

Apollo GPS Database Addendum

This document includes information that has been added to the waypoint database after the printing of the user's guide. A new waypoint type has been added to your database that is based on the location of a DME antenna. This waypoint is only intended for use in IFR approaches. Insert these pages at the end of the Approach Examples, or other appropriate, section in your Apollo GPS user's guide.

A full description of the limits and uses of GPS receiver distance information to replace DME information is available in updated editions of the Aeronautical Information Manual (AIM) and Advisory Circular AC 90-94 titled "Guidelines for using global positioning system equipment for IFR en route and terminal operations and for non-precision instrument approaches in the U.S. National Airspace System." Your Apollo GPS meets all of the requirements for substituting GPS distance information for DME data.

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UPS Aviation Technologies



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UPS Aviation Technologies, Inc.
Consumer Products Division
2345 Turner Road, S.E.
Salem, OR 97302

U.S.A. Toll Free	800.525.6726
Canada Toll Free	800.654.3415
International	503.391.3411
FAX	503.364.2138

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Using the LOC-DME Waypoint

The Apollo GPS may be used to identify waypoints that require DME distance information on an instrument approach by using the LOC-DME as a destination waypoint. The waypoint type is labeled “LOC-DME,” which stands for the Localizer-DME pair. Be careful when using this waypoint as the Localizer location and the DME location are often in separate locations. Also, the accuracy of the position of the DME waypoint depends on the accuracy of the information provided in the database. Your Apollo GPS will use the DME location as the waypoint. Do NOT use the DME location for course guidance. You cannot activate an approach to a LOC-DME waypoint, because it is not an airport.

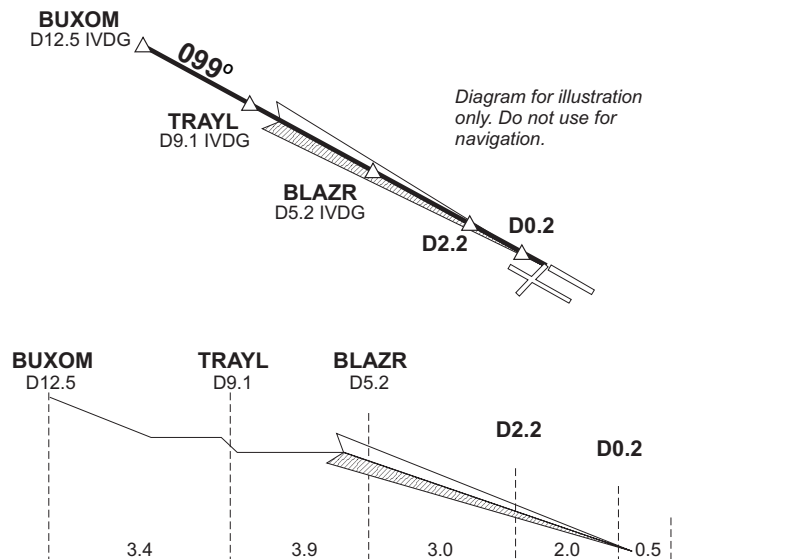
You may use the LOC-DME waypoint as a guide to identify DME-defined points on your approach and as a distance reference point for a step-down approach. The distance value will be accurate, but the internal CDI will point to the DME antenna location, not necessarily the runway centerline. Use your Nav receiver for Localizer and Glideslope course guidance. Use your Apollo GPS for distance information to supplement your DME.

The LOC-DME will appear in the intersection category when you perform the emergency search function.

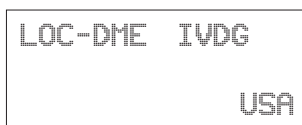
The following examples of typical approaches illustrate where the LOC-DME waypoint may be useful. In addition, examples using DME information from VOR waypoints are given.

ILS with DME Data from ILS DME Antenna

The following example uses the ILS Rwy 10L approach to Portland International airport. This procedure describes the use of your Apollo GPS distance display to supplement the DME distance as you reach the BUXOM intersection.



