

Flying the Arc with GPS: Going Beyond the Manual

By Harry Kraemer

DME arcs made easy! That is what the manufacturers tell you when describing arcs in their manuals. However, a few surprises await. Using a GPS for a DME arc does reduce the workload for the pilot. You don't have to identify any navigation aids or dial in any radials along the approach. Basically, once you have the approach loaded, fly the needle.

DME Arcs will only be overlay approaches. An overlay approach is an existing approach that may be flown with GPS.

A Phase III overlay approach will include "or GPS" in the title of the procedure. With a Phase III approach, neither the aircraft traditional avionics nor the ground-based navaids need to be operational or monitored to fly the procedure. In AC 90-94, the FAA recommends that, when requesting an approach that can be flown with GPS or ground-based navaids, you should request either the GPS

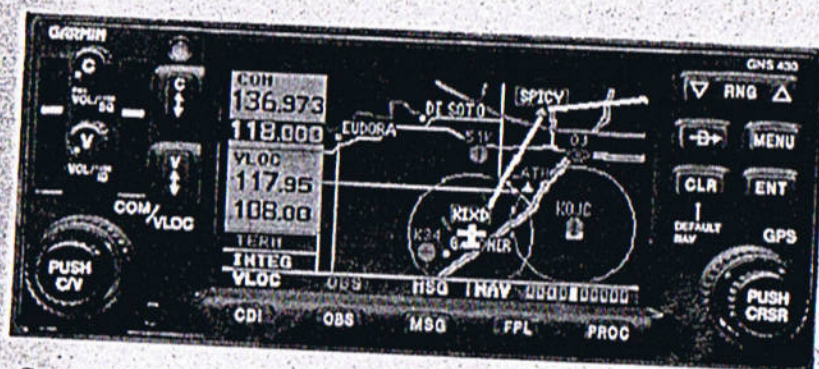
RWY 8 or the VOR RWY 8. I have always recommended that you should request the approach as "VOR RWY 8 with GPS" (or something similar to that) so that the controllers know you are using GPS or ground-

based navaids. This eliminates any confusion about what approach you were flying. An airport may have both a "VOR or GPS RWY 8" approach and a stand alone "GPS RWY 8" approach, each one is a very different

approach. (A stand alone approach is not overlaid on an existing approach.) A stand alone GPS approach often will have a lower MDA than an overlay approach to the same runway.

As approach certified GPS units became more popular and more pilots started flying GPS approaches, the FAA decided that there would be only one GPS approach to a runway. With your spring 1999 GPS updates, you will find that we lost some approaches in the box. Controllers were getting confused as to which approach the pilot was asking for (this is when the FAA decided on only one GPS approach per runway).

The first GPS we will review will be the Bendix/King KLN 90B. The first step when doing an approach is to have the airport (the one where you are doing approaches) dialed in the airport page, which will give you fast access to all GPS approaches for that airport. You may access the approaches from the ACT page 8 (if your designation airport is the



The Garmin GNS 430.

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active waypoint). However, once you load an approach into your flight plan and start the approach, you will not have access to any approaches unless you go to the airport page and dial in the approach airport identifier. Having the airport identifier already dialed in the airport page will save this step (during a high workload time) if ATC changes the approach or you miss and want to try a different GPS approach.

To load the approach, you must go to the APT page 8 or the ACT page 8 (as described above). Depending on the approach, you will see one or more IAFs. Some of the IAFs may be obvious and appear on the plate and some may not. The beginning of the arc may be an IAF appearing as D050J-i. The "D" means DME arc. The 050 is the radial, and the "J," the 10th letter of the alphabet, means a 10-mile DME arc.

The FAA is in the process of changing all fixes to the traditional five-letter named. If two or more IAFs appear, you will have to select the one that is appropriate for your location. If you are outside the radial that defines the beginning of the arc, the unit will default to the beginning radial. If you are inside this radial, the GPS will make up an IAF, based on the radial that the aircraft is on at the present time (this is called intercepting the arc). This will appear as D360J-i, meaning a 10-mile DME arc IAF on the 360-degree radial.

The surprise comes when ATC (or for any other reason) tells you to go to the IAF on the plate, i.e., the beginning of the arc. You can't get there from here. Yes, you can; however, it is not fast and easy. You will have to use the DIRECT button and dial in the fix. After arriving at the fix, and once you are outside of this fix, you will have to load the approach again and replace the existing approach. At this time, the unit will allow you to go the IAF on the plate. You can go to the APT page 8 to have access to the approach (this is why I always have my destination airport in here) or scroll up on the FPL page to the top and change the approach there. The KLN 90B

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does not allow you to edit the approach on the FPL page.

The Northstar M3 gives us the option of going to the published initial approach fix without going through a lot of button pushing. Using the large primary knob to select APCH, then using the large secondary knob to display the different levels, Level 1 will allow you to select the destination and ETA. Level 2 will allow you to select an approach and your starting point for the approach. Level 3 allows you to display or select an individual leg or legs of the approach. The M3 will display the level you are likely to need automatically. If you have already selected your destination, the M3 will display Level 2. When flying the approach, the unit will display Level 3.

The M3 will allow you to intercept the arc inside of the initial approach fix (the M3 will not do this automatically like the 90B). Using APCH Level 2, you can select the point at which you wish to intercept the arc. Next, select APCH Level 3 with the large secondary knob. By turning the small primary knob you can display the arc: Fr JONJR To

CD08 230a

This means that a heading of 230 degrees will have you intercepting the arc between JONJR and CD08.

Using the direct button will display: FLY ARC Fr D050K To CD08 230 ACK?

This means that you will intercept the arc on the 050 radial, 10 DME and fly to CD08.

D050K means: D for DME arc, 050 is the radial that you will join the arc on, and K is the 11th letter of the alphabet. Therefore, 11 DME arc.

Press the ACK button to continue and join the arc.

The Garmin GNS 430 uses the same format in naming waypoints as the two previous GPS units. The Garmin, like the Northstar, gives you the option to fly either to the published IAF or to intercept the arc inside of the IAF. The first step is to use the DIRECT button to select an airport or to have an airport as the last waypoint in a flight plan. You will use the PROC button to access the approach. Don't forget to activate the approach when cleared for it!

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