TRAFFIC PATTERNS

FULFILLS PA.III.B, CA.III.B, AI.VI.B

Objective	
The student shall understand how to enter and operate within an airport's traffic pattern. The student shall become familiar with the airplane's configuration and proper radio calls within the traffic pattern.	
Instructor Actions	**Student Actions**
- Discuss the components and configuration at different segments of the traffic pattern - Overview traffic pattern entry methods - Present methods for determining pattern direction and altitude - Highlight differences between traffic patterns at controlled and non-controlled airports	- Take notes and participate in instructor's discussion - Explain traffic pattern process to instructor - Perform the traffic pattern in-flight - Chair fly the traffic pattern at home
Case Studies	**Equipment**
- AOPA Accident Case Study – Traffic Pattern Tragedy - AOPA Accident Case Study – Communication Breakdown - Wake Turbulence Incidence Oshkosh 2019	- Computer - FAR/AIM - Model Airplane - PHAK - White Board
Completion Standards	
The student shall repeatedly perform traffic patterns within ACS standards and understand the risks associated with operating in the pattern. The stall shall become familiar with visualizing a stable approach and adjusting the pattern to facilitate different airports and conditions.	

ELEMENTS

RESOURCES

FAA-S-ACS-6C Private Pilot ACS - Area III Task B
FAA-S-ACS-7B Commercial Pilot ACS - Area III Task B
FAA-S-ACS-25 CFI ACS - Area VI Task B

FAA-H-8083-2 Risk Management Handbook
FAA-H-8083-3C Airplane Flying Handbook Chapter 8: Airport Traffic Pattern
FAA-H-8083-25C PHAK Chapter 14: Airport Operations

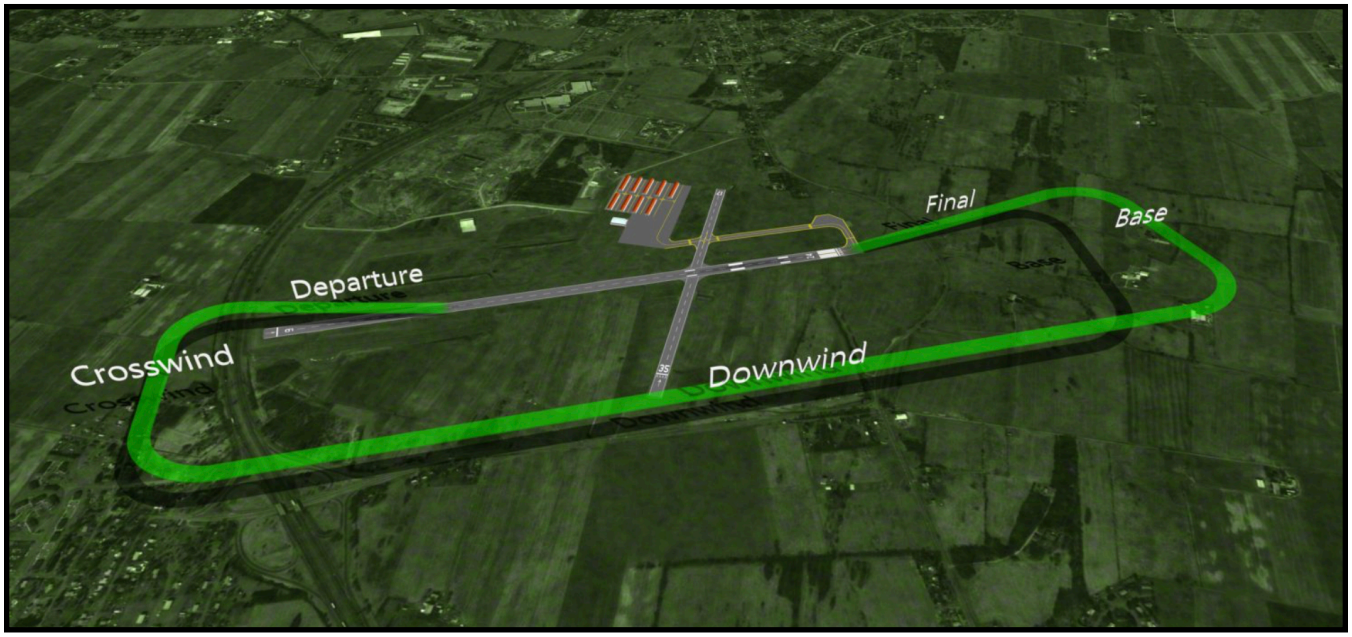
AIM 4-3 Airport Operations
AIM 7-4 Wake Turbulence

AC 90-23G Aircraft Wake Turbulence
AC 90-66C Non-Towered Airport Flight Operations

ERAU Traffic Pattern Video 1
ERAU Traffic Pattern Video 2

1. TRAFFIC PATTERN DEFINITIONS

Airplane traffic patterns refer to the standardized routes that aircraft follow when taking off, landing, and flying near airports. These patterns help ensure safety and predictability for other pilots and air traffic controllers. The traffic pattern is split into the following segments:



Departure The segment flown immediately after takeoff along the runways "extended centerline."

