



AIRPORT TRAFFIC PATTERNS AND OPERATIONS

Just as roads and streets are needed in order to utilize automobiles, airports or airstrips are needed to utilize airplanes. Every flight begins and ends at an airport or other suitable landing field. For that reason, it is essential that the pilot learn the traffic rules, traffic procedures, and traffic pattern layouts that may be in use at various airports.

When an automobile is driven on congested city streets, it can be brought to a stop to give way to conflicting traffic; however, an airplane can only be slowed down. Consequently, specific traffic patterns and traffic control procedures have been established at designated airports. The traffic patterns provide specific routes for takeoffs, departures, arrivals, and landings. The exact nature of each airport traffic pattern is dependent on the runway in use, wind conditions, obstructions, and other factors.

Control towers and radar facilities provide a means of adjusting the flow of arriving and departing aircraft, and render assistance to pilots in busy terminal areas. Airport lighting and runway marking systems are used frequently to alert pilots to abnormal conditions and hazards, so arrivals and departures can be made safely.

Airports vary in complexity from small grass or sod strips to major terminals having many paved runways and taxiways. Regardless of the type of airport, the pilot must know and abide by the rules and general operating procedures applicable to the airport being used. These rules and procedures are based not only on logic or common sense, but also on courtesy, and their objective is to keep air traffic moving with maximum safety and efficiency. The use of any traffic pattern, service, or procedure does not alter the responsibility of pilots to see and avoid other aircraft.

STANDARD AIRPORT TRAFFIC PATTERNS

To assure that air traffic flows into and out of an airport in an orderly manner, an airport traffic pattern is established appropriate to the local conditions, including the direction and placement of the pattern, the altitude to be flown, and the procedures for entering and leaving the pattern. Unless the airport displays approved visual markings indicating that turns should be made to the

right, the pilot should make all turns in the pattern to the left.

When operating at an airport with an operating control tower, the pilot receives, by radio, a clearance to approach or depart, as well as pertinent information about the traffic pattern. If there is not a control tower, it is the pilot's responsibility to determine the direction of the traffic pattern, to comply with the appropriate traffic rules, and to display common courtesy toward other pilots operating in the area.

The pilot is not expected to have extensive knowledge of all traffic patterns at all airports, but if the pilot is familiar with the basic rectangular pattern, it will be easy to make proper approaches and departures from most airports, regardless of whether they have control towers. At airports with operating control towers, the tower operator may instruct pilots to enter the traffic pattern at any point or to make a straight-in approach without flying the usual rectangular pattern. Many other deviations are possible if the tower operator and the pilot work together in an effort to keep traffic moving smoothly. Jets or heavy airplanes will frequently be flying wider and/or higher patterns than lighter airplanes, and in many cases will make a straight-in approach for landing.

Compliance with the basic rectangular traffic pattern reduces the possibility of conflicts at airports without an operating control tower. It is imperative that the pilot form the habit of exercising constant vigilance in the vicinity of airports even though the air traffic appears to be light.

The standard rectangular traffic pattern is illustrated in figure 7-1 (on next page). The traffic pattern altitude is usually 1,000 feet above the elevation of the airport surface. The use of a common altitude at a given airport is the key factor in minimizing the risk of collisions at airports without operating control towers.

It is recommended that while operating in the traffic pattern at an airport without an operating control tower the pilot maintain an airspeed that conforms with the limits established by Title 14 of the Code of Federal Regulations (14 CFR) part 91 for such an airport: no more than 200 knots (230 miles per hour (m.p.h.)). In any case, the speed should be adjusted,

