

Non Directional Beacon (NDB)  
And  
**Other Non-Precision Approaches**

Localizer approach

Localizer/DME approach

Localizer approach

Localizer/DME approach

Simplified Directional Facility approach

# NDB APPROACHES

Phasing out in U.S. !!

**Important in *International***  
***Navigation***

# NDB PRO'S and CON'S

## Advantages

You will find these approaches at a lot of airports *around the world* where there is nothing else available.

## Disadvantages

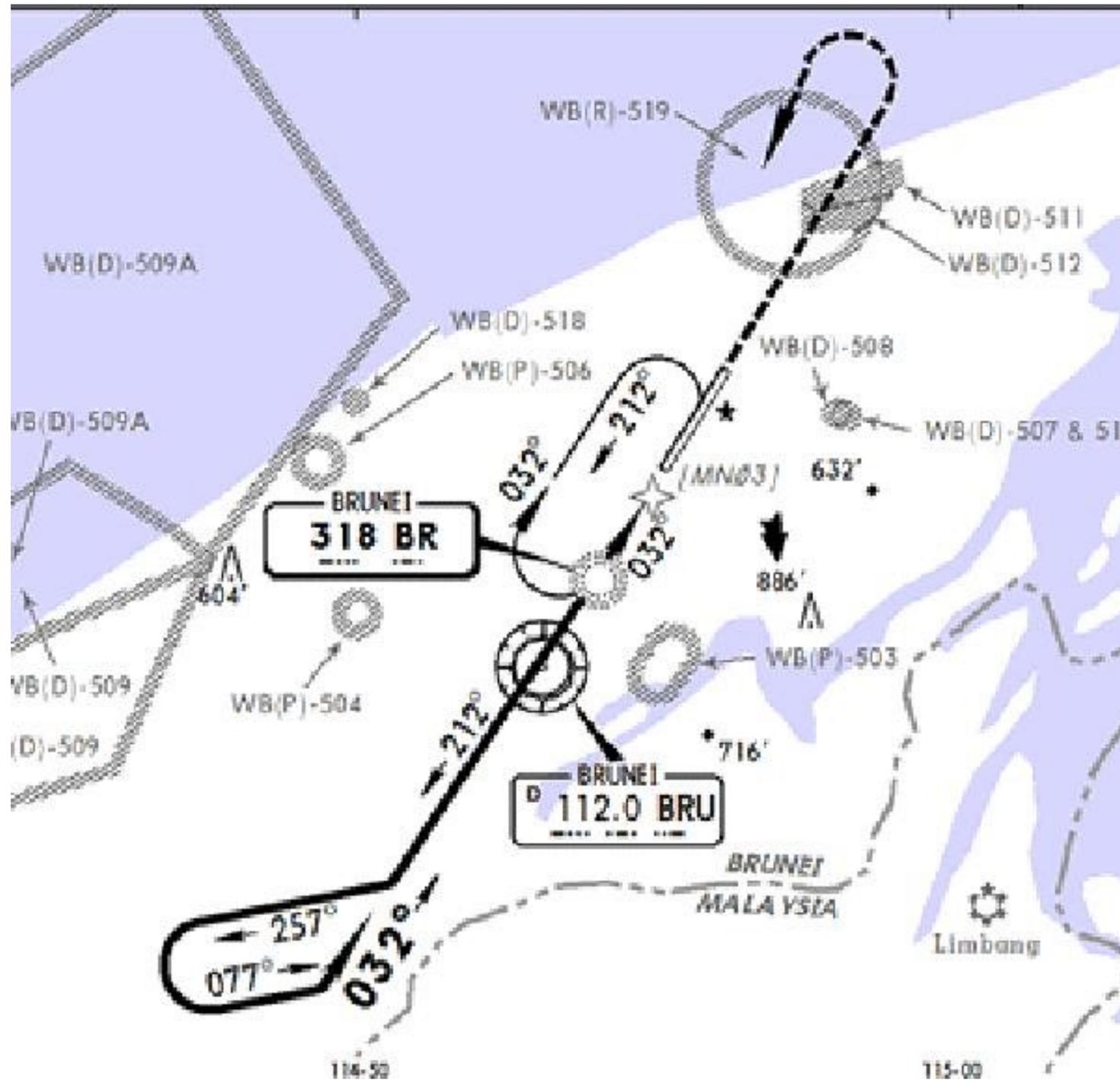
Radio beacons are subject to disturbances that may result in erroneous bearing information. Such disturbances result from such factors as lightning, precipitation static, etc. At night, radio beacons are vulnerable to interference from distant stations. Nearly all disturbances which affect the Automatic Direction Finder (ADF) bearing also affect the facility's identification. Noisy identification usually occurs when the ADF needle is erratic. Voice, music or erroneous identification may be heard when a steady false bearing is being displayed. Since ADF receivers do not have a "flag" to warn the pilot when erroneous bearing information is being displayed, the pilot should continuously monitor the NDB's identification.