1. Prior to intercepting the localizer, or before reaching the BUXOM intersection, set up your Apollo GPS with IVDG LOC-DME as a waypoint.
2. Press **DIRECT-TO**. Select the IVDG LOC-DME waypoint using the **LARGE** and **SMALL** knobs, and then press **ENTER**.



The Apollo GPS CDI may not be aligned with the approach course, only the Nav receiver may be used for course guidance.

3. Press **NAV** on the Apollo GPS to display distance. Note the distance to the IVDG DME to identify the intersections TRAYL (D9.1 IVDG), BLAZR (D5.2 IVDG), D2.2 stepdown, and, D0.2. Note that if you enter the step-down waypoints into a flight plan, the ILS bearing is 99° while the bearing shown to the VOR-DME waypoint is 101°. This difference occurs because the actual physical locations for the DME antenna and the localizer antenna are different.

```

ETE L IVDG 01:54
0.004 Δ
BRG 101↑ 5.65NM
    
```

**DME Data
from ILS with
Procedure
Turn**

This example uses the ILS DME approach to Rwy 21L at Prescott, Arizona.

1. After reaching the Drake (DRK) VOR, continue to the HUMTY intersection to intercept the outbound localizer course using your Nav receiver for course guidance.
2. Before commencing the approach, press **DIRECT-TO**. Select the IPRC LOC-DME waypoint using the **LARGE** and **SMALL** knobs, and then press **ENTER**.
3. Press **NAV** on the Apollo GPS to display distance. Use your Apollo GPS for DME information to identify the D10.1 point and the HUMTY (D7.2) IAF intersection.

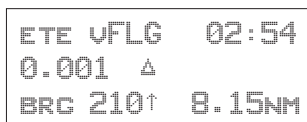
```

ETE L IPRC 02:08
0.000 Δ
BRG 209↑ 7.17NM
    
```

**ILS DME with
DME Data
from a VOR
on the Field**

This example uses the ILS DME approach to Rwy 21 at Flagstaff, Arizona. The DME is co-located with the VOR.

1. Before commencing the approach, press **DIRECT-TO**. Select the Flagstaff (vFLG) VOR/DME waypoint using the **LARGE** and **SMALL** knobs, and then press **ENTER**.
2. Use your Nav receiver for Localizer and Glideslope guidance.
3. Press **NAV** on the Apollo GPS to display distance. Use your Apollo GPS for distance information instead of your DME to identify the SHUTR (IAF) intersection at D7.5, the D5.5, and the D1.0 points.



**VOR DME
without GPS
Overlay**

This example uses the Portland, Oregon VOR DME Rwy 21 approach. You arrive at this approach by going from the Battleground (BTG) VOR to the REENY intersection, making a procedure turn, and then following the 215 radial to the PDX VOR. Use your Nav receiver for course guidance and your Apollo GPS for distance information.

1. After reaching the BTG VOR, use your Nav receiver to follow the 061 radial to REENY, and complete the procedure turn.
2. After completing the procedure turn, set your Apollo GPS to follow the 215 radial to the PDX VOR. Press **DIRECT-TO** twice. Select 215 to the (vPDX) VOR/DME waypoint using the **LARGE** and **SMALL** knobs, and then press **ENTER**.

The Apollo GPS CDI may not be aligned with the approach course, if the magnetic variation has changed since the VOR station was commissioned. Only the Nav receiver may be used for course guidance.

3. Press **NAV** on the GPS to display distance. Use your Apollo GPS for distance information to identify the REENY (IAF) intersection at D20.0, the D16.0, D13.0, D9.0 points, and the SOOZN (D5.0) intersection.

OBS DTK: 215° TO
PDX VOR MAN
BRG 217 DTK 215

VOR DME with GPS Overlay

This example uses the Sunriver, Oregon VOR DME Rwy 18 Sunriver GPS overlay approach. This approach has a GPS overlay. So, in this case, you may use your Apollo GPS for distance information instead of the DME, while using the Nav receiver for course guidance.