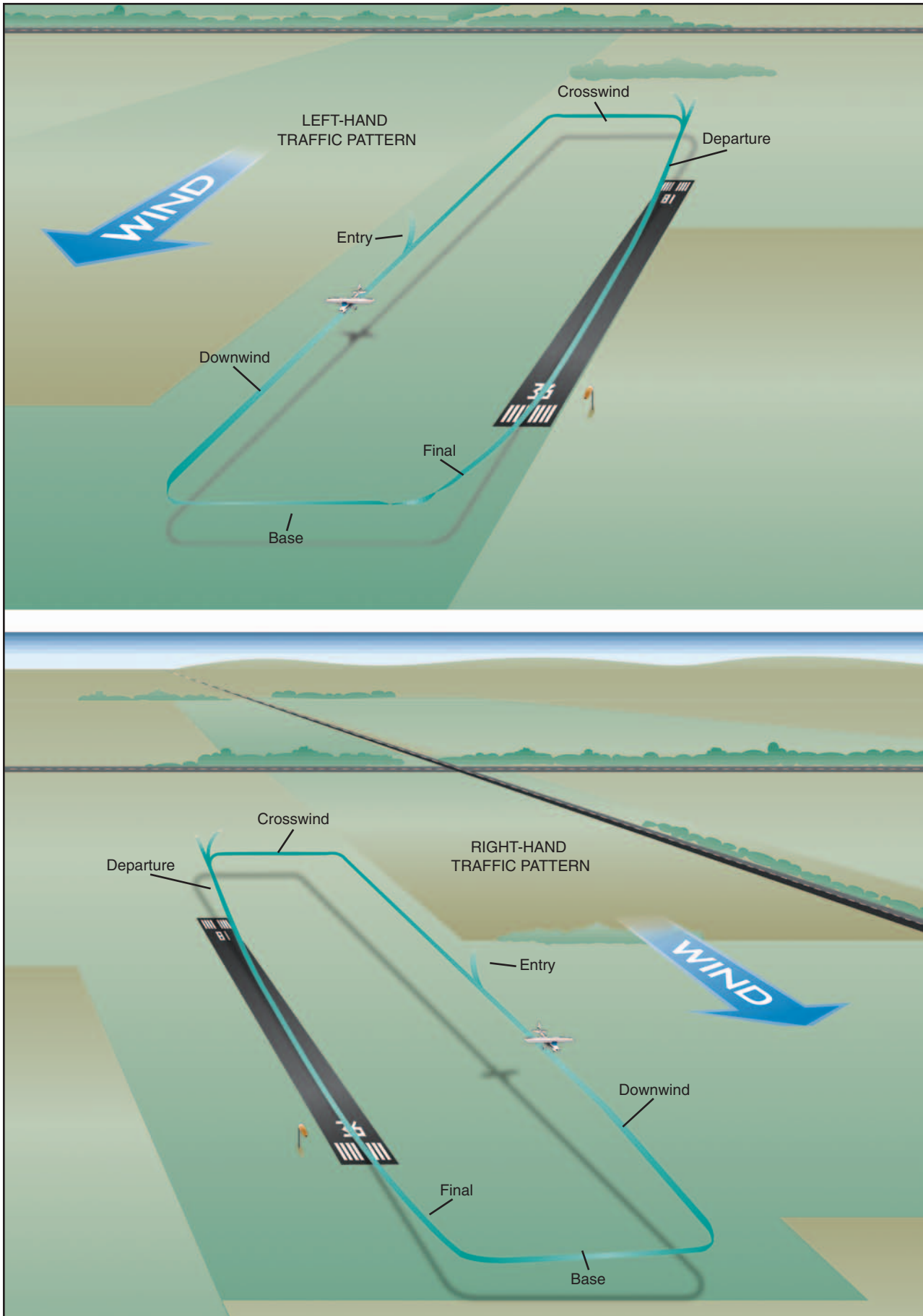
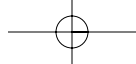
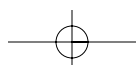
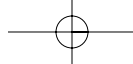


Figure 7-1. Traffic patterns.





when practicable, so that it is compatible with the speed of other airplanes in the pattern.

When entering the traffic pattern at an airport without an operating control tower, inbound pilots are expected to observe other aircraft already in the pattern and to conform to the traffic pattern in use. If other aircraft are not in the pattern, then traffic indicators on the ground and wind indicators must be checked to determine which runway and traffic pattern direction should be used. [Figure 7-2] Many airports have L-shaped traffic pattern indicators displayed with a segmented circle adjacent to the runway. The short member of the L shows the direction in which the traffic pattern turns should be made when using the runway parallel to the long member. These indicators should be checked while at a distance well away from any pattern that might be in use, or while at a safe height well above generally used pattern altitudes. When the proper traffic pattern direction has been determined, the pilot should then proceed to a point well clear of the pattern before descending to the pattern altitude.

When approaching an airport for landing, the traffic pattern should be entered at a 45° angle to the downwind leg, headed toward a point abeam of the midpoint of the runway to be used for landing. Arriving airplanes should be at the proper traffic pattern altitude before entering the pattern, and should stay clear of the traffic flow until established on the entry leg. Entries into traffic patterns while descending create specific collision hazards and should always be avoided.