# NDB Approaches

Like the VOR approach, an NDB approach can be designed using facilities both on and off the airport, with or without a FAF, and with or without DME availability.

At one time, it was commonplace for an instrument student to learn how to fly an NDB approach, but with the growing use of GPS, many pilots no longer use the NDB for instrument approaches. New RNAV approaches are also rapidly being constructed into airports that are served only by NDB. The long-term plan includes the gradual phase out of NDB facilities, and eventually, the NDB approach becomes nonexistent. Until that time, the NDB provides additional availability for instrument pilots into many smaller, remotely located airports.

When a FAF is established for an NDB approach, the approach design criteria changes. It also takes into account whether or not the NDB is located on or off the airport. Additionally, this type of approach can be made both moving toward or away from the NDB facility.



# NDB Approaches

## Vectors to the Approach

It is more expedient for you and better for overall traffic flow if you are vectored to the final approach.

## Preparing for the Approach

- Conduct a chart review to familiarize yourself with procedures.
- Check the associated airport diagram for each procedure.
- Set your ADF to positively identify the NDB. Leave the volume turned up to continue listening to the identifier.
- Set the heading indicator on the ADF to runway heading, set altimeter, finish landing checklist.

Clearance Example: “Skyhawk 1234, maintain xxx feet until established on the final approach course, cleared for the xxxx NDB Runway XX approach. Contact the tower 118.98 at (NDB name)”

## Inbound to the IAF

- Make sure to complete the landing checklist early in the approach. When the ADF needle swings around to point behind you, begin your descent and set your stopwatch and report to the tower (if there is one).

## Final Approach Segment

- Use the time limit as indicated on the NDB approach chart. Track inward at the MDA and only descend when you are in a position for a safe landing. The VASI is a good cue for initiating a final descent.

## Missed Approach

- Immediately begin your climbing turn. Turn to place the ADF needle off the aircraft's nose and proceed direct to the station. Report the missed approach to tower and await further instructions.

