

USE OF THE RUDDER

By Wm. G. Briegleb

The writer realizes that many newcomers to motorless flight are avid readers of SOARING so it might be well to note a few points about the use of the rudder. As for the "ole timers", a little refresher course never hurt anyone.

After some 1500 hours of instructing other individuals in the art of gliding and soaring flight, one of the most glaring faults I have found in the embryo pilot, and even old time glider pilots, is poor coordination. I have made it a policy that regardless of who is being soloed or checked out, he must be capable of a reasonable degree of coordination. Very noticeable is this lack of coordination on the final turn of a pattern. This is when the pilot should be flying his best—200 feet above the ground is no time for a vicious skid, but this seems to be the rule rather than the exception.

By reasonable coordination I mean that if the glider is equipped with a ball-bank indicator, the student or "ole timer" should be able to keep the ball at least "1-2 caged." While riding with many "ole timers" I find that they apparently like to use the rudder for a foot rest, planting both feet so firmly that it takes a good deal of pressure and verbal persuasion to get them to move their lead "clod hoppers" even a few degrees. When the "ole timer" and/or student relaxes enough to move the rudder, his usual procedure is to lay on bottom or top rudder as the case may be and then wonder why the rate of sink has alarmingly increased.

1. The rudder pedals are not for resting the feet. They are moveable and should be used properly.

2. If you wish to enter a turn or recover from same, the rudder must be used properly with the stick to avoid skidding or slipping.

3. If you wish to soar with a good deal of efficiency, proper rudder coordination is a must.

4. Fanning of the rudder does nothing for one except increase drag and perhaps give one a so-called feel of the rudder. If you're going to "feel" the rudder that way, you might as well wait until you're on the ground and run your hand over the surface. That will at least remove some of the dust.

Let us now enter a turn together. I say to the student ("ole timer") "Rudder and sidewise movement of the stick are used together. As soon as the turn and bank are established, one should bring the stick to neutral and the pressure on the rudder pedal should be relaxed." At this stage of instruction all that the rudder is used for is to establish the proper amount of turn.

In teaching the use of the rudder, glider pilots should be shown and made to realize that too much rudder left in a turn will cause the nose to drop and the airspeed to increase. If continued, the glider will go into a violent tightening spiral dive. On the other hand, if the rudder is held in the turn, and the nose starts to drop, the student may begin pulling the stick back to the top and rear—result—the nicest setup you can imagine for a spin!! Crossed controls! A famous aviation author and authority once wrote that he believed most glider accidents were not the result of stalls or spins but as a result of a spiral dive caused by improper use of the rudder. Spiral

dive or spin—either done unintentionally can be very disconcerting and dangerous.

Many gliders are equipped with springs on the rudder pedals to help return the rudder to neutral or to just keep the pedals and control system tight. Sometimes these springs are a little too tight and when the student has established his turn and relaxes his pressure on the pedal, it sometimes returns to neutral resulting in a slight slip which may increase in intensity, especially if it (the rudder) tends to "air lock", and follow the path of the glider through the air.

After the student has learned to properly enter and recover from gentle turns, a series of 90°, 180° right and left turns are good practice. Figure 8s are next, and last but not least, a coordination exercise will show even some of the "ole timers" how little they know about it (coordination). For example "ole timer", (aha, you thought, "he hasn't done anything for me or shown me up yet") get your sailplane lined up on some point on the horizon, increase your speed 5 to 10 miles above your normal cruise speed, then rock the wings 15 to 20°, not 30°. Keep the nose on the point and don't let your airspeed vary more than 5 mph. Nine times out of ten, unless you've practiced this maneuver, the nose will begin to wander and the airspeed will vary well beyond the desired limit. Another good exercise is "fish-tailing" or moving the rudder in such a way that the nose swings from side to side (yaws) while the wings are kept level with opposite movement of the stick. Such a maneuver requires a good deal of practice on the part of the novice in order to keep the wings from wagging and the airspeed constant.

When the coordination exercises are learned, the student will find it quite easy to hold a good gentle turn and roll in or out of it with just the proper degree of control movement. Let me say at this time that the controls are not always used in a coordinated manner. Sometimes in a thermal the ship will actually tend to straighten out even though a slight bit of rudder is being held in the turn. In order not to lose the thermal entirely it is necessary at times for the pilot to keep a constant rate of turn by extensive use of the rudder even though more or less bank is not needed. Just as sometimes it is necessary and advisable to increase or decrease the bank when buffeted out of a well banked position by rough air. As a general rule, however, the rudder is used with the ailerons. A point that must be considered in indoctrinating power pilots into soaring flight is the comparatively larger degree of rudder movement necessary to turn the sailplane as compared with that in power craft. This is due in some degree to the larger span and generally larger ailerons. When an aileron is lowered, it creates a good deal more drag than the raised one. This drag causes quite a bit of adverse yaw (opposite turn) which must be overcome by the use of the rudder.