GPS in Lieu of DME for Non-Precision Approaches

INTRODUCION The trend is to equip aircraft with IFR rated GPS navigators and leave out the DME. But then how do you fly VOR/DME approaches. If the title of the approach contains GPS or (GPS) then you can fly it GPS all the way. But without GPS in the title it's a VOR approach and without DME you are restricted to the No DME minimums.

The FAA recently issued a policy statement that enabled pilots with an IFR certified GPS with a current data base to use GPS data in lieu of DME distance. The main requirement being that you must be able to call up the facility (VOR/LOC) containing the DME from your navigators database.

PROCEDURE The procedure for this is a bit more complicated. The following is list of the requirements.

- The receiver must be certified for IFR operations and be installed and approved in accordance with FAA guidelines.
- When using GPS course guidance; i.e., navigating to/from an NDB or locator outer marker (LOM), the course deviation indicator (CDI) must be set to 1 nm or *terminal* sensitivity.
- The required integrity for these operations must be provided by at least en-route receiver autonomous integrity monitoring (RAIM), or an equivalent method. Although currently not available, Wide Area Augmentation System (WAAS) receivers will also be eligible for the substitution.
- Pilots must conduct GPS operations within the guidelines contained in the aircraft flight manual supplement or approved operations manual.
- The DME, ADF, or intersection names or identifiers must be retrieved from the database, and pilots must ensure that data is current in accordance with the aircraft flight manual supplement or approved operations manual.

The second requirement – which calls for the CDI must be set to 1 nm full scale sensitivity will be automatic, provided that you are within the terminal area (less than 30 nm from the airport) and an approach for that airport has been *loaded*. In case the CDI sensitivity has not switched you my force it (in the KLN94) by going to the NAV 1 page as shown below:

Press the **CRSR** button to highlight the full scale sensitivity number. Use the inner knob to select 1.0. Turn the **CRSR** off by pressing it again.

Note that you cannot set the sensitivity to a value that is less (bigger number) that was automatically set by the system.

The use of GPS data for distance includes arc approach segments so long as the facility containing the DME that establishes the arc radius is recalled from the database. Flying a VOR, LOC, ILS still requires

using the VOR or LOC as the primary signal for lateral guidance. Therefore, you need to make sure the CDI or HSI is connected to the VOR/LOC receiver rather than the GPS receiver.

Be careful that you call up the VOR/LOC from the GPS database containing the DME rather that the named approach. Finding the VOR in the database is straight forward. But find the localizer site containing the DME may not be so easy, or even possible in some receivers. You'll need to locate the Ixyz, where I is the prefix and xyz the name of the localizer. If it's not in the database you cannot use it.

Finally you must be configure the GPS receiver to use the facility with the DME as the *Direct to* waypoint.

LIMITAIONS There are three significant limitations that you need to be aware of.

1. NDB approaches that do not have an associated GPS overlay approach must still be flown using an ADF.
2. A *non*-GPS approach procedure must exist at the alternate airport when one is required to be filed by regulation. If the non-GPS approaches on which the pilot must rely require DME or ADF, the aircraft must be equipped with DME or ADF avionics as appropriate. GPS substitution for DME/ADF is not permitted in this case.
3. DME transmitters associated with a localizer may not be retrievable from your GPS until the manufacturer incorporates them in the database. Pilots are not authorized to manually enter coordinates.

This means that if an Alternate is required for your IFR flight plan it must have a non-GPS approach and you must be equipped to fly it as it stands. In this case you cannot substitute GPS data for DME.

SUMMARY You may substitute GPS data for DME, but be careful when you do so. On GPS approaches you expect the distance information to count down to the next fix. When you configure GPS rather than DME you may find the distance counting up to the next fix. Carefully review the approach and pay particular attention to the location of the DME facility and how the distances will be recognized on the paper chart.   Expect to lose some of the situation awareness of the GPS moving map since the display will be showing the *desired track* to the facility not you progress on the approach.