# Other Non-Precision Approaches

## Localizer Approaches

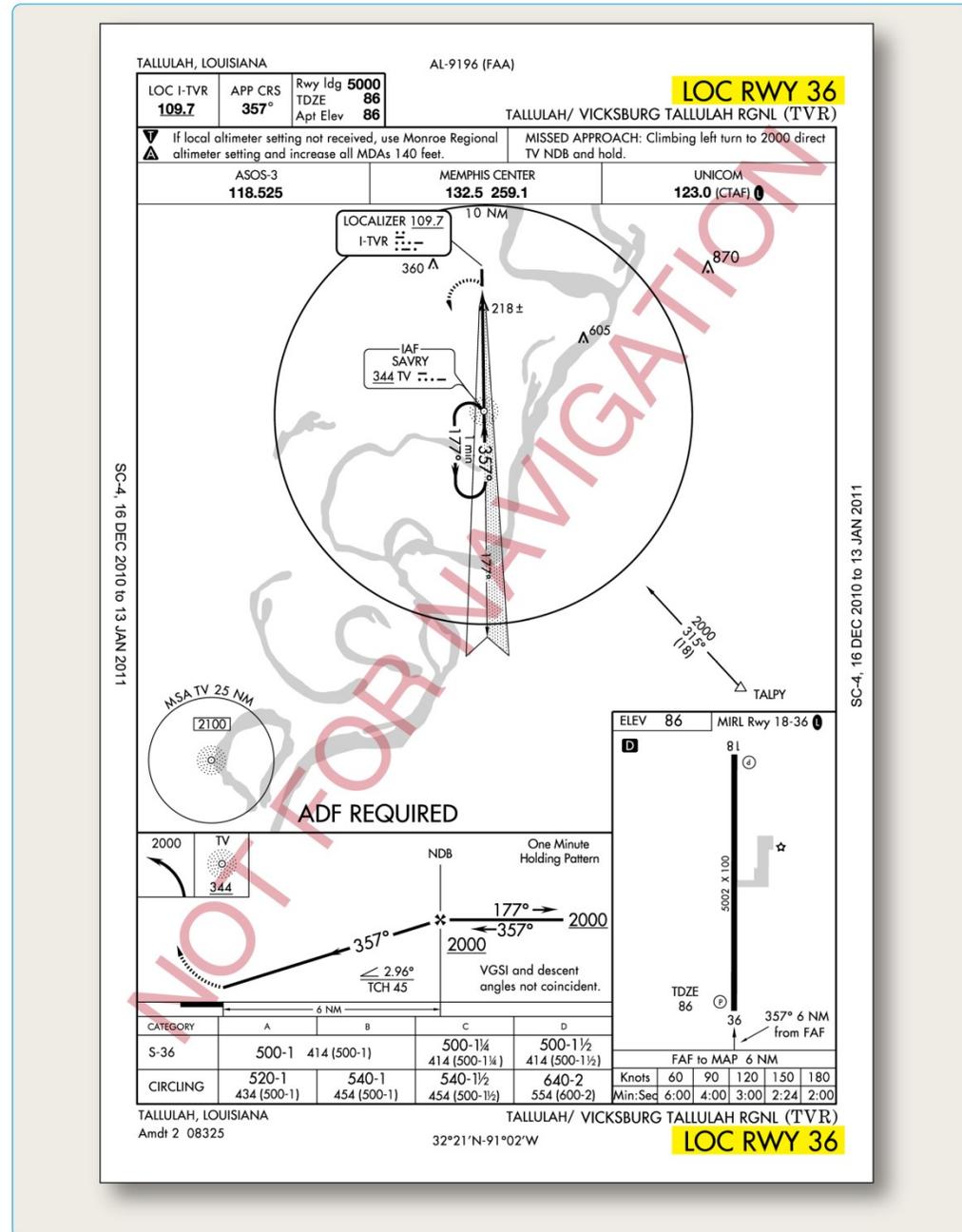
As an approach system, the localizer is an extremely flexible approach aid that, due to its inherent design, provides many applications for a variety of needs in instrument flying. An ILS glideslope installation may be impossible due to surrounding terrain. For whatever reason, the localizer is able to provide four separate applications from one approach system:

- Localizer approach
- Localizer/DME approach
- Localizer back course approach
- Localizer-type directional aid (LDA)

