

The Circle of Confusion, PART III

by Matt McDaniel

Due to the extended time span since Parts 1 and 2 of this series appeared, a quick review is in order. In Part 1, we discovered that when doing a circling maneuver, Cirrus aircraft actually fall into approach category B rather than Category A, as when flying a straight-in IFR approach. We also learned that Jeppesen and NOS chart these categories with slight differences, with the biggest being Jeppesen's addition of a speed notation for each circling category. Finally, we were reminded that circling minimums are expressed in Height Above Airport (HAA), how to define our circling radius, and that the radius will typically be 1.5NM, for a Category B circling speed. In Part 2, we discussed the differences between circling approaches at towered and non-towered airports. Also detailed were the many decisions that are left up to the PIC when circling, and how best to use your knowledge to anticipate and deal with those issues safely, especially when circling at a non-towered airport. With Parts 1 and 2 as the foundation, the following installment will conclude this discussion on circling approaches.

The Straight-In, Circling Approach

Obviously, the title of this section is nonsensical but so is the reality that it refers to. Especially, the many situations where ATC assigns, or the pilot chooses, to land straight in from a circle-to-land-only approach. First, a reminder: In order for an approach to qualify for straight-in minimums, it must be aligned within 30 degrees of the runway heading and it must allow the pilot to leave MDA and descend to land visually, using *normal procedures and maneuvers*. When an approach cannot meet both of these criteria for any runway on the airport, it is considering a circling-only approach and will be named without reference to any specific runway (i.e., GPS-A, LOC-B, VOR-C, etc.). These are considered approaches to an *airport*, not to a *runway*.

The confusion comes in when an approach is very closely aligned with a specific runway, yet is still labeled as an Alpha, Bravo (or other lettered) approach. This is because, even though

the approach might be aligned within 30 degrees of a given runway, it is not designed in a way which would allow a descent to landing using *normal procedures and maneuvers*. Generally, this simply means that the required glidepath and descent rates are too steep, because MDA is too high and/or too close to the approach end of the runway. However, this does not stop some controllers from assigning, and many pilots from accepting, a straight in approach and landing clearance to said runway. A good example of this is the VOR or GPS-A approach into SMO (see Figure 6).

