Non-Towered Airport Traffic Patterns

The How and Why of entering the Non-Towered Traffic Pattern

Article #2

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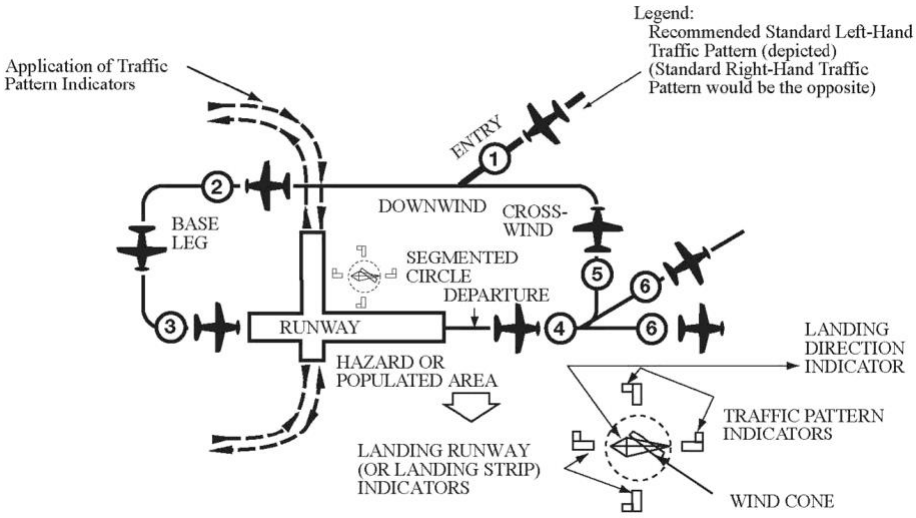
HOW

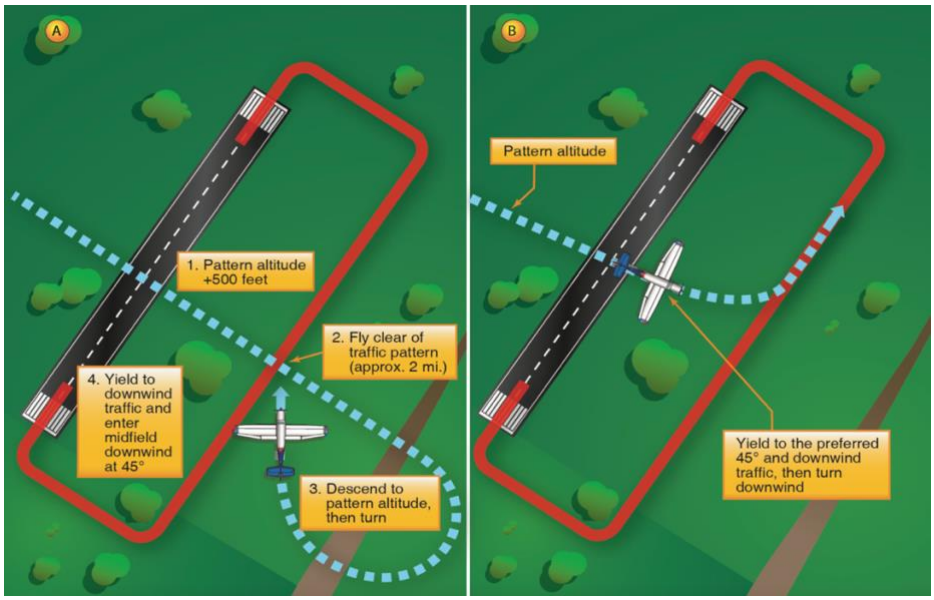
In the updated Advisory Circular 90-66B Non-Towered Airport Operations, the FAA states that they regulate how the non-towered airport traffic pattern is flown, but not how it is entered. Woo Who that means I can do what ever I want! Not so fast Orville. Advisory Circular 90-66B; the Pilot's Handbook of Aeronautical Knowledge (PHAK); the Airplane Flying Handbook (AFHB); and the Aeronautical Information Manual (AIM), all go on to describe three methods for entering the non-towered traffic pattern. There are two other entries briefly mentioned but not described in FAA publications. Below is the well-known depiction of the traffic pattern in many of the official FAA publications.