# Other Non-Precision Approaches

## Localizer and Localizer DME

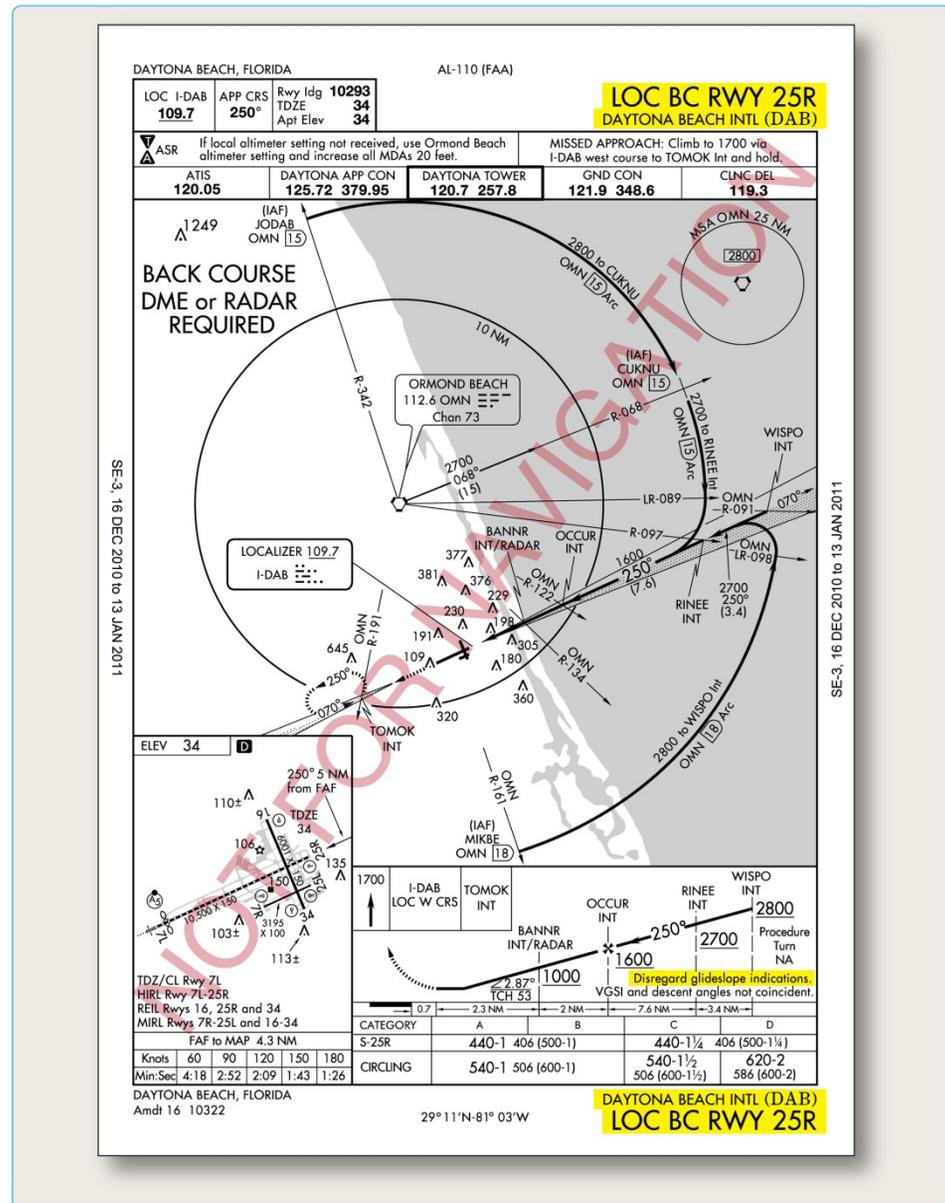
The localizer approach system can provide both precision and non-precision approach capabilities to a pilot. As a part of the ILS system, the localizer provides horizontal guidance for a precision approach. Typically, when the localizer is discussed, it is thought of as a non-precision approach due to the fact that either it is the only approach system installed, or the glideslope is out of service on the ILS. In either case, the localizer provides a non-precision approach using a localizer transmitter installed at a specific airport.



