

Dutch-Roll©

UNCOORDINATED FLIGHT---A NECESSARY SKILL

While the controversy continues over spin training, I feel that a much more practical and useful flight skill is being neglected. I write thus of the Dutch-roll. I suppose that just as much of our aviation language originated from naval terms, the origin of the Dutch-roll could have come from the peculiar sideways shift of the stern of an apple-bowed caravel (Dutchman) when running before a following sea. As the stern was lifted by the oncoming wave it would swing to one side, the hull would roll as the swell passed, and the stern would swing back onto the course-line as the breaker moved under the bow and the hull rolled upright.

In an aircraft, especially those with V-tails, it is a tendency for the tail to wander off the line-of-flight far enough to generate a straightening force, but overshooting the correction only to repeat the excursion on the other side. If accompanied with a pitch variant, the tail may oscillate in a circle. The Dutch-roll in ship and aircraft is an undesirable characteristic.

The basic Dutch-roll consists of rocking the wings with the ailerons smoothly through a series of 10, 20, or 30 degree banks while keeping the nose on a point or heading with the rudder. If done while the aircraft is climbing most of the rudder application will be more or less right rudder with an occasional tap of left rudder. This does not detract from the value of the exercise.

To the student pilot, to whom the coordinated use of rudder and aileron has become a sacred ritual, the contradictory control pressures required for the Dutch-roll ranks as sheer heresy. The control pressures required equate with patting the head while rubbing the stomach. The skill acquisition compares with that of roller skating. It is best not to intellectualize it. Just do it until all by itself it seems to fall into place. Remember when you learned to skate?

Just as the four basics are skills essential in normal flight situations, so is the Dutch-roll an essential additional skill for successful crosswind landings and use of the rudder. In the off chance that the reader may be unacquainted I will endeavor to describe the maneuver and suggest an instructional sequence.

The Dutch-roll can be flown level, climb, or descent. You select a point or heading and try to keep on that heading. Beginners seem to do the series of banks too quickly. This increases the yaw effect and makes necessary abrupt usage of the rudder. At a slower pace the rudder use can be better anticipated. If the nose swings the rudder is being misused. Start over. The nose should not move during the banks. Maintain a constant airspeed. The rudder must be applied or relaxed sometimes in anticipation and at other times in conjunction with the ailerons.

A suggested instructional or practice sequence would be to use the climb time from pattern altitude to cruise altitude. This time is often under utilized and the Dutch-roll serves to clear the flight route. The student can begin with a series of rhythmical 10 degree wing movements while the instructor applies rudder to maintain heading. It is vital that airspeed be maintained relatively constant so that rudder application and effect will also be constant. Then the roles can be

reversed between student and instructor. The third step would be the student performing both functions with the instructor monitoring. If, for any reason, banks and nose movements become erratic--start over. See, just as in roller skating. It seems to be best to initiate the first banking of the wings to the left followed quickly with a solid application of right rudder **before** the nose has a chance to swing.

The left turning-factors of the climb is a constant that requires right rudder. The banking causes yaw which is a variable depending on amount and quickness. When the bank begins toward the right the rudder pressure is gradually relaxed but **not** removed because of the left turning-factor and adverse yaw in climb. The banking movements must be continuously smooth and rhythmical, as in waltz time. All efforts to control heading must be done with rudder while the banks are maintained in rhythm. Rudder amounts and timing of release or application is done in anticipation of heading changes.

The student will experience extreme frustration with this exercise in the beginning. As the student becomes visually aware of the nose on the horizon and how rudder is a control he will improve. It is vital that expectations of proficiency be planned over at least five flights. If air sickness is a problem, approach the exercise in gradually extended time periods from twenty seconds to three minutes. The most common difficulties seem to be making the banks too quickly and of unequal angle, holding the yoke tightly, not making airspeed adjustments, not recognizing heading changes, belated rudder applications, and attempting to salvage a blown exercise. If the nose begins to wander, start over.

Even though we are in uncoordinated flight there is still a required coordination between foot and hand, rudder, aileron, and airspeed. Coordination, even in uncoordinated flight, is a basic skill required for slips and crosswind landings.

Now what do we get from this. We get a pilot who can enter final for a crosswind landing with one half of a Dutchroll and the visual coordination skills required to maintain runway alignment, the nose position and the airspeed. The pilot can do this with those Dutch-roll skills that enable him to anticipate rather than react. He is ahead of the plane, not behind. If, because of wind velocity and direction or control problems, the half Dutchroll cannot be held on final--GO-AROUND.