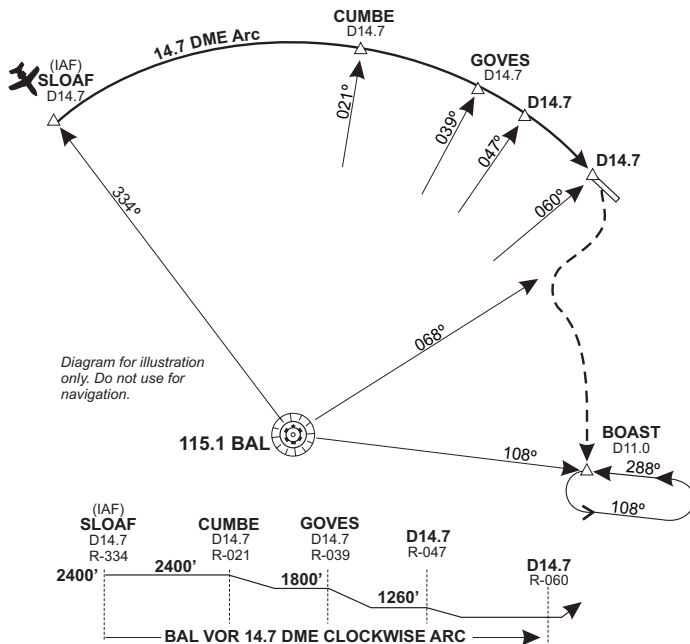
1. Select S21 (Sunriver) as the destination waypoint.
2. Press **SELECT** and then **ENTER** to load the approach.
3. Fly the approach as you would any other GPS approach. The waypoints will sequence appropriately.

Or

1. Use the Nav receiver for course guidance.
2. Press **DIRECT-TO**. Select the VOR-DME waypoint using the **LARGE** and **SMALL** knobs, and then press **ENTER**.
3. Press **NAV** on the GPS to display distance. Use the Apollo GPS to monitor DME information to identify FORRS (D13.0), CERAB (D18.0), and the missed approach point (D23.0).

DME Arc Example

The following example uses Baltimore’s VOR DME 15 to demonstrate the approach to Martin State Airport. The approach uses a 14.7 DME clockwise arc to guide the aircraft to Runway 15.



1. Before reaching SLOAF, tune the Nav receiver to the Baltimore VOR. Intercept and follow Baltimore’s 334° radial (154° bearing) until you reach SLOAF.
2. In your Apollo GPS, select the BAL VOR as the destination waypoint.
3. Prior to SLOAF, start a turn to approximately 064° to intercept the published arc.
4. On the Apollo GPS, read the bearing to the BAL VOR. Adjust the aircraft’s bearing so the right wing aligns with the bearing to the VOR. In other words, just plant your right wing on the bearing to BAL as displayed by the GPS and hold the arc.

If the distance drifts lower than 14.7, widen the turn a few degrees by turning left. If the distance drifts higher than 14.7, tighten the turn a few degrees by turning right.

5. Dial the 021° radial on you Nav receiver to identify the CUMBE intersection, when the Nav CDI centers on the 021° radial.
6. Likewise, identify the GOVES intersection on the 039° radial, the next (D14.7) stepdown on the 047° radial, and the missed approach point at the 060° radial.
7. To execute the missed approach, intercept the 068° radial until reaching 12 nm from BAL as indicated on the Apollo GPS.
8. Turn left to intercept the 11 DME arc by planting your right wing on the GPS's bearing and adjusting your turns as necessary to hold the 11 DME arc.
9. Dial in the 108° radial on your Nav CDI. When the CDI centers, you are located at the BOAST intersection. Turn left to 108° and time your outbound travel for one minute.
10. Intercept the 288° radial to the BAL VOR for your inbound turn. When the GPS indicates 11 DME to BAL, you are at the BOAST intersection. Continue to hold as necessary.

**Available
Waypoint
Information**

The following information has been added to the database to describe the LOC-DME waypoint type. Use the waypoint INFO function to get this information. Refer to your user's guide for instructions on accessing and using waypoints.

LOC-DME Waypoint Information

- Identifier, name, & country
- Bearing and distance from present position
- Map
- Lat/Lon coordinates
- Sunrise/sunset time
- Waypoint comment