The notes accompanying this depiction all plainly say the primary entry to the non-towered traffic pattern is the 45 degree to downwind at mid-field and at pattern altitude. Additionally, the FAA guidance is to enter "well clear" of traffic already established in the traffic pattern. In my first article about non-towered operations, I referenced CFR 14-Part 91.126/127 and that

the first sentence directs that aircraft established in the traffic pattern have ROW over aircraft not in the traffic pattern. No mater which entry you choose, you must enter well clear and not make an aircraft in the pattern alter their flight path to accommodate your entry.

There are two alternate entries depicted in the FAA publications.



Alternate entry "A" on the left above is often referred to as the tear drop entry. Some pilots picture flying over downwind and making a 270-degree descending turn to enter downwind. That "teardrop" would be both dangerous and contrary to the descriptions. I refer you to note 2 above. You must fly out away from the traffic pattern (approx. 2 mi) before you descend and turn around to enter on a 45 degree.

Alternate entry "B" above right is the most controversial "allowed" entry procedure. It depicts flying over the airport at pattern altitude and turning directly into the downwind. Almost on a weekly basis I have pilots turn belly up to me while on downwind in the traffic pattern causing me to exit the pattern or drastically change my flight path. The "well clear/give way to traffic in the patten" guidance is repeated many times in the publications. This important guidance is also in the notes on the alternate entry depiction both on the left and right picture (note 4). One additional important FAA guideline for Alternate B is to only use this entry when the pattern "Is NOT BUSY". We'll talk about the "Why" in just a minute.

You may have noticed I made no mention of direct downwind, base, upwind, or crosswind entries. Those entries do not appear in any FAA publication. Recently, I listened to a national organization sponsored non-towered traffic pattern presentation where first it was stated that

there are no regulations on the traffic pattern, and they went on to describe some these entries. The regulation comment confused me. CFR 14 part 91.126, 127, 111, 113 have always "regulated" the non-towered pattern. In the first paragraph of AC 90-66B it states:

> *This AC is related to the right-of-way rules under Title 14 of the Code of Federal Regulations (14 CFR) part 1, § 1.1 (traffic pattern), and part 91, §§ 91.113 and 91.126.*

I have been a CFI since 1976 and cannot recall a time when these entries were in FAA guidance. All the non-regulatory guidance regarding non-towered airport operations did change in 2017 and has been updated in 2019. "Uncontrolled" has been removed from most FAA documents to remove the idea that non-towered airports have no rules. There are important reasons that none of these entries made it into the FAA's guidance.

