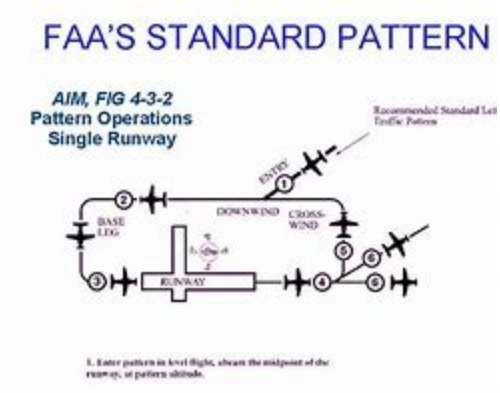

TRAFFIC PATTERNS AND AIRPORT OPERATIONS

One of the greatest tools in aviation learning is the traffic pattern at an airfield. Whether a fixed wing or rotary wing, the repetition of taxing, taking off, flying the pattern and landing are invaluable to the education process of learning to fly.

During this workshop we will look at a closed traffic pattern at Nellis AFB using the parallel runways for two traffic patterns. We will have a discussion on the pattern itself and how the Huey learning curve can be enhanced with some simple and easily managed techniques.

In this workshop we will cover:

The standard helicopter traffic pattern
Taking off from a hover and the ground
The management of power, altitude and airspeed
The final approach landing to a hover, the ground, and a running landing

The standard helicopter traffic pattern (AIM Section 3, Airport Operations)

It is recommended that aircraft enter the airport traffic pattern at one of the following altitudes listed below. These altitudes should be maintained unless another traffic pattern altitude is published in the Chart Supplement U.S. or unless otherwise required by the applicable distance from cloud criteria (14 CFR Section 91.155). (See FIG 4-3-2 and FIG 4-3-3):

1. Propeller-driven aircraft enter the traffic pattern at 1,000 feet above ground level (AGL).
2. Large and turbine-powered aircraft enter the traffic pattern at an altitude of not less than 1,500 feet AGL or 500 feet above the established pattern altitude.

3. Helicopters operating in the traffic pattern may fly a pattern similar to the fixed-wing aircraft pattern, but at a lower altitude (500 AGL) and closer to the runway. This pattern may be on the opposite side of the runway from fixed-wing traffic when airspeed requires or for practice power-off landings (autorotation) and if local policy permits. Landings not to the runway must avoid the flow of fixed wing traffic.

A pilot may vary the size of the traffic pattern depending on the aircraft's performance characteristics. Pilots of en route aircraft should be constantly alert for aircraft in traffic patterns and avoid these areas whenever possible.

Unless otherwise indicated, all turns in the traffic pattern must be made to the left, except for helicopters, as applicable.

Standard terminology to use by control towers and pilots (See FIG 4-3-1):

1. **Upwind leg.** A flight path parallel to the landing runway in the direction of landing.
2. **Crosswind leg.** A flight path at right angles to the landing runway off its takeoff end.
3. **Downwind leg.** A flight path parallel to the landing runway in the opposite direction of landing.
4. **Base leg.** A flight path at right angles to the landing runway off its approach end and extending from the downwind leg to the intersection of the extended runway centerline.
5. **Final approach.** A flight path in the direction of landing along the extended runway centerline from the base leg to the runway.
6. **Departure.** The flight path which begins after takeoff and continues straight ahead along the extended runway centerline. The departure climb continues until reaching a point at least 1/2 mile beyond the departure end of the runway and within 300 feet of the traffic pattern altitude.

Taking off from the ground and a hover

From the ground - Center the cyclic and slowly increase collective to lift the helicopter from the ground. As the skids leave the ground, allow the helicopter to move forward and slowly climb to a 3 ft altitude. The helicopter will accelerate to transitional lift, the nose will rise and you will have to add additional forward cyclic to compensate for the efficiency of the rotor. Let the helicopter accelerate to 70K and 500 FPM rate of climb.

From a Hover - Stabilize the helicopter at 3-5 ft. hover. Slowly move the cyclic to let the helicopter move forward and slowly accelerate to transnational lift. At that point the climb out will be exactly as a takeoff from the ground. This same technique is used from an out-of-ground effect hover.

Management of power and airspeed - The coordination of power and airspeed is very important when flying a helicopter. While flying the traffic pattern, remember to either slow it down or let it down, especially during a descent. If you try to slow it down and descend at the same time you will have trouble getting down to your altitude. Work on getting to your desired altitude before slowing down, or slow it down before descending. The airspeeds and altitudes in our exercise will help you understand the correlation between the two.

The final approach and landing to a hover, the ground, and a running landing

For training purposes, we start our final approach from 2300 ft. and 70kts. When you reach an approach angle of 7-8 degrees. Lower the collective to start a descent of no more than 500 fpm. (an ILS normally has a 3 degree angle) You will see your touchdown point on the windscreen. The touchdown point should stay on that point on the windscreen, If it moves down the windscreen, you are arcing and too steep. If it moves up the windscreen you are too shallow. Continue to slowly reduce your airspeed and power to maintain the proper angle of attack. Like an airplane, you can let the aircraft slip if there is a crosswind. As you approach the hover-in-ground effect, the helicopter will want to slow down due to the increased efficiency of the rotor system. You will have to reduce power to keep the aircraft moving and descending. At this point, the landing point will move under the helicopter as you end the approach.

Landing to a hover This is the normal way to terminate if you have to move off the landing pad to relocate or move for incoming landing traffic.

Landing to the ground This method is used when there is dust, blowing snow, or during a formation landing with multiple helicopters.

Running Landing Keep the airspeed just above transitional lift airspeed and slowly lower the collective to gently slide on the ground keeping the nose of the aircraft straight. This is used in the event of heavy blowing snow and in the event of a hydraulics failure.

The traffic pattern is a very important exercise in learning to fly a helicopter. You do everything needed to improve your skills. Try to discipline yourself in maintaining your airspeed and altitude and your flying skills will improve immensely.

We will discuss all of this on Saturday. See you then!

Tom **“Hotstart”**