The entry leg should be of sufficient length to provide a clear view of the entire traffic pattern, and to allow the pilot adequate time for planning the intended path in the pattern and the landing approach.

The downwind leg is a course flown parallel to the landing runway, but in a direction opposite to the intended landing direction. This leg should be

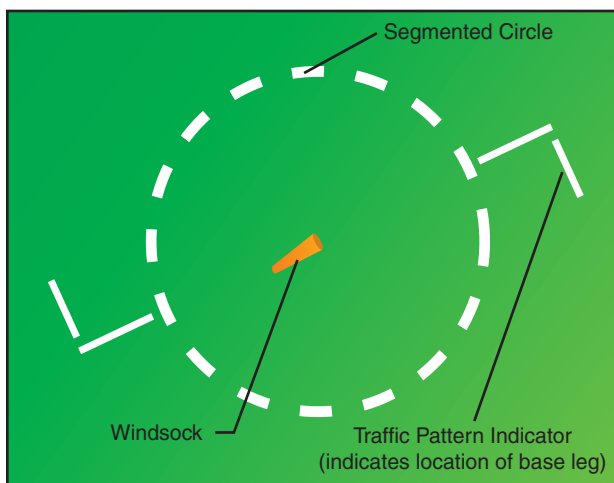


Figure 7-2. Traffic pattern indicators.

approximately 1/2 to 1 mile out from the landing runway, and at the specified traffic pattern altitude. During this leg, the before landing check should be completed and the landing gear extended if retractable. Pattern altitude should be maintained until abeam the approach end of the landing runway. At this point, power should be reduced and a descent begun. The downwind leg continues past a point abeam the approach end of the runway to a point approximately 45° from the approach end of the runway, and a medium bank turn is made onto the base leg.

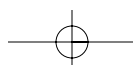
The base leg is the transitional part of the traffic pattern between the downwind leg and the final approach leg. Depending on the wind condition, it is established at a sufficient distance from the approach end of the landing runway to permit a gradual descent to the intended touchdown point. The ground track of the airplane while on the base leg should be perpendicular to the extended centerline of the landing runway, although the longitudinal axis of the airplane may not be aligned with the ground track when it is necessary to turn into the wind to counteract drift. While on the base leg, the pilot must ensure, before turning onto the final approach, that there is no danger of colliding with another aircraft that may be already on the final approach.

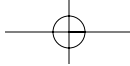
The final approach leg is a descending flightpath starting from the completion of the base-to-final turn and extending to the point of touchdown. This is probably the most important leg of the entire pattern, because here the pilot's judgment and procedures must be the sharpest to accurately control the airspeed and descent angle while approaching the intended touchdown point.

As stipulated in 14 CFR part 91, 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. 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. Pilots should not take advantage of this rule to cut in front of another aircraft that is on final approach to land, or to overtake that aircraft.

The upwind leg is a course flown parallel to the landing runway, but in the same direction to the intended landing direction. The upwind leg continues past a point abeam of the departure end of the runway to where a medium bank 90° turn is made onto the crosswind leg.

The upwind leg is also the transitional part of the traffic pattern when on the final approach and a go-around is initiated and climb attitude is established. When a





safe altitude is attained, the pilot should commence a shallow bank turn to the upwind side of the airport. This will allow better visibility of the runway for departing aircraft.

The departure leg of the rectangular pattern is a straight course aligned with, and leading from, the takeoff runway. This leg begins at the point the airplane leaves the ground and continues until the 90° turn onto the crosswind leg is started.

On the departure leg after takeoff, the pilot should continue climbing straight ahead, and, if remaining in the traffic pattern, commence a turn to the crosswind leg beyond the departure end of the runway within 300 feet of pattern altitude. If departing the traffic pattern, continue straight out or exit with a 45° turn (to the left when in a left-hand traffic pattern; to the right when in

a right-hand traffic pattern) beyond the departure end of the runway after reaching pattern altitude.

The crosswind leg is the part of the rectangular pattern that is horizontally perpendicular to the extended centerline of the takeoff runway and is entered by making approximately a 90° turn from the upwind leg. On the crosswind leg, the airplane proceeds to the downwind leg position.

Since in most cases the takeoff is made into the wind, the wind will now be approximately perpendicular to the airplane's flightpath. As a result, the airplane will have to be turned or headed slightly into the wind while on the crosswind leg to maintain a ground track that is perpendicular to the runway centerline extension.

Additional information on airport operations can be found in the *Aeronautical Information Manual* (AIM).

