Ground Reference Maneuvers

[Airplane Flying Handbook Chapter 6]

GROUND REFERENCE MANEUVERS: Ground reference maneuvers are practiced to get you used to flying the airplane while using references on the ground to guide your path. There is a pretty simple concept that will be introduced. The subject of ground speed will come up.

When you are flying along notice how fast you are going over the ground. Now do a 180. If you are moving over the ground faster, then you have a faster groundspeed than you had when you were in the opposite direction. Pretty simple isn't it?. If you are going slower than you were in the opposite direction then you have a slower ground speed. You will want to take notice of this because it will tell you where the wind is. When the wind is behind you, your ground speed will be faster. When the wind is in front of you, your ground speed is slower. Look outside the plane and the ground will tell you everything you need to know.

Following is a separate document on all the ground reference maneuvers with drawings on it.

Ground Reference Maneuvers.

Below I will just give you some simple tips. One other thing you want to remember is all ground reference maneuvers are to be performed 600 – 1000 feet above the ground (AGL)

Ground Track

GROUND TRACK: Ground track is the line that you fly over the ground. If you have no wind you will not need what is called a wind correction angle. To keep this concept very simple, you can think of paddling a boat across a lake. It you are looking across the lake and the water is flowing from right to left. If you want to get across, you will have to steer the boat slightly to the right in order to keep a straight line across the lake. You want to do the same thing with the airplane.

Here is how you keep it simple, when you are flying along, look straight ahead of you and pick a point. If you find yourself drifting to the left then the wind is coming from the right side of the airplane, so you will need to turn the plane to the right to compensate for the wind. All you have to do is turn to the right until your reference point stops moving and you will have established your wind correction angle. See, you can do everything outside the airplane.

S Turns On A Road

S TURNS ON AROAD: The first maneuver I do is s-turns on a road. All you are going to do is go back and fourth in semi- circles around. The main problem I find students have is they don't focus on the attitude of the plane. If you hold the attitude of the plane at level attitude, you will not change your altitude unless, as here in Arizona there are a lot of strong updrafts in the summer.

When you first start practicing these maneuvers try and focus on maintaining a nose level attitude and don't worry about the distance from the road. Once you get the hang of keeping the turns level, then focus on getting the entire maneuver right. You will also want to focus on using the wing to keep level flight attitude. Go back and fourth between the nose and the wing.

Once you get the hang of this remember that the only time you want the wings of the plane level, is when you cross the road. You only want the wings level just for a split second. Don't get to close to your road.

Turns Around A Point

TURNS AROUND APOINT: Turns around a point are just one continuous circle around that point. Once again you will want to focus on the nose level attitude. Once again use the wing to help you. Fly the airplane outside and things will be a lot easier for you.

At first you will find that you are close to your point on one side and then far away on the other side. This is normal and happens to everyone.

Rectangular Courses

RECTANGULARCOURSES: The last ground reference maneuver you will practice is the rectangular course. You will usually find a field in which to perform this maneuver but you could use four roads also. I find students tend to focus on the field or rectangle itself. Yes, you want to maintain the correct distance but you will find that if you look far out ahead of you, it will be easier to get your ground track straight.

What I tell students is, first you want to stay about a half mile from the field or Roads. When you are about to turn (lets say we are turning to the left) look far out and pick an imaginary line between you and some point as far out as you can look. Make sure your imaginary line is parallel with the field now start your turn and line up on that point which you found. When the point does not move you have found the proper wind correction angle.

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