8 - USE OF THE TRIMMER

During early flights trainees will be struggling to coordinate the ailerons, rudder and elevator. They will learn the skill more quickly if they acquire the habit of trimming for each phase of the flight.

Flying in trim is a good habit to acquire, but if it has been neglected in training's early stages it won't be as immediately obvious to an instructor as mishandling the controls, nor as potentially fatal as failing to keep a good lookout. The instructor should from time to time make a positive check to ensure that the trainee is trimming and re-trimming when appropriate. Consider the advantages:

- easier control of speed
- more attention can be paid to other important activities, such as airmanship
- easier to maintain attitude whilst thermalling, resulting in more accurate circles
- greater safety when speed is a critical factor, such as when low, or in the circuit.

For those reasons, introduce trimming as soon as the trainee has successfully mastered the use of the elevator, and begun to appreciate the relationship between attitude and speed.

BRIEFING POINTS

Pre-flight

Describe how the trimming mechanism works, and how moving the trimmer backwards or forwards affects the glider.

If you have time when you are sat in the glider waiting to launch, the effects of the trimmer can be simulated. With the trim lever central, ask the trainee to hold the stick with the right hand, in a neutral position roughly equivalent to normal straight flight. Tell the trainee to keep the stick central, and to use his left hand to move the trim lever steadily forward.

For an **aerodynamic trimmer**:

- on the ground the elevator's weight usually moves the stick fully forward. Operating the trim lever makes no difference to this, so the forces needed to keep the stick central bear no relationship to those felt in the air. For a reasonably accurate simulation of trim loads, the instructor will have to centralise the stick and hold the non-flying load. Ask the trainee to put his right hand on the stick, and use his left hand to move the trim lever forwards. As he does so, apply an increasing forward pressure on the stick, or relax the back pressure, to simulate nose-heavy and out of trim. Then ask him to move the trimmer back to the central position. Progressively reduce the forward pressure (or increase the back pressure) until an 'in trim' effect is simulated. With practice a reasonably realistic effect can be achieved, saving expensive air time.

For a **spring trimmer**:

- the majority of GRP gliders have spring trimmers which work directly on the elevator circuit. The weight of the elevator is often small and has little effect on the stick position (the springs are strong), so the instructor may not need to touch it. When the trainee takes hold of the stick, and keeps it fixed in, say, the central position and then moves the trim lever, there is a very obvious change in the stick forces.

Whatever the type of trimmer, it's useful to show the trainee the kind of stick loads which would be experienced if the glider was **out of trim**, with the trimmer set too far back, or forward.

Explain that except for a wire launch [chapter 16] or during the initial stages of an aerotow [chapter 17], the glider should always be flown in trim for steady phases of flight i.e. continuous turning (thermalling), flying slowly in lift, or faster in sink, in the circuit or on the approach; anywhere where the speed will remain constant for more than a short time.

Introduce trimming immediately after Effects of Controls. From the start, expect the trainee to fly the glider in trim, and be able to adjust it himself.

[If the glider has a very effective aerodynamic trimmer and the stick is held fixed, moving the trim lever can pitch the aircraft - albeit it to no great degree - in the opposite direction to normal i.e. trim back, nose down rather than nose up. In this case the trim tab(s) acts as a very small and inefficient elevator].

Always prompt the trainee to maintain the attitude and assess the stick force, rather than use the position and movement of the stick.

- in straight flight, take control and trim the glider to fly hands off. Point out that the glider is stable, and when correctly trimmed will continue to maintain the same attitude and therefore the same speed. *Even though the stick is released,* (get the trainee to look back at you, then take your hands off the controls) *the glider flies itself*
- hand control back to the trainee and warn him that you are going to alter the trim. Move the trimmer forward. The trainee should **maintain the attitude** against the increasing stick load. Ask him in which direction he is having to apply pressure to the stick - forward or backwards? Now ask the trainee to use the trim lever to reduce the stick load to zero, and then to check whether he has trimmed correctly or not, by briefly releasing the stick. Be on your guard! Some gliders will pitch quite violently if the trim lever isn't reasonably close to the correct position. If necessary, ask the trainee to return to the initial attitude and re-trim
- repeat the exercise by moving the trimmer fully backwards while the trainee maintains the attitude. Get them to re-trim again
- ask the trainee to trim for various speeds, say 50kt and 60kt. Tell the trainee that from now on, when the glider is in steady flight, whether straight or turning, he should always fly the glider in trim. Make sure he does so. When your trainee can manage steady turns, it is important that he habitually re-trim to enjoy the advantages previously described.

DE-BRIEFING

The habit of flying in trim will help the trainee achieve accurate speed control with a minimum of concentration and effort.

During the post flight debrief check his understanding with a few searching questions as to the why, when and how of trimming. For example:

- *Tell me why it's important to fly in trim?*
- *When would you normally expect to trim or re-trim?*
- *After circling slowly in a thermal, which way would you move the trimmer when speeding up to fly through sink?*
- *How do you know when the glider is out of trim?*

The trainee's answers to the above questions will:

- enable you to check understanding of the subject, and tell you how much of the lesson has been taken in
- help the trainee sort out and put into context the various aspects of the trimming exercises.

ADVICE TO INSTRUCTORS

Trimming as an exercise is taught, fully or partially learnt, and then neglected as the trainee moves on to more complex exercises. However, life will be easier for both the trainee and instructor if the instructor checks from time to time that the glider is always being flown in trim. It will be very obvious to the instructor if the glider is handed over out of trim. Point this out and encourage the trainee to adopt a 'trimming routine'.

If the trainee is having difficulty with speed control, check whether the glider is being flown in trim or not. Repeat the trimming exercises if necessary.

COMMON DIFFICULTIES

Trainees may find trimming difficult if they alter the trim before adjusting the attitude. The correct order is:

(1) adjust the glider's attitude and allow the speed to stabilise

(2) trim

(3) check that the trim is set correctly

(4) re-trim if necessary.

