

GPS Feeder Routes

It's important to understand how you'll transition from the en route structure to the approach.

FOR THOSE OF YOU FORTUNATE enough to be using FAA-approved GPS avionics for instrument approach procedures, we have a word of caution to offer about feeder routes.

The conventional wisdom is that stand-alone GPS instrument approach procedures (IAPs) are not approved for stand-alone use without ATC radar monitoring, until passing an IAF waypoint; i.e. the point at which the database string for the IAP begins.

This is not correct. Stand-alone authority begins at the VOR or intersection from which a feeder route, specific to the IAP, begins. VOR navigation should *not* be used along such a feeder route.

The FAA flight inspects only the GPS navigation capability along a stand-alone GPS IAP's feeder routes.

We recently had the opportunity to review a pending GPS IAP for Runway 34 at St. George, Utah (SGU). This IAP has three proposed feeder routes, two of which begin at VOR facilities, and one which begins at an intersection on a Victor airway.

It isn't possible to fly a feeder route from an intersection, other than with GPS navigation. What might not be so apparent, though, is that one of the VOR feeder routes in the SGU GPS IAP does not support VOR navigation because of terrain interference with VOR reception. The feeder route is 72.3 miles in length from Peach Springs VOR to the south (see chart below). Not only would you have unreliable VOR reception at some point along this feeder route, the surveyed and flight inspected protected airspace presumes the desired track is

ous terrain, where flying the procedurally designed track is required to avoid higher terrain adjacent to the feeder route. "Direct to" type navigation can result in "homing" to the IAF, thus failing to capture and track the center of protected airspace.

Because of all the new, sometimes confusing terminology associated with GPS, it's sometimes difficult to separate the wheat from the chaff. We hear all the time that GPS is a "to-to" system of navigation. This is true in the sense that we never navigate from a waypoint because the waypoint behind us is no longer a "nav facility," unlike flying to the midpoint between two VOR stations. Nonetheless, with GPS it's still a "from-to" track when we have properly selected the desired track between two required waypoints. The distance is counting down to the next waypoint, but the required track is the "from-to" track between the waypoint we just passed and the waypoint ahead.

The course described from PGS, 346 degrees magnetic, is based on waypoint-to-waypoint navigation, and the magnetic variation used is that for the airport, not the Peach Springs VOR.

Because feeder routes aren't part of the IAP database string, caution must be exercised to select waypoint-to-waypoint as the desired track, rather than "direct to" the IAF waypoint. This could be critical on a lengthy feeder route in mountain-

ous terrain, where flying the procedurally designed track is required to avoid higher terrain adjacent to the feeder route. If it's engaged prior to that point, fine, but don't let it fail to engage by the IAF. This will ensure increased CDI sensitivity when the initial approach segment lateral limits ramp down from feeder widths to intermediate segment widths.

Although different manufacturers of GPS avionics have their own terminology, and the techniques required to implement waypoint-to-waypoint tracking may differ between different manufacturers' boxes, the concepts we've outlined above are fundamental to the GPS system.

