

# Protected Airspace & Course Reversals

In "Threading the Needle Properly" (September *IFRR*) Wally Roberts indicates that a racetrack procedure turn is legal, but not good practice. In the example used, the aircraft was in a holding pattern within the procedure turn airspace. From the position of the aircraft when cleared for the approach, the racetrack procedure turn was the appropriate course of action, and showed good judgment (but lousy judgment on altitude).

All the extra maneuvering and time required to get back on the outbound radial, and maneuvering for the 45/225 procedure turn doesn't make the course reversal procedure any safer. I know the article was emphasizing areas of safe altitude clearance. However, some readers could read into this that they should always do a 45/225 course reversal, if that's what the chart shows. They might feel that to do otherwise is "un-professional."

Ross A. McLean  
Plattsburgh, NY

Roberts responds: What I said in the article about the use of the "racetrack hold" for course reversal in a standard procedure turn area was: "Although this is legal, it isn't good practice for all situations. Instead, it is better to get on the published course outbound before starting the course reversal maneuver" (emphasis added).

In the case of a highly accurate procedure turn fix, such as where a nav facility is the fix, it's probably acceptable practice to do a "racetrack hold" for course reversal. It could be a real problem, however, at a "fuzzy" intersection fix. Tracking the outbound course not only returns the airplane to the nominal center of the TERPs lateral containment area, it negates the adverse effect of any possible crosswind component. We're required to correct for wind in normal one minute holding patterns, so cer-

tainly we should correct for wind in an extended "racetrack hold" used for a standard procedure turn. Simply stated, to assure containment within procedural airspace, it's more conservative to go for apparent center of the procedural area.

The folks who write this stuff for the AIM don't always have the corporate memory of the intent of some of these criteria. Note the long-standing illustration from the applicable TERPs criteria, Figure 6 (below left). The dotted track outbound is on-course. The framers of these criteria didn't intend to force a 45/225, but they did intend outbound flight to be tracking the course, especially where outbound flight is to last for any appreciable distance.

In "Threading the Needle Properly," it's important to note two excerpts from the current AIM. The first is paragraph 5-4-8 (a) (4): "A procedure turn need not be established when an approach can be made from a properly aligned holding pattern... If cleared for the approach prior to returning to the holding fix, and the aircraft is at the prescribed altitude, additional circuits of the holding pattern are not necessary nor expected by ATC."

The second is from paragraph 5-3-7 (k): "Where the fix is associated with an instrument approach and timed approaches are in effect, a procedure turn shall not be executed unless the pilot advises ATC, since aircraft holding are expected to proceed inbound on final approach directly from the holding pattern when approach clearance is received."

The aircraft described in the article is holding at 9,000 feet. The touchdown zone elevation is 5,021 feet, and the difference is

3,979 feet. If he turns inbound in the holding pattern at three miles from the holding fix, he will have about seven miles to lose the altitude. He can do this at a descent rate of 568 feet per minute.

The pilot should not have descended in the holding pattern as described, but should have clarified his intentions with the examiner who was acting as the ATC controller. He should not have attempted to go out for the procedure turn without ATC approval.

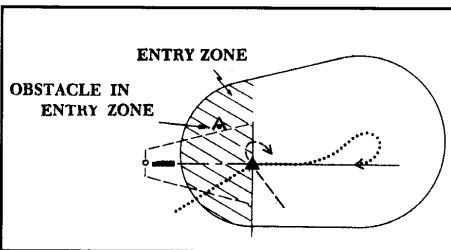
Robert B. Davis  
Hollister, CA

Roberts responds: On the matter of the IAP language in the AIM, Mr. Davis is making a common mistake when he assumes that the "established" in "a procedure turn need not be established" implies some sort of pilot option. The option belongs to the FAA procedures specialist who designs the IAP. Once an IAP is published, any course reversal segment is mandatory for the pilot unless one of the three conditions of FAR 91.175(j) is present.

This mandatory requirement for pilots to execute any published course reversal has always been assumed in TERPs IAP design criteria and was reinforced in November, 1994 by an FAA Chief Counsel official letter of legal interpretation. The relevant portion of that letter stated:

*Finally, you ask whether a course reversal segment is optional "when one of the conditions of FAR section 91.175(j) is not present." Section 91.175(j) states that in the case of a radar vector to a final approach course or fix, a timed approach from a holding fix, or an approach for which the procedures specifies "no procedure turn," no pilot may make a procedure turn unless cleared to do so by ATC.*

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Procedure turn initial approach area (TERPs handbook Figure 6). When proceeding outbound for the procedure turn, the assumption is that you'll be on-course.

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## READERS' ADVISORIES

### Protected Airspace...

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*FAR 97.3 (p) defines a procedure turn, in part, as a maneuver prescribed when it is necessary to reverse direction to establish the aircraft on a intermediate or final approach course. A SIAP may or may not prescribe a procedure turn based on the application of certain criteria contained in the TERPs. However, if a SIAP does contain a procedure turn and ATC has cleared a pilot to execute the SIAP, the pilot must make the procedure turn when one of the conditions of FAR 91.175 (j) is not present.*

The language Mr. Davis cites from AIM 5-4-8 is from Paragraph 234e of TERPs:

*Elimination of Procedure Turn. A procedure turn is NOT required when an approach can be made direct from a specified intermediate fix to the final approach fix. A procedure turn NEED NOT be established when an approach can be made from a properly aligned holding pattern.*

TERPs, Paragraph 234e goes on to ex-

plain to the IAP designer what constitutes a properly aligned holding pattern.

The first sentence of TERPs 234e results in "NoPT" being published for routes that arrive over a specified intermediate fix and the second sentence results in a bold-type holding pattern. The course-reversal holding pattern is always shown in both the plan and profile views of the chart, and is the equivalent of the standard procedure turn.

Similar to his mistaken impression about who "establishes" course-reversals in an IAP, in his second quoted reference, Mr. Davis confuses the special provision of timed approaches as a mistaken impression that the pilot can waive a course reversal. The timed approach is one of three exceptions in FAR 91.175 (j) to course-reversal requirements. Timed approaches are only conducted at an airport with an operating control tower and only when ATC makes it clear timed approaches are in progress.

If ATC has set up timed approaches properly, timed holding pattern altitudes will be compatible with the descent re-

quirements of the IAP, in the same manner as when ATC provides radar vectors to the final approach course.

Mr. Davis' suggests that a pilot should go straight-in, and not do a procedure turn unless clearing it with ATC. That would be true only with one of the three provisions of FAR 91.175 (j), none of which apply in the Prescott example. Further, to go straight in would result in descent gradients considered well beyond the descent gradients permitted in IAP design. 300 ft/nm is the max gradient for the intermediate segment, and 400 ft/nm is the max from the FAF inbound to TDZ elevation for straight-in minimums. Mr. Davis states that a descent rate of 568 ft/nm would result if 9,000 feet were maintained until three miles prior to the FAF. 568 ft/nm is indeed the descent **gradient** from such position, but would be the descent **rate** only with a **groundspeed** of 60 knots. Although there's normally no requirement to cross the FAF at the minimum crossing altitude, being close increases the likelihood of a stabilized approach. —