# Other Non-Precision Approaches

## Localizer Back Course

In cases where an ILS is installed, a back course may be available in conjunction with the localizer. Like the localizer, the back course does not offer a glideslope, but remember that the back course can project a false glideslope signal and the glideslope should be ignored. Reverse sensing occurs on the back course using standard VOR equipment. With a horizontal situation indicator (HSI) system, reverse sensing is eliminated if it is set appropriately to the front course.

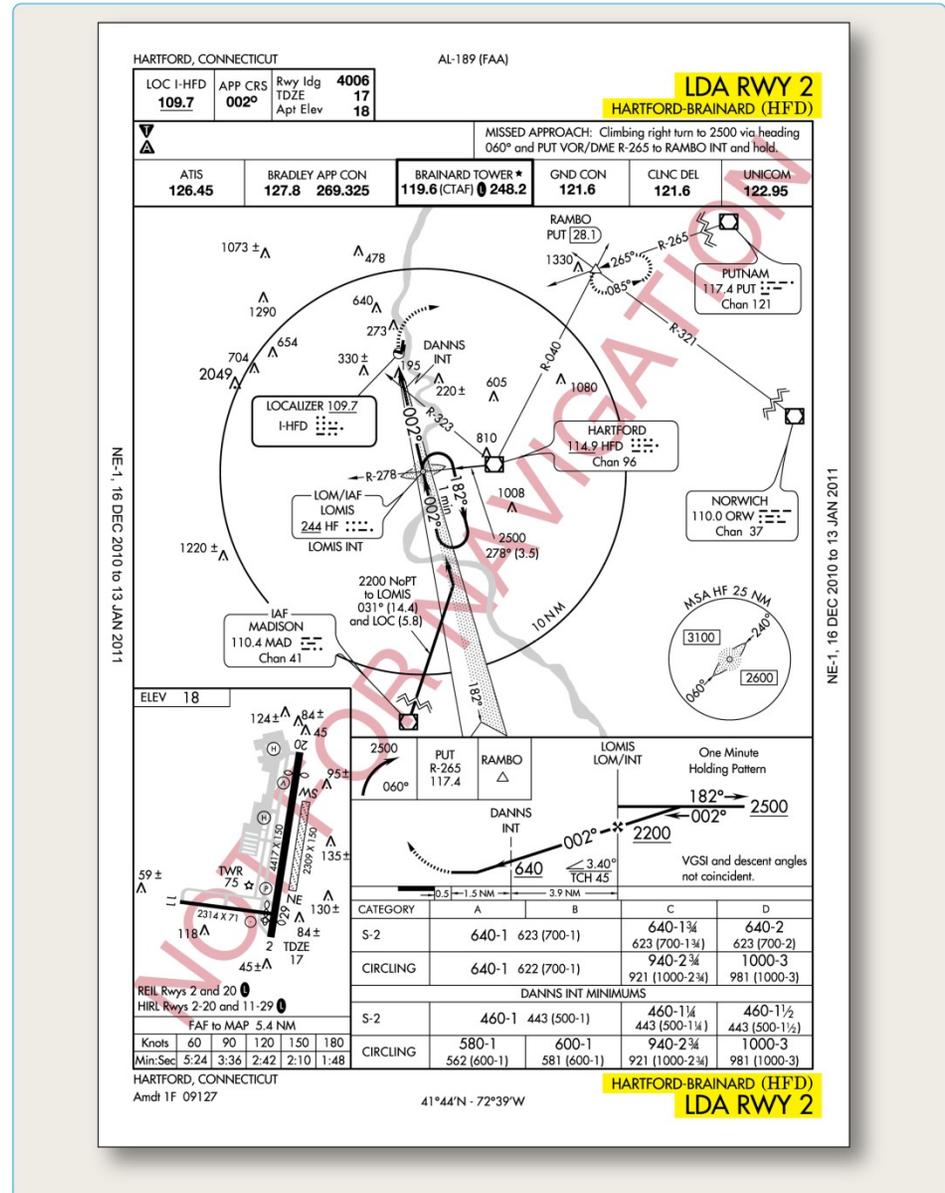


# Other Non-Precision Approaches

## Localizer-Type Directional Aid (LDA)

The LDA is of comparable use and accuracy to a localizer but is not part of a complete ILS. The LDA course usually provides a more precise approach course than the similar simplified directional facility (SDF) installation, which may have a course width of  $6^\circ$  or  $12^\circ$ .

The LDA is not aligned with the runway. Straight-in minimums may be published where alignment does not exceed  $30^\circ$  between the course and runway. Circling minimums only are published where this alignment exceeds  $30^\circ$ . Because the final approach course is not aligned with the runway centerline, additional maneuvering is required compared to an ILS approach.