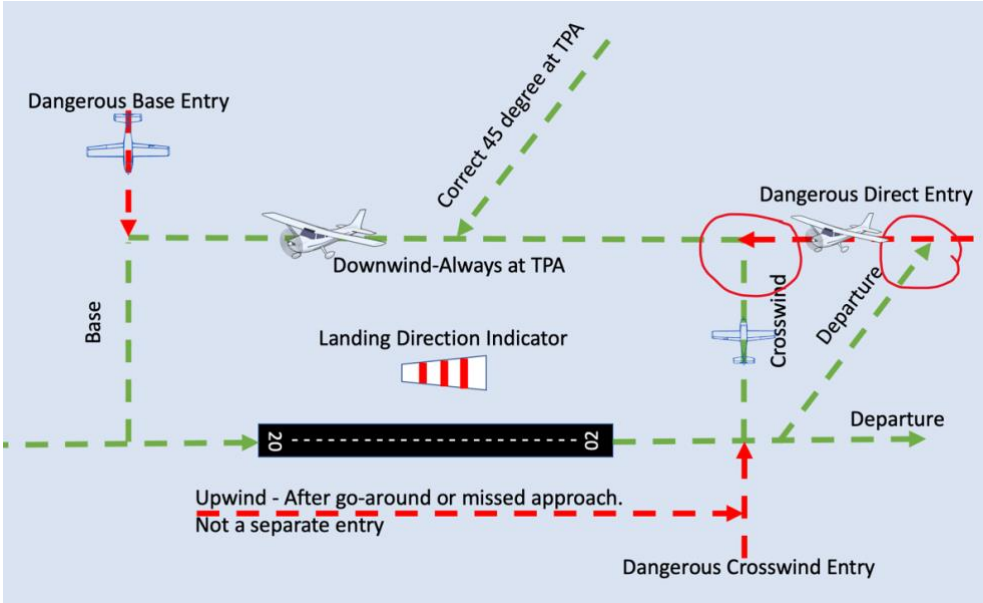
WHY

The reason the FAA has limited entries to the non-towered pattern is to make the entries more predictable. Non-regulatory publications have been written by hundreds if not thousands of experienced pilots over these past 80 years since the FAA inception. It speaks volumes that they "recommend" to us from experience. The procedures and recommendations contained in the publications listed previously are the gold standard of flying. If followed, the chances that you would be involved in an accident are reduced to very small percentages. If you are taking a check ride for a certificate or rating and not following the guidance in non-regulatory publications, you cannot expect to pass. Why would pilots claim they don't have to follow this guidance in every day flying?

The danger with the non-towered patterns, born out of accident data, stems from pilots making up entries, being unpredictable, flying wide and long patterns, and bringing towered airport entries to the non-towered operations. These actions cause an "uncontrolled" environment. Let me discuss why direct down wind, base, crosswind and upwind entries didn't make FAA guidance.

A direct entry to downwind is used by ATC when in contact with a tower but is problematic at non-towered airport. When a pilot calls downwind, the aircraft isn't where other pilots are looking for downwind traffic. It is also a problem for aircraft turning crosswind. The crosswind traffic is at Vy or Vx struggling to make pattern altitude and are required to turn crosswind at 300 feet below TPA (FAA Guidance). This means they have few options for adjusting their flight path to avoid the direct entry if they even spot them. The crosswind may hear the

downwind call but look towards mid-field and never see the direct entry approaching from the other direction. This poor practice also conflicts with the standard 45-degree departure.



Base and Crosswind entries have caused mid-air collisions. The last time I witnessed a base entry, the pilot called base but was 3 miles away from the airport. On downwind, I was looking forward and to my right in a right-hand pattern (opposite left traffic pictured above). Of course, they were not there, they were to my left. Looking at accident data, this scenario has led to mid-air collisions in 18 of the last 20 years. Again, these entries are a valid entry when instructed to do so by a control tower, but not in a non-towered airport traffic pattern where pilots need to be predictable and have an abort plan if a conflict exists.

Where Did Upwind Entry Come From?

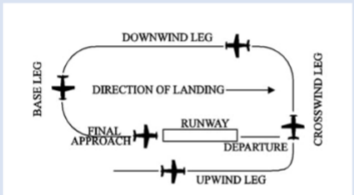
From Internet

Numerous Depictions Simply Showing an Upwind to show what the term "Upwind" means. Pilots erroneously believed this was a standalone Entry.

It has NEVER appeared in an FAA Publication as an Entry. When already established in the pattern, after go around or low approach, the pilot flies "Upwind" and turns crosswind well clear of departing traffic below.

From AIM, AFHB, & AC 90-66B

Aeronautical Information Manual (AIM) Section 3
Airport Operations
4.3.2 Airports with an Operating Control Tower
FIG 4-3-1
Components of a Traffic Pattern