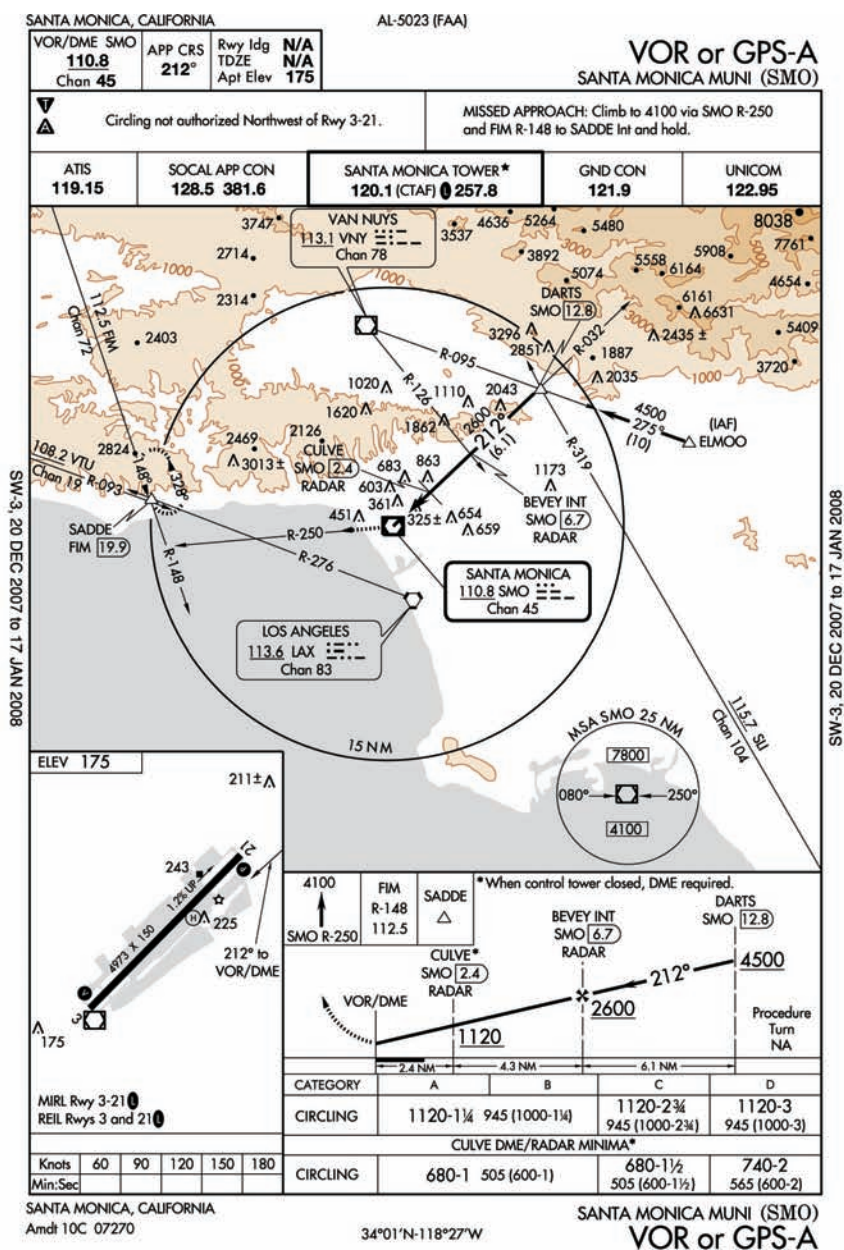


FIGURE 6
Circle-to-land or attempt to approach and land straight-in to runway 21?

For many reasons related to workload, overlapping airspaces, traffic flows, noise issues, etc., ATC routinely assigns this approach as a straight-in to Runway 21. SMO is not unique in this respect. Similar approach situations can be found at airports around the country. It is obvious that this approach is closely aligned with Runway 21; however, there are no published straight-in minimums due to the high MDA and steeper-than-normal descent required. Being able to identify CULVE allows a descent to an MDA of 680 feet (505 feet AGL), but gives only 4.3 miles to descend the required 1,920 feet from FAF to CULVE. At this point, CULVE is only about 1.5 miles from the approach end of runway 21 and note that the missed approach starts at the opposite end of the runway. Obviously, being fully configured early, fully briefed, and mentally prepared in advance, is necessary. Many pilots aren't, and find themselves too high, too fast, and too close to the runway to have any hope of landing straight in. In an approach situation like this, the key is to never blindly agree to ATC's instructions. If you are not prepared to execute such a non-standard approach procedure, you must be the PIC and tell ATC you intend to circle in order to fly a more stabilized approach. Considering the approach does not even publish straight-in minimums, the controller can't force you to accept a straight-in clearance.

Circling From Overhead, Special Notes, Night Hazards and "NA"

The final unique circling approach I will highlight is the type that leaves the pilot high above the airport and usually well above the pattern altitude at MDA. These approaches are typical at airports that are surrounded by high mountains and/or obstructions. The most extreme examples are in mountain bowls where the airport lies in a deep valley surrounded by high, close, rapidly rising terrain. Since these approaches often include restrictions, notes and night hazards, I will use one example to cover all of those aspects. Refer to Figure 7: Heber City's GPS-A approach has an MDA of 1,903 feet AGL (903 feet ABOVE pattern altitude), which the pilot *should* reach at just over a mile from the runway. Over-flying the field at 36U is not a good option, as both traffic patterns are north of the runway (right traffic for 21), due to the high/close terrain on the airport's south side (*circling south of 3/21 is also specifically not authorized [NA] as per the notes*). Also noted is that this approach is NA at night or without local altimeter setting. Why? Notice that the missed requires you to make a climbing turn that will take

you slightly south of runway 3/21. That area is an unpopulated and unlit mountain side that at night is essentially a black-hole. The terrain there rises rapidly to nearly 3,000 feet above field elevation. Not a good place to be without an accurate altimeter setting either! My point: Read and brief the notes, the devils are in the details.