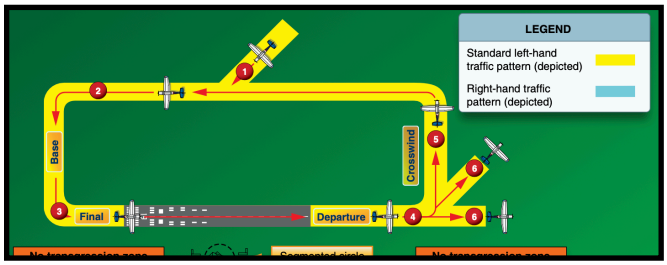
Crosswind Airplanes typically turn crosswind at about 700 feet AGL. This leg is perpendicular to the runway.

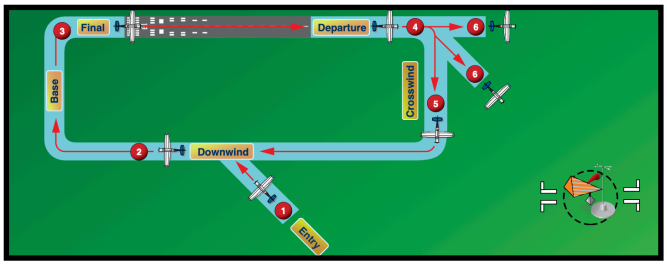
Downwind Airplanes typically turn downwind about 1 mile from the runway. The airplane flies parallel to but in the opposite direction of the runway.

Base The base leg allows the airplane to start heading toward "final approach" while in a descent.

Final The final segment of the traffic pattern, the airplane tracks a constant glidslope to a predetermined point on the runway, a "stabilized approach."

The figure above depicts a standard traffic pattern, where all turns are made to the left. At class G airports, left turns are mandated by 91.126(b)! Non standard patterns exist for many runways, and require turns to the right.





2. CONDITIONS AND CONFIGURATION

This section is a guide for operating in the traffic pattern. Often, changes to this procedure will be required. However, this should serve as a starting point for understanding the traffic pattern.

Departure – Climbing, turning crosswind at pattern altitude-300ft (AIM 4-3-3(e)).

Crosswind – Continuing the climb to pattern altitude, as specified in the chart supplement. Turn downwind 1 mile from runway.

Downwind – Upon reaching pattern altitude, 2150 RPM, 85 KIAS

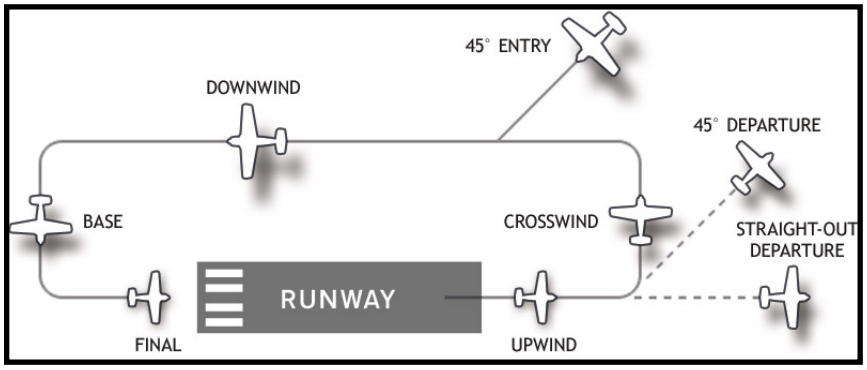
Abeam landing point or aircraft following – 1500 RPM, Flaps 21°, 70 KIAS

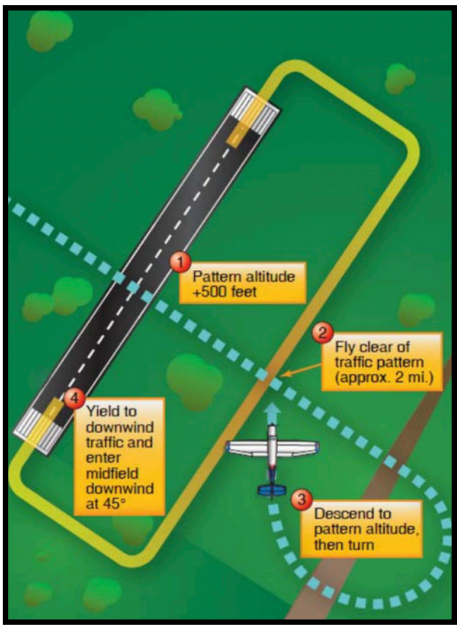
Base – 1500 RPM, flaps 34° if needed

Final – 1500 RPM, flaps 34° if needed. Cross fence no slower than 65 KIAS. Target 67 KIAS.

