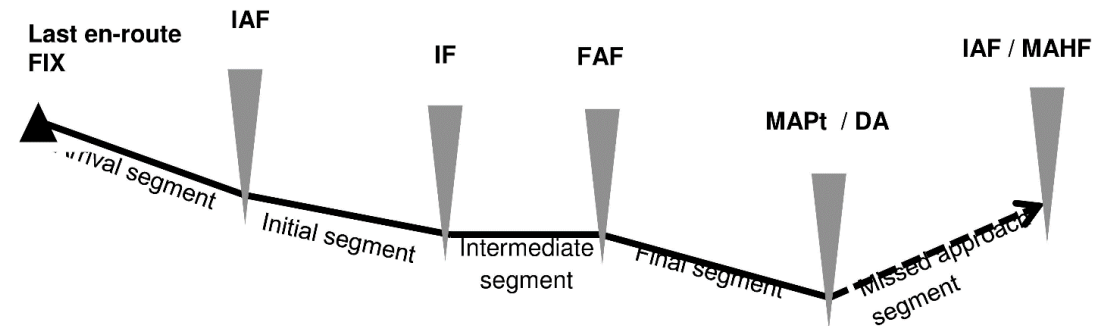




# Segments

MAPt = Missed approach point is a point in an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed.

MAHF = Missed approach holding fix is a fix used in RNAV application that marks the end of the missed approach segment and the center point for the missed approach holding.

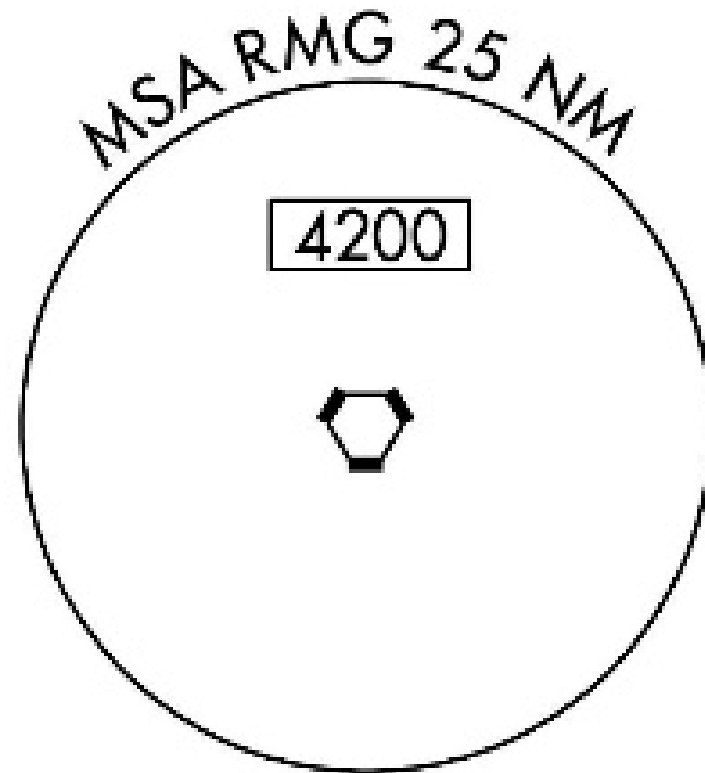


# MSA

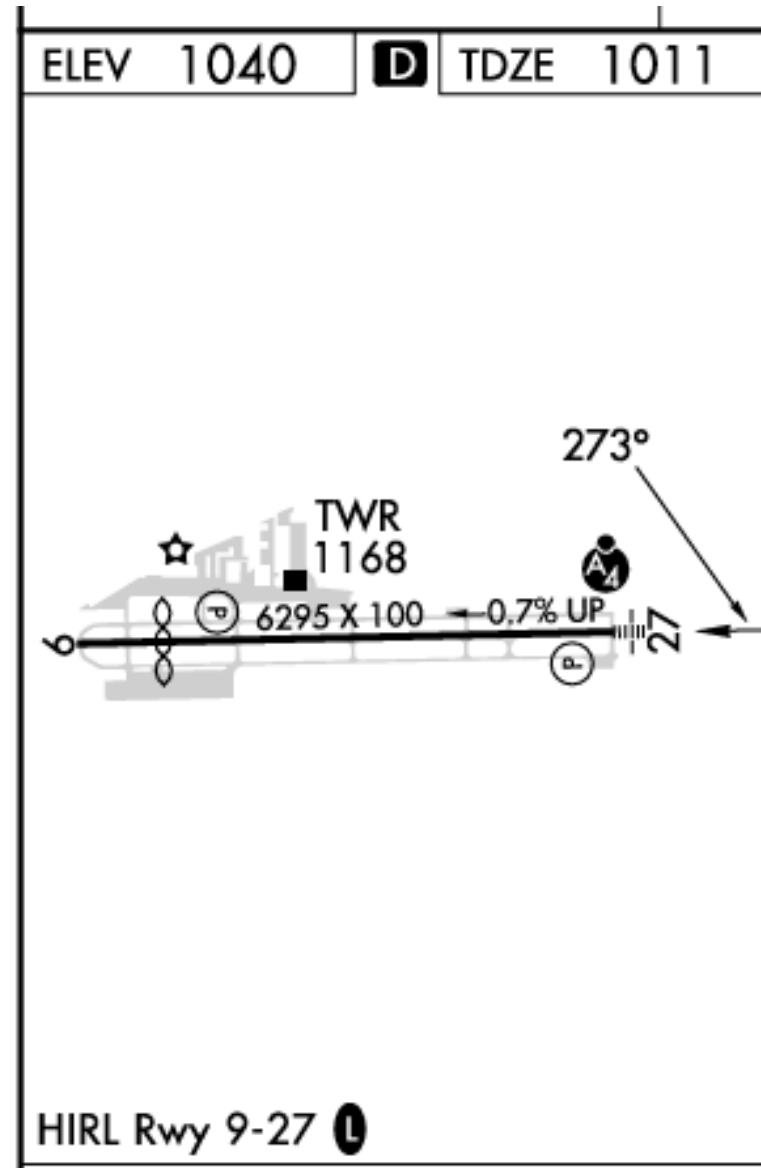
Minimum Sector Altitude named MSA is the lowest altitude which may be used which will provide a minimum clearance of 300 m (= 1000ft) above all objects located in the area contained within a sector of a circle of 46 km (=25 NM) radius centered on a radio navigation aid.

This does not guarantee acceptable navigational aid reception.

Figure shows an MSA of 4200 within 25 NM of VOR RMG



# Airport Diagram



# The D

There is runway declared distance information available in the Chart Supplement for takeoff and landing

See my lesson called Runways



# The L

There is pilot controlled lighting

For airports with towers when the tower is closed

| HIRL Rwy 9-27 **L**

# For More Detailed Info

See Instrument Procedure Handbook FAA-H-8083-16

<https://www.flyingmag.com/everything-you-need-to-know-about-rnav-gps-approaches/>

[https://www.faa.gov/air\\_traffic/publications/atpubs/atc\\_html/chap5\\_section\\_9.html](https://www.faa.gov/air_traffic/publications/atpubs/atc_html/chap5_section_9.html)



Any questions I can answer or  
follow up later on?