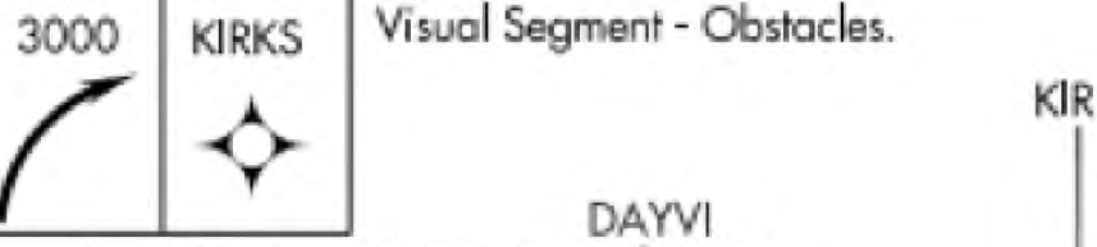


THE VISUAL DECISION POINT

by Matt Johnson

The instrument checkride is undoubtedly one of the most stressful exams that applicants will undergo. It's understandable, the amount of new knowledge that applicants must have digested prior to the examination would leave the sharpest of applicants anxious and apprehensive.

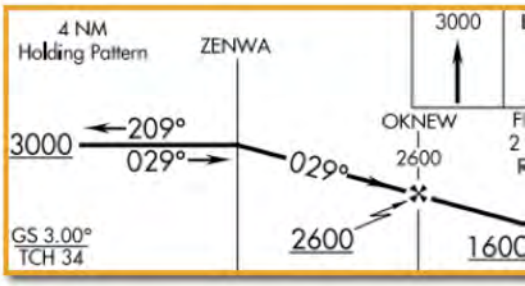
One item that I have found that leaves many applicants with the deer-in-the-headlights look is when I ask about the VDP or the Visual Decision Point. The responses from applicants can range from a nearly correct answer to a full blown stratosphere-away answer.

Understanding the concept of a VDP doesn't have to be difficult, in fact, I would submit to you that the complexities of understanding the VDP are due in part to the shear nature of its simplicity. In other words, the VDP is often "over thought."

A definitive definition for the VDP can be found in the Aeronautical Information Manual. It reads, in part that a VDP is a defined point on the final approach course of a non-precision, straight-in approach procedure from which a stabilized visual descent from the MDA to the runway touchdown point may be commenced. The AIM verbiage continues by saying that the pilot should not descend below the MDA prior to reaching the VDP.

When a VDP is included on a non-precision approach it can easily be identified by a distinctive "V" in the profile area of the approach chart. The VDP is found along the final approach segment of a straight in non-precision approach.

VDP's are in fact navigation references and can be identified by marker beacons, DME or most commonly by IFR approved GPS indications. In the profile view



example provided you will see that the VDP is located 1.1 NM from RW03

WHY THE VDP?

To get an idea of why the VDP is important and exists on many non-precision approaches we need a quick review of a very important regulation. FAR 91.75 is the regulation that gives us the elements necessary to descend below the Minimum Descent Altitude (MDA) and land.

Essentially we must have:

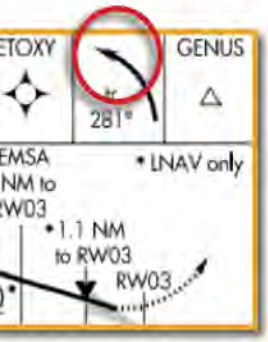
- *The required flight visibility.*
- *At least one of the associated runway environment items visible (threshold, threshold lights, etc.)*
- *The aircraft is in a position from which a landing can be made using normal descent rates.*

It is the last element related to landing using a "normal" descent rate that plays a key part of the VDP concept.

While the exact rate of descent that defines "normal" is often up for debate amongst instrument instructors the FAA does give us guidance on the matter.

The FAA's Instrument Procedures Handbook discusses Maximum Acceptable Descent Rates. The handbook states "Operational experience and research have shown that a descent rate of greater than approximately 1,000 fpm is unacceptable during the final stages of an approach".

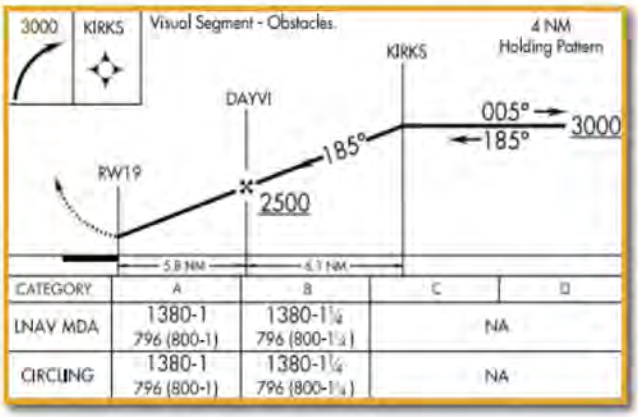
This brings us back to the VDP and its



core definition given above, specifically the part about the VDP being that last point from which a stabilized visual descent from the MDA to the runway touchdown point may be commenced. The VDP provides a 3-4 degree descent gradient; this equates to about 300–400 feet of descent per nautical mile.

It is easy to see why VDP's came about and are paramount for safety. They essentially back up the missed approach point (MAP) to a location on the approach track where you actually have time to descend and land. This is critical as many missed approach points are actually found at the runway threshold; a place from where making a "normal" descent is anything but practical.
Is a VDP an actual missed approach point? No. However, will you be able to make a "normal" descent at the missed approach point (MAP) when it is located at the runway threshold? Not likely; hence the beauty of having a pre-determined location (VDP) of where to begin your stabilized descent.

If at the VDP you don't have your required in-flight visibility and one of the



associated runway environment items visible good prudence says a missed approach should be in order.

MAKE YOUR OWN

For various reasons chart designers aren't always able to implement a VDP. Not to worry! Math so simple that even a pilot could appreciate it is available to give us guidance. For a straight-in, non-precision approach that doesn't have a VDP you can in fact figure your own VDP. Simply take the MDA height above the ground/terrain and divide it by 300.

Let's take a practical look. In the below example you will see that the MAP is located at the threshold of Runway 19. Although not visible on this snapshot the field elevation for this approach (airport) is 584'. The same result you get from subtracting the MDA height above terrain (796) from the MSL MDA (1380). Based on the formula previously mentioned we could simply take the MDA height above terrain of 796, for simplicity we will round it to 800 and then divide by 300. This gives us an answer of 2.6 miles.

In this particular instance an important point to consider is that the VDP may end up (in effect) raising your minimums. So if the published visibility minimum is 1 mile, but the VDP is 2.6 miles from the runway, you really need 2.6 miles of visibility, not 1 mile.

At 2.6 miles from the runway if we had the required flight visibility and one or more of the runway environment items visible we would have enough distance (2.6 miles) to effectively descend on a 3 degree stabilized gradient.

A quick check of the rate of descent table in the back of the Terminal Procedures Publication shows that a ground speed of 90 knots on a 3 degree descent gradient would require a descent of around 475 feet per minute

Compare this realistic rate of descent value to that which would be required when getting to the actual MAP, identifying the runway and diving for it. An autorotational descent isn't exactly going to qualify for a "normal" descent or maneuver for landing.

As alluded to earlier, VDP's don't always exist for an assortment of reasons. So, if you are using the above method or any other methods for estimating your own VDP don't just blindly create your own VDP without making sure you won't be too close to something that will hurt you. Proper due diligence for the approach brief is critical.