Assuming you can do this sort of approach within its limitations, you will be faced with the unusual situation of being nearly on top of the airport well above pattern altitude. This harkens back to Part 2 of this series, where we discussed circling at non-towered airports (such as 36U) and blending in with possible VFR traffic in the pattern. In this case you will be *over* those aircraft, and blending into their pattern can be even more difficult. As the higher traffic, you do *not* have right-of-way rules in your favor. So, if a traffic conflict does exist, your safest bet is to circle overhead (at MDA, within the circling radius), until you

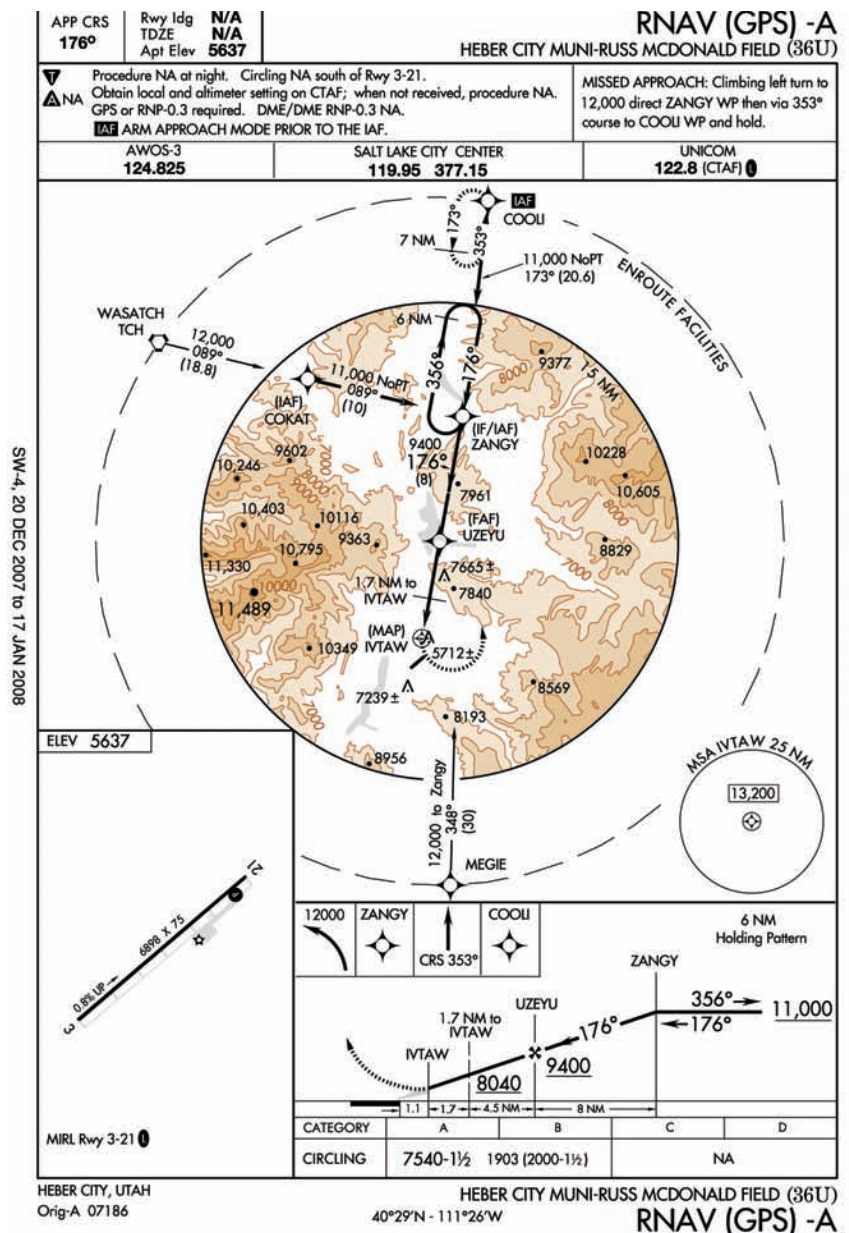


FIGURE 7
A mountain valley airport with a very high circling MDA and many restrictions.

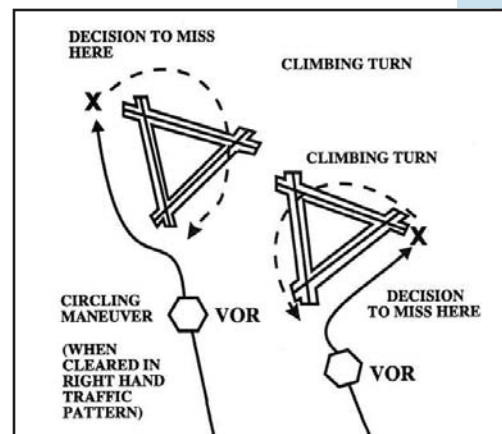
can descend to enter the pattern flow normally. Try to resist the temptation of a “slam dunk” descent, even though you are nearly 1,000 feet high to begin with. Instead, strive to establish a stabilized descent rate of not more than 1,000 fpm and maintain it until you reach your normal descent profile for a visual pattern. Remember, visibility may be marginal (1½ NM is the published minimum) and you must remain within the circling radius of 1.5 NM for Category B. Don’t overload yourself by also heaping on the dangers of a screaming descent rate into the bottom of a mountain valley.