3. JOINING THE TRAFFIC PATTERN (NON-TOWERED AIRPORTS)

FAA discourages straight in approaches and the alternate downwind entry. Rather, pilots should perform the teardrop entry to the downwind. **Draw pattern entry**





4. PATTERN INFORMATION

Consult the chart supplement! Traffic pattern altitude, in MSL and AGL, and pattern direction are listed for each airport, as seen below. Some airports also paint traffic pattern indicators around a wind direction indicator, known as a segmented circle.

LANCASTER

GENERAL WM J FOX AIRFIELD (WJF)(KWJF) 4 NW UTC–8(–7DT) N34°44.46′ W118°13.12′ **LOS ANGELES**
H–4I, L–3E, 4G, 7B
IAP, AD

2351 B TPA—3151(800) NOTAM FILE WJF

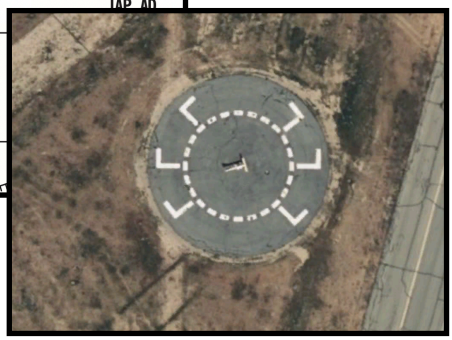
RWY 06–24: H7201X150 (ASPH–RFSC) S–50, D–68, 2S–86, 2D–117
MIRL

RWY 06: REIL. PAPI(P4L)—GA 3.0° TCH 40′.

RWY 24: REIL. PAPI(P4L)—GA 3.0° TCH 40′. Rgt tfc.

SERVICE: S4 **FUEL** 100LL, JET A **OX** 2

AIRPORT REMARKS: Attended continuously. Lgtd radio twrs 4 miles SE. Numerous birds SE of arpt. PAEW adjacent ramp area between fuel island and terminal bldg.



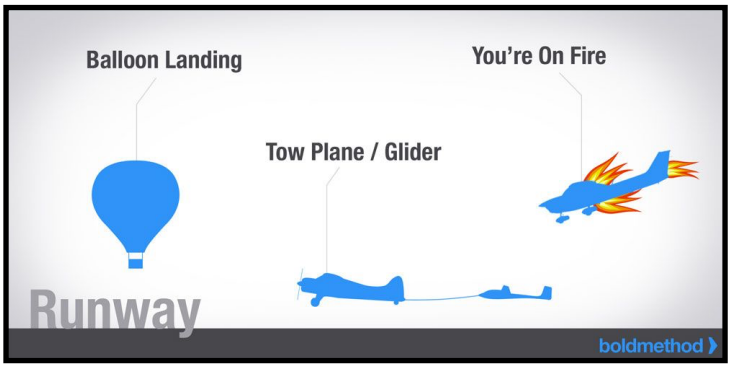
Controlled Airports: ATC manages aircraft traffic, issuing clearances and instructions for entering, flying within, and exiting the pattern. Expect possible 360° turns for spacing, extended downwind/ departure legs, or go arounds assigned by ATC.

Pilot-Controlled Airports: Pilots communicate with each other using a common traffic advisory frequency (CTAF) and follow standardized procedures for pattern entry and exit.

5. RIGHT-OF-WAY RULES

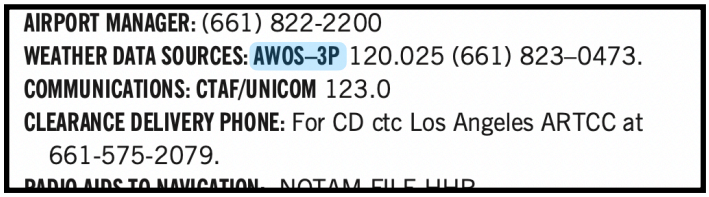
91.113 governs the right of way rules for aircraft. Paragraph g pertains specifically to landing, where

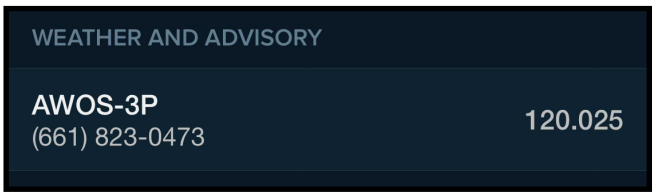
Aircraft, while on final approach to land or while landing, have the right-of-way over other aircraft in flight or operating on the surface, except that they shall not take advantage of this rule to force an aircraft off the runway surface which has already landed and is attempting to make way for an aircraft on final approach. When two or more aircraft are approaching an airport for the purpose of landing, the aircraft at the lower altitude has the right-of-way, but it shall not take advantage of this rule to cut in front of another which is on final approach to land or to overtake that aircraft.