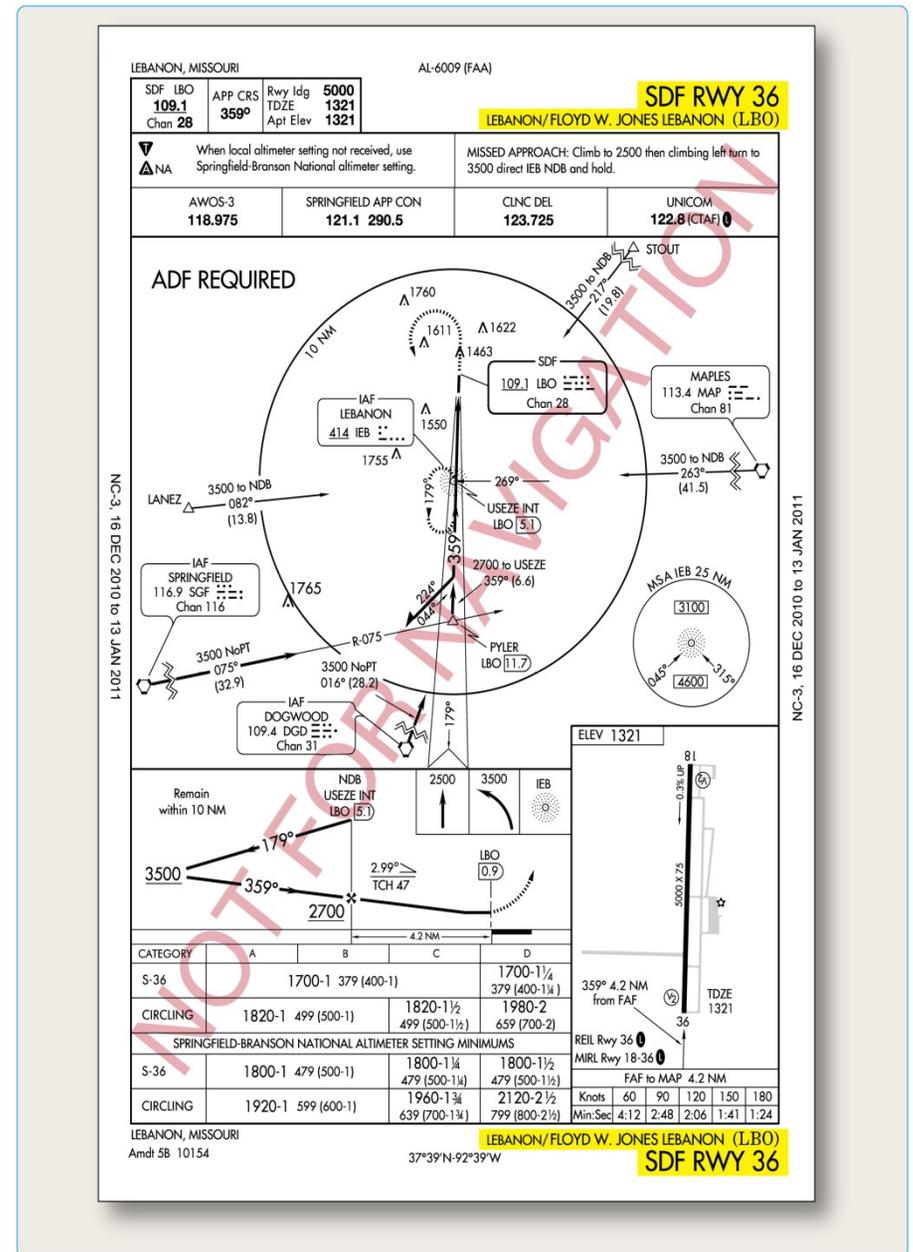


# Other Non-Precision Approaches

## Simplified Directional Facility (SDF)

The SDF provides a final approach course similar to that of the ILS localizer. It does not provide glideslope information.

The approach techniques and procedures used in an SDF instrument approach are essentially the same as those employed in executing a standard localizer approach except the SDF course may not be aligned with the runway and the course may be wider, resulting in less precision. The final approach is provided a minimum of 250 feet obstacle clearance for straight-in approaches while in the final approach area, which is an area defined for a 6° course: 1,000 feet at or abeam the runway threshold expanding to 19,228 feet (10 NM) from the threshold. The same final approach area for a 12° course is larger. This type of approach is also designed with a maximum descent gradient of 400 feet per NM, unless circling only minimums are authorized.



## NDB and VOR Approach Summary Checklist

- VOR and NDB approaches primarily fall into two categories – those that use an on-airport facility and those with an off-airport facility. On approaches with on-airport navaids, the FAP often serves as a FAF.
- Preparation to fly an approach should begin well before flying the procedure. Determine which approaches are in use or likely to be in use at the destination airport, and review the approach procedures as early as possible. Obtain weather information, if possible, for the destination airport and analyze whether a successful approach is likely.
- ATC may clear you to fly the approach of your choice, but they will more likely clear you for a specific approach.
- A published procedure turn or similar course reversal is mandatory unless you are vectored to the final approach course by ATC, or unless your particular approach transition indicates NoPT. Typically, you accomplish a course reversal by flying outbound for 2 minutes, turn to the charted heading 45 degrees left or right of the outbound course and flying for one minute, then making a 180 degree opposite direction turn back to re-intercept the inbound course
- When cleared for the approach, you generally should descend promptly to the minimum altitude published for your current route segment or approach transition, or other altitude assigned by ATC.
- Complete your before landing checklist prior to the FAF, or if there is not FAF, before intercepting the final approach course.

## NDB and VOR Approach Summary Checklist

- Make sure you know what rate of descent is required to reach stepdown altitudes or the MDA by the appropriate time.
- If you do not have the runway environment in sight when reaching the MAP, or if you lose sight of it at any time while circling, it is imperative that you immediately execute the missed approach procedure.
- When executing a missed approach, notify ATC, and, depending on the circumstances, request a clearance to fly the approach again, or request a clearance to your alternate.
- DME is required on certain approaches that indicate DME in the procedure title. Even on those approaches that do not require DME, using DME to identify stepdown fixes may allow lower minimums.
- NDB approach procedures are similar to VOR approaches. However, the precision with which you complete the approach is dependent on your skill in ADF tracking and on the accuracy of your heading indicator.

# Phase II Examination

Next time we will have your 2nd of 4 examinations. Phase II will test on all materials covered since the Phase I Examination.

**Departure Charts and Procedures**  
**Enroute Charts**  
**Enroute Procedures**  
**Holding Procedures**  
**Arrival Charts and Considerations**  
**Approach Considerations**  
**Approach Charts and Considerations**  
**GPS Approaches**  
**ILS Approaches**  
**VOR-DME Approaches**  
**NDB Approaches**