The Missed Approach

Regardless of the type of approach in question, there is always the possibility of being required to go missed. Going missed from a straight-in approach is generally a routine procedure. That is because the missed is nearly always initiated at the published Missed Approach Point (MAP) or prior to it. However, that is not always the case with a circling approach, which can lead to pilot confusion and disastrous results. From the MAP, the procedure for flying the missed approach is spelled out on every approach plate. From a straight-in approach, there is little for the pilot to do inside the MAP, other than flying straight ahead while descending to land. On the other hand, circling approaches are unique in that they require the pilot to transition from instrument to visual reference and maneuver the airplane for landing from an unusual altitude in marginal visibility conditions, all *inside* of the MAP.

The Weather Factor: Ceiling and visibility minimums vary widely for circling approaches. Generally speaking, they are below traditional VFR weather definitions and are usually below MVFR criteria. The point being that the pilot will be utilizing external visual references during maneuvering (circling) flight in conditions that can make such flying very challenging. This is why many airlines and corporate flight departments actually prohibit circling-to-land approaches below basic VFR minimums (1,000 and 3) in their company operations manuals. When circling at the published Minimum Descent Altitude (MDA), the pilot has to fly a fine line between not descending below MDA before the aircraft is in a normal position to leave that altitude for landing, and not climbing above the MDA to avoid re-entering the clouds or losing the required in-flight visibility and outside visual references. The same type of fine line also exists in the horizontal sense. The pilot has to remain close enough to the airport/runway to keep them within sight while staying within the appropriate circling radius. Yet, the pilot has to avoid circling too closely and squeezing the circle in too tightly. This can cause him to be too high, as well as, too close to the runway and may tempt him to bank too steeply and/or dive for the runway to avoid being forced to go missed. The goal is to complete the entire circling maneuver using “normal procedures and maneuvers.”

You Can’t Get There From Here: Even done perfectly, a circling approach can still occasionally lead to an inside the MAP missed approach. The primary danger of that is getting yourself from wherever you happen to be, to being established on a published portion of the Missed Approach. The easiest (shortest) route for doing so is not always the safest route. Regardless of where you are when the decision to go missed is made, one simple fact that should be at the forefront of your mind is that the safest place you can be is directly over the airport. In that position you know, for sure, that you are within the circling radius and, by climbing above MDA as quickly as possible, you are assured of being above any obstructions within that area. Your first instinct (and action) should always be to CLIMB while turning towards the center of the airport (see Fig. 8). Obviously, acute situational awareness is imperative. Once safely above MDA and above the airport, you can begin to determine the simplest way to establish yourself on the published missed approach procedure. If you have the luxury, you should utilize any available help from ATC and Radar Services in becoming established on the published missed, or any alternate procedure authorized by ATC.



IN CONCLUSION

The circle-to-land approach can be a difficult and challenging procedure to master, especially given the wide variety of them available to IFR pilots. However, when done properly, they can also offer a high level of pilot satisfaction and open up a wide variety of airports and runways that would otherwise be unavailable on IFR days. Additionally, there are countless situations where the circle-to-land approach is not only the best option; it is the *only* option for a particular airport and a particular time. When training and studying to stay proficient, this is one area you should strive to practice often. Get with your favorite CSIP and see if you are as proficient at circling approaches as you’d like to be. **COPA**

About The Author: *Matthew McDaniel is a Master & Gold Seal CFII, ATP, MEI, AGI, IGI and CSIP. In 18 years of flying, he has logged over 9,500 hours total and over 4,000 hours of instruction-given. As owner of Progressive Aviation Services, LLC (www.progaviation.com), he has specialized in Cirrus instruction since 2001. He’s also an airline pilot, currently flying the Boeing 717, and holds four turbine aircraft type-ratings. Matt can be reached at: matt@progaviation.com or (414) 339-4990.*