


The following pages are from Pilot Workshop's [IFR Procedures](#) Manual

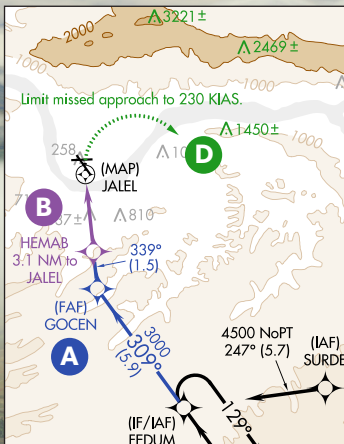
IFR Procedures

A Pilot-Friendly[®] Manual

Circling to Rwy 7, 31 NA at night. When local altimeter setting not received, procedure NA. Circling NA for Cat D north of R and northeast of Rwy 31. DME/DME RNP-0.3 NA. C

RNAV (GPS)-A
COLUMBIA GORGE RGNL/THE DALLES MUNI (DLS)

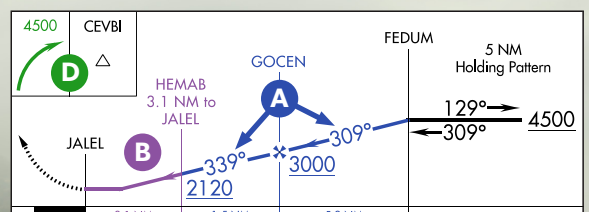




Limit missed approach to 230 KIAS.

4500 NoPT 247° (5.7) (IAF) SURDE

(IF/IAF) FEDUM 5 NM



CATEGORY	A	B	C	D
C CIRCLING	1320-1¼ 1073 (1100-1¼)	1340-1½ 1093 (1100-1½)	1720-3 1473 (1500-3)	2100-3 1853 (1900-3)

A handy guide to help you review, understand, and fly IFR procedures with confidence.

Land Via a Circle-to-Land



Circling can mean anything from a normal traffic pattern at the end of an approach to a death wish in the dark.

1. Consider the risks and set minimums.
2. Get a clearance.
3. Plan the circling pattern.
4. Break off the published approach and circle.
5. Remain within protected airspace.
6. Descend below MDA and land.

Consider the Risks and Set Minimums

Circling approaches (aka, circle-to-land) have a terrible record of fatal accidents. So much so that commercial operators and airlines often prohibit circling.

This is no surprise if you consider circling minimums can be as low as 400 feet and 1 SM. Low-level maneuvering less than 400 feet AGL with 1 mile of visibility is clearly high risk. And at night? Forget it.

On the other hand, what if the weather is good enough you could fly an approach to one runway until breaking out at 1400 feet AGL and then entering a visual traffic pattern at 1000 feet AGL for another runway? That's also a circling approach.

Clearly, putting all circling approaches into a single bucket is seriously limiting. It's not wrong, but it's worth considering where the line is for you and your aircraft. If you're going to circle, consider setting personal minimums. A good starting point is visibility and ceiling high enough you'd be willing to fly a VFR traffic pattern. Lower than that: straight-in approaches only.

Get a Clearance

At towered airports the approach clearance will specify it's a circle-to-land, usually with the direction to circle: "... cleared RNAV Runway 9 approach, circle-

to-land Runway 27." The Tower will usually tell you which way to circle: "Circle south for a left downwind Runway 27." At non-towered airports, a simple approach clearance is enough—ATC generally doesn't care if you plan to circle or land straight-in.

Plan the Circling Pattern

Suppose you're on approach to Runway 27 at a towered airport, planning a circle-to-land on Runway 36. Tower tells you to, "Circle east for a right downwind for Runway 36." Before you accept the instruction, make sure it works for you. If the visibility is low or you expect to break out too close to the airport to enter a downwind before crossing the airport, tell Tower you'd like to cross overhead and enter the left downwind instead. They'll authorize that if able.

At non-towered airports, it's up to you to determine the best circling direction and pattern. However, that doesn't necessarily mean you have a choice. There are three things you must check, and they go in priority order.

The first is any prohibition on circling per the chart for the approach you're using. Clearly, you can't fly an approach to Runway 35 with plans to circle for Runway 17 if there's a note saying, "Circling Rwy 17 NA." You also can't if the conditions don't allow it, such as "Circling Rwy 17 NA at night." There may be a prohibition on the direction of circling, such as "Circling NA east of Runway 17." In this case, the only option per the chart is circling with a right downwind for Runway 17.

The second item is the traffic direction at the airport. When approaching to land at a non-towered



Use a moving map with terrain and obstacle alerts for the circle-to-land for both hazards and orientation to the runway in reduced visibility. Cross-track error (XTE) is also useful. If your circling area is 1.5 NM from all runways, staying within 1.5 NM of the straight-in approach course **A** while flying downwind is within the protected area.

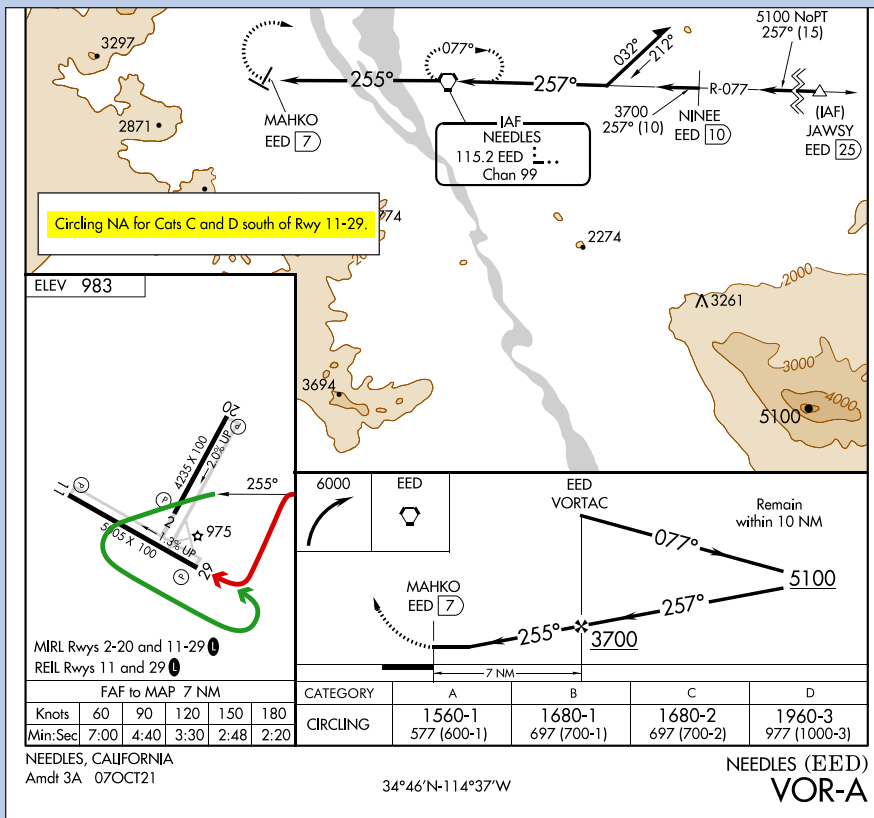
airport in Class G airspace (no Class E surface area), 14 CFR 91.126(b)(1) says “each pilot of an airplane must make all turns of that airplane to the left unless the airport displays approved light signals or visual markings indicating that turns should be made to the right.” That regulation still applies under IFR. Several FAA Legal Counsel Interpretations have upheld that pilots must turn in the normal traffic direc-

tion when circling—even if conditions favor circling opposite the published traffic direction.

What if the approach chart prohibits circling where the Chart Supplement says the normal traffic pattern should be? (See “Circling Pattern Example: Wausau, WI (KAUW) RNAV (GPS) 13, Circle to Rwy 31” on page 114.)

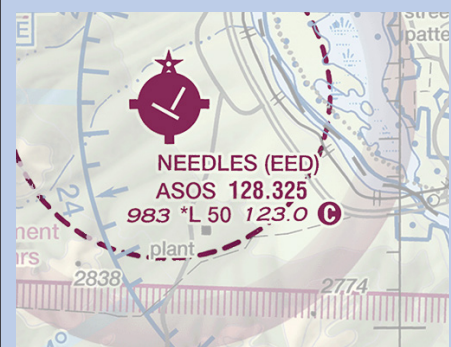
The third item is your preference given the conditions. A common error during circling approaches is overshooting the base-to-final turn. If you’re landing on a crosswind runway and have a choice, pick the pattern that offers a headwind on base leg. That will give you the lowest groundspeed to decrease radius of turn. You may not have an option on this, which

CIRCLING PATTERN EXAMPLE: NEEDLES, CA (KEED) VOR-A, CIRCLE TO RWY 29



It might seem natural to enter a right base upon spotting the runway here (red path), but don’t do it. Runway 29 has a standard left-hand traffic pattern.

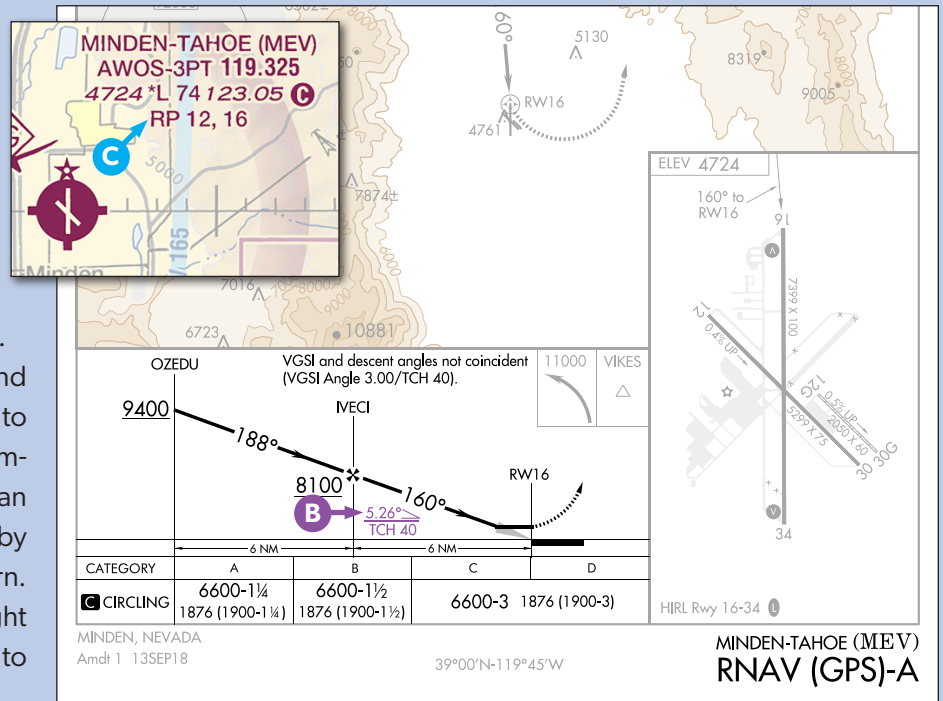
Your best move is to overfly the airport and enter a left downwind (green path). That’s a problem for Category C and D aircraft, who are prohibited from circling south of Runway 11-29.



CIRCLING PATTERN EXAMPLE: MINDEN, NV (KMEV) RNAV (GPS)-A, CIRCLE TO RWY 16

There's nothing that says a circle-to-land must include turns and Runway 16 is basically straight-in. The name of the approach reveals the problem. This is the RNAV (GPS)-A rather than the RNAV (GPS) Rwy 16 because the descent angle from the FAF to Runway 16 is 5.26° **B**.

Depending on your aircraft and the conditions you might be able to land straight in. A safer, more comfortable plan would be entering an upwind for Runway 16 followed by an essentially normal traffic pattern. Runway 16 has a published right pattern **C**, so make those turns to the right.



is why it's third in the priority list. But if your base-to-final turn is with a tailwind, help yourself out by planning a wider pattern within the protected area to help ensure you don't overshoot final.

Break Off the Published Approach and Circle

You can leave the final approach course to begin the circle once the airport is in sight and you're within the protected circling airspace. (See "The Protected Area is Bigger Than You Think" on page 115.) The airport—but not necessarily the landing runway—must remain in sight throughout the circling maneuver.

The only exception per 14 CFR 91.175 (e) is if "... the inability to see an identifiable part of the airport results only from a normal bank of the aircraft during the circling approach." Otherwise, if you lose sight of the airport, you must execute a missed approach appropriate for a circle-to-land (page 120).

It may sound obvious, but it's worth making crystal clear: You should only descend as far as you need to during the circling maneuver. The circling MDA might be 450 feet AGL, but if you can maneuver at 800 feet AGL with sufficient visibility below the clouds, hold that altitude until it's appropriate to descend farther.

That said, give yourself enough room below the

clouds to ensure you don't accidentally fly back into them.

Remain Within Protected Airspace

The appropriate circling MDA protects you from hitting any obstacles, but only within the protected circling area. That radius depends on the aircraft category you chose when selecting your minimums for the approach (page 73).

The protected area is quite generous when you consider most GA traffic patterns are flown within half a mile from the runway. Your normal traffic pattern should comfortably fit laterally. However, some circling MDAs are considerably higher than a traffic pattern. That tends to make pilots fly too wide a pattern, so it's helpful to have a moving map or distance to the airport on your GPS just as a reality check. Don't do more than glance at it because circling is an eyes-outside maneuver. It's also good practice to have any terrain warnings active and set for both visual and auditory warnings.

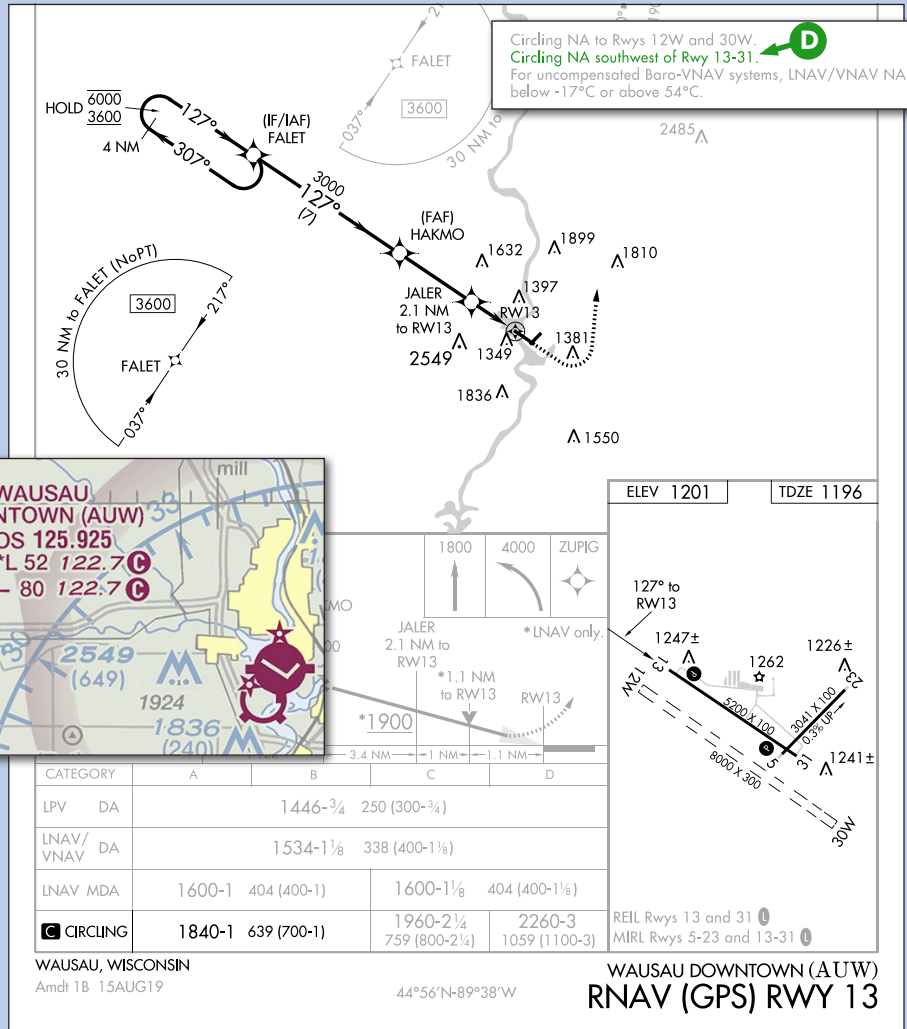
If conditions demand flying lower than a normal pattern and your personal minimums allow for this, be wary of flying too close to the runway. This is in many ways more hazardous as it leads to overshooting final at low altitude and with little chance of a VFR go-around.

CIRCLING PATTERN EXAMPLE: WAUSAU, WI (KAUW) RNAV (GPS) 13, CIRCLE TO RWY 31

You're arriving from the northwest with winds favoring Runway 31. There's an RNAV (GPS) Rwy 31 approach, but flying the RNAV (GPS) Rwy 13 circle-to-land Runway 31 could save a lot of time.

Runway 31 is left traffic, but the chart prohibits circling southwest of Runway 13-31 **D**. Some people interpret the chart prohibition as meeting the standard for "unless otherwise authorized or required" in 14 CFR 91.126(a), which would allow you to make turns in either direction. Unfortunately, the FAA has been officially mum on the subject.

If the airport is IFR and you have it to yourself, probably no one would notice or argue. However, the availability of an approach to Runway 31 could make that a hard sell to an FAA inspector if one happened to find out.



One way to visually estimate distance is to use the length of the runways as a measuring stick for your distance. A 6000-foot runway is about 1 NM.

Descend Below MDA and Land

The same 91.175 rules for descent below MDA apply to circling approaches. You must have the runway



environment in sight, have the required flight visibility, and be "continuously in a position from which a descent to a landing on the intended runway can be made at a normal rate of descent using normal maneuvers."

The last one is tricky on a circling approach. Once you descend below the circling MDA, you're no longer protected and it's not always obvious where that descent should start.

A rule of thumb is to remain at or above MDA until the point where that MDA crosses a normal

A common error with a circling approach is flying too close to the runway. If you're 500 AGL yet still far enough from the runway to turn base and final without an overshoot, the sight picture will be flatter than you're used to. Err on the side of a wide pattern if you're ever in doubt.

traffic pattern position and altitude. For example, if you're at 800 feet AGL you might begin descending when you turn base, as that's about the right altitude and position for a VFR traffic pattern. If you were 500 feet AGL on downwind for the circle, you wouldn't descend at all until turning final.

Some MDAs are higher than normal pattern altitudes. From an MDA of 1500 feet AGL, the descent will either begin earlier than normal, or be steeper than normal. Either way, there's surely a good reason for the high MDA, so beware of obstacles below.

If you can, err on the side of a longer final rather than a close-in, base-to-final turn. This will give you more time to correct your position if (despite your best efforts otherwise) you do overshoot final. It will

also give you a bit more time to get fully stabilized. The circling maneuver is complicated enough and demands full attention to your position and altitude. Don't add reconfiguration of the aircraft until you're lined up on final, or just land with your approach configuration as you would for a straight-in approach where you broke out right at minimums.

Missed approaches from a circle can be sketchy at best (page 120). But, if the conditions, the limitations of the circling approach, or just your gut feeling puts the outcome seriously in doubt, abandon the attempt. If that doubt strikes back when you're just considering the circle-to-land, see if there's another approach that's straight-in, or even change your destination to wait for better weather.

THE PROTECTED AREA IS BIGGER THAN YOU THINK

Faster aircraft require more space to maneuver, and thus need a larger protected area. This is why higher approach category aircraft have higher minimums (both for straight-in and circling).

Because it's true airspeed that matters, procedures developed after 2012 take altitude into account and expand the protected area for higher MDAs. The circling minimums line is marked with an inverse C: **CIRCLING**. Older approach charts only account for indicated

Circling MDA in feet MSL	Approach Category and Circling Radius (NM)		
	CAT A	CAT B	CAT C
E 1000 or less	1.3	1.7	2.7
1001-3000	1.3	1.8	2.8
3001-5000	1.3	1.8	2.9
5001-7000	1.3	1.9	3.0
7001-9000	1.4	2.0	3.2
9001 and above	1.4	2.1	3.3

airspeed and use the 1000-foot values on this table regardless of altitude **E**. These don't have the inverse C on the circling minimums line: **CIRCLING**. Now the FAA is removing the inverse C and going back to old notation as so many procedures are based on the larger, altitude-corrected standard.

Regardless of which protected area system the approach uses, the protected airspace is measured from edges and sides of every runway. You can find the standard picture in any IFR text, but more useful is to see it against a top-down picture of an aircraft on a typical downwind. It's bigger than most pilots realize, even for Category A. Also check if Category A and B have the same MDA. They often do, in which case you have the Category B distances for safety. You should still pay attention not to stray outside. If you want even more space and conditions allow you can fly the Cat C or D minimums.