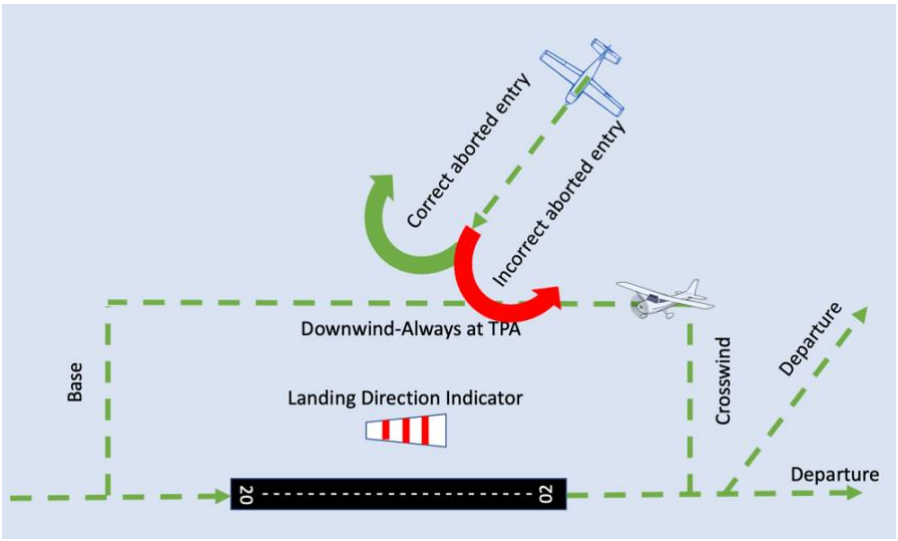


Note:
1. Upwind leg. A flight path parallel to the landing runway in the direction of landing.

Airplane Flying Handbook (AFHB) Chapter 7, Airport traffic patterns.
The upwind leg is a course flown parallel to the landing runway in the same direction as landing traffic. The upwind leg is flown at controlled airports and after go-arounds. When necessary, the upwind leg is the part of the traffic pattern in which the pilot will transition from the final approach to the climb altitude to initiate a go-around. When a safe altitude is attained, the pilot should commence a shallow bank turn to the upwind side of the airport. This allows better visibility of the runway for departing aircraft.

I have been a CFI since 1976 and flying for 50 years and I don't have any idea what a "upwind" entry is. I believe it has come about because of a misinterpretation of drawings. The upwind as a stand-alone "entry" to the non-towered traffic pattern is not included in the FAA guidance. As described by well known, experienced CFIs in online presentations, a pilot would fly up the runway on the non-pattern side and turn crosswind. This presents a specific mid-air collision potential in the crosswind area as well as being contrary to the chart supplement directing patterns on specific sides of the active runway, and in many cases conflicts with helicopter traffic trying to avoid the fixed wing traffic pattern.

The 45 degree entry is the primary entry. The reason is that flown at pattern altitude, it provides the entering pilot the best visibility of the traffic pattern, the best escape method if the pilot cannot enter "well clear", and finally, entering at mid-field keeps the entering pilot away from crosswind and 45 degree departing traffic. If on the 45 and you will interfere with an aircraft on downwind the pilot can turn away from the traffic pattern (turning toward the approach end of the runway if at mid-field). This keeps the entering pilot away from downwind and clears them from an aircraft entering on the 45 behind them. If the entering pilot turns toward the departure end of the active runway, they would be turning into downwind traffic opposite direction causing even more dangerous conflicts. This is also why 45 degree is recommended not 90 or 135 or any other angle of entry. The 45 gives the pilot turning room to escape. The correct turn to abort entry keeps you clear on the 45 but not on other angles.



I would like to turn to the fourth and fifth entries briefly addressed in the FAA publications, straight-in and overhead entries, as well as the controversial Option B entry.

Straight-in entries to the traffic pattern are anticipated by the guidance. I wrote an entire article earlier on this subject. Officially, the FAA directs that straight-in and practice instrument

approaches "do not enter the traffic pattern until performing a touch and go or low approach with the intent to enter the pattern". (AC90-66B) At that point they are now considered in the traffic pattern. For more on that subject please refer to my first article.

The overhead military style entry is briefly mentioned but not discussed in any FAA publication. This puts it in limbo-land, while mentioned it isn't an official entry. I have used this entry flying a PT-17, T-6, and of course in my time in the USAF flying fighters. It is completely confusing to most general aviation pilots, and I think it should be used in a limited way. Pilots flying this landing technique are obligated to explain what they are doing to the traffic pattern and must as always remain well clear of other pilots using the standard traffic pattern. It really needs to be limited to airshows and warbird fly-ins where most pilots know what is expected. Quickly described it is a landing pattern that begins with the plane or flight of planes flying a "Straight-in" but at pattern altitude. Once over the numbers of the landing runway at TPA the aircraft "Break" into a 360 degree descending turn to land on the active runway. My opinion, these entries need to be put in the same category as Option B entry where the FAA states it should only be used when the pattern is NOT BUSY.

