

I – SAILPLANE EXERCISES TAUGHT IN A TMG

INTRODUCTION

A touring motor glider (TMG) can be very useful in teaching exercises which would take much longer in a pure sailplane. However, there are some tips and hazards which may not be immediately apparent to an FI(S). So, the overriding principle is;

Do not teach anything you have not been taught to teach in a TMG.

GENERAL

CFI advice: Ensure the instructor has enough TMG experience and personal workload capacity before commencing instruction on a TMG. The upper air exercises are a good starting point. If you are a CFI who does not have experience using TMG to instruct gliding exercises, it is strongly recommended you consult your local Senior Regional Examiner to discuss a safe way forward for the instructor to progress.

The student should be taught to fly with his/her right hand on the stick, and left on the airbrake lever. Some TMGs can only access the wheel brake or some other vital control from one seat. The instructor should sit in that seat. As we are teaching gliding exercises, not how to fly a TMG, the instructor should operate any power related controls, and quietly monitor oil pressure, fuel quantity etc.

THEORY BRIEFING

The appropriate theory briefing for the exercise to be flown should be given, or if it already has been given a simple test of understanding will suffice. See the appropriate chapter of this manual for advice and content. Additionally, so that they understand what to expect, brief the student regarding 'powered' elements of the flight, particularly if they have not flown in TMG before.

AIR EXERCISE & 'BY GLIDER' BRIEFINGS

As with the theory briefing, see the appropriate chapter of this manual for advice and content and remind the student of any TMG related issues. Talk through TEM with the student as though the exercise were to be conducted in a pure sailplane. Unusually, when using a TMG, the instructor will have additional TEM to consider that need not bother the student. Below is a sample of TEM including some of the issues from the subsequent exercises for the student. It is absolutely not exhaustive!

TEM

Threats:

Collision

Mitigation:

Maintain thorough
Lookout / Use EC

Errors:

Running out of height
for appropriate circuit

Monitor height &
position

TMG EXERCISES

TMGs aren't suitable for all exercises, but can do most and are highly suitable, in fact to be preferred, for some exercises. Many of these fall into the group known as Upper Air exercises. TMG will also soar, albeit not as well as pure sailplanes. There are some issues relating to Approach & Landing, but Circuits, Navigation, Field Selection & Landing and Aerotow Failure training are the TMG's specialist subjects.

UPPER AIR EXERCISES

Effects of controls, turning, stalling, etc. The easiest way of doing this is to climb as high as possible (within reason), and teach just as you would in your usual training glider. Use the engine to set a 1½ - 2 kts descent at around 50-55kt, carb heat hot. This gives a more realistic attitude and helps to keep the engine warm and ice free. You may have to put an extra demonstration in to cover different attitudes when turning left and right if sitting next to your student.

SOARING

TMGs generally do not soar as well as conventional sailplanes, but they do soar! If shutting the engine down, follow the advice in the Flight Manual before stopping it. Feather the propeller if possible. Cooling will occur rapidly while shutdown, very rapidly if soaring in winter wave. It is as well to consider that the engine may not restart and keep within easy reach of an airfield. When restarting the engine, warm it gradually just as you would after initial start on the ground. It may be several minutes before it is warm enough to apply enough power to climb.

CIRCUITS

Teach as you would in a training glider but try to arrange the circuit so that the student does not have to look across the cockpit. That is, if he/she is in the left seat, a left circuit is easiest. That may not always be possible at some clubs. Again, use the engine to set up a 1½ - 2 kts descent.

APPROACH CONTROL

The TMG may have