6. AUTOMATED WEATHER SYSTEMS

Pilots should ensure they obtain current weather information before deciding on a landing runway. Descritions of weather reporting stations may be found in the Aviation Weather Handbook or Lesson Plan II.C. However, the type is listed in the chart supplement or in ForeFlight.





7. COMMON ERRORS

- Not accounting for wind drift
- Inadequate spacing
- Poor radio communications

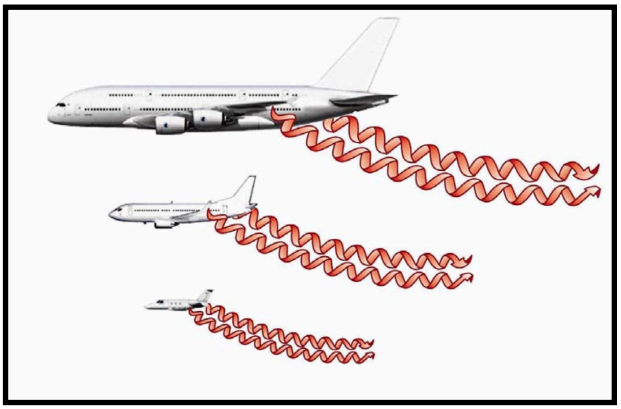
8. RISKS ASSOCIATED WITH THE TRAFFIC PATTERN

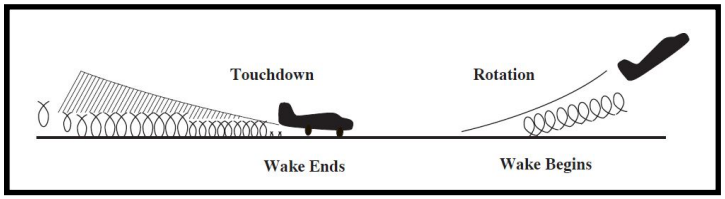
8.1. Wake Turbulence

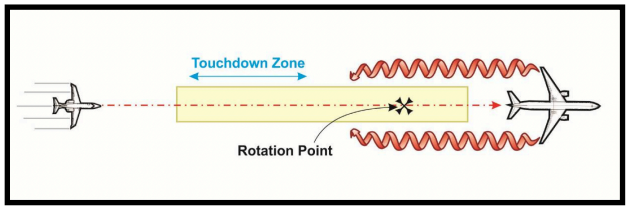
The airflow behind aircraft is rarely clean and laminar. In fact, it never is. The "wake" trail behind aircraft can pose devastating effects. The vortices are often highly rotational and can induce significant rolling forces on aircraft.

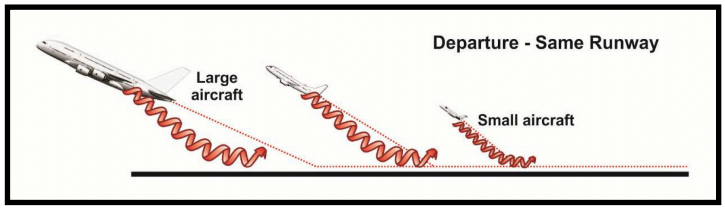
These effects are especially concerning at low altitudes where recovery can be impossible. When taking off behind a large aircraft, pilots should plan to rotate before the larger aircraft's rotation point. Conversely, during landing, smaller aircraft should remain above larger aircraft's glidepath.

There are dozens of excellent graphics in AIM 7-4 and AC 90-23G showing the wake trail behind varying aircraft and the wake/ground interaction during takeoffs and landings. Pilots should familiarize themselves with applicable procedures.









8.2. Collisions

Given the heightened amount of traffic in the vicinity of the airport, collisions most often occur in the traffic pattern, especially during clear days. Extra vigilance is required. Remember to see and avoid, exercise proper scanning, light up the plane, and make proper radio calls.

8.3. Low Airspeed Maneuvering

Remember that stall speed increases as a function of bank angle. However, there is nothing inherently wrong with bank angles at 30°, or even slightly higher, in the traffic pattern. Stall spin accidents are a result of uncoordinated flight, especially SKIDDING TURNS.

9. ADDITIONAL INFORMATION

AC 90-66C is a great resource to read about traffic pattern operations.

9.1. Cleared for the Option

Allows you to do any of these five things:

- Touch and go
- Stop and go
- Missed approach
- Full stop
- Go around