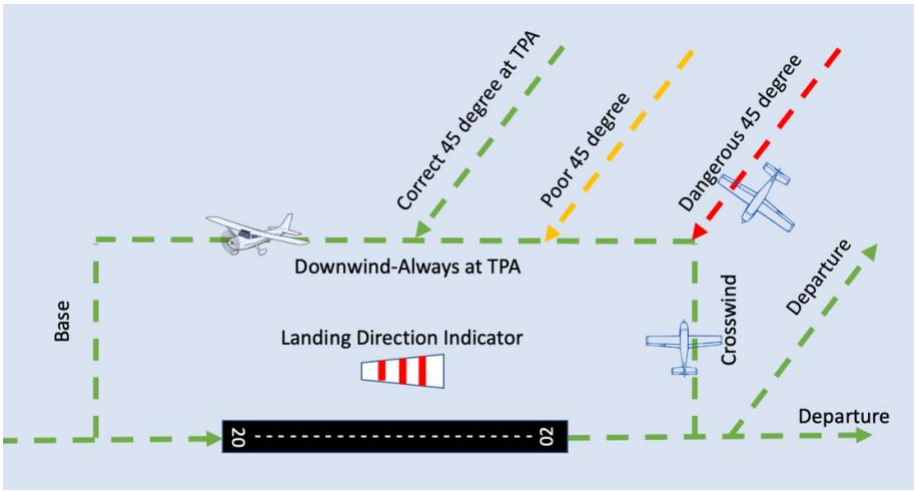
Finally, I want to go back to the Option B entry and discuss "why" this is an official entry when clearly it can lead to conflicts in the pattern. I cannot repeat this enough, it is anticipated with this entry that there isn't anyone on downwind and the pattern is not busy. Recently I flew the PT-17 from Bremerton (KPWT) all the way to Galesburg, IL (KGBG) for the 50th anniversary of the Stearman fly-in. As I flew across the min-west there were hundreds of airports that have at most two operations a day. At these remote and seldom used airports it is completely valid to fly over the airport and enter downwind directly. They are NOT BUSY. In Washington, towered airports are limiting operations for both IFR and VFR practice. This drives traffic to the non-towered airports with their own flight schools. In addition, many have the all-important restaurant attracting traffic. These airports are the definition of "busy". Consider that both the 45 degree and Option A entry have the option for an aborted entry. Option B does not, and it does not because it is anticipated that no other aircraft are in the pattern.

CFR14 91.111 directs a pilot not to fly so close to another as to pose a collision hazard. In numerous NTSB aviation court proceedings including FAA vs Fekete, the definition of too close (Not **well clear**) is considered making the other aircraft alter their course. In a FAA interpretation, the agency lawyers told a pilot that if the pilot flies so close to another aircraft where the other aircraft changes course and a conflict results, it was the fault of the first pilot for flying too close. When there is another aircraft on downwind and a pilot chooses to fly over

the field and turn in front of them, they are going "belly up" to another aircraft. They cannot see them and are in violation of the See and Avoid 91.113(b):

> ***General.*** *When weather conditions permit, regardless of whether an operation is conducted under instrument flight rules or visual flight rules, vigilance shall be maintained by each person operating an aircraft so as to see and avoid other aircraft. When a rule of this section gives another aircraft the right-of-way,* (Remember the downwind pilot is "IN" the pattern, the entering aircraft is not yet in the pattern) *the pilot shall give way to that aircraft and may not pass over, under, or ahead of it unless* ***well clear****.*

As I described previously, this happens a lot. I am absolutely dumfounded when questioned pilots say, "I had you in sight no problem". The point they should consider is not if they see the traffic; it is IF the traffic has them in sight. Turning belly up to another aircraft especially when you have no idea if they see you, is like Russian roulette. It is not if you will have a mid-air, it is whether it will be today.



To summarize:

- Use the 45 degree to mid-field entry
- Alternate entry A must be flown well clear before descending to TPA and returning on the 45 degree.
- Alternate entry B must only be used when the pattern is not busy
- All entries must give way to traffic in the pattern and terminate at mid-field on downwind well clear of traffic in the pattern.
- All 45 degree entries must be made at traffic pattern altitude. Descending entries are discouraged as very dangerous.

That's my ten cents (inflation), try to break the accident chain early with preventive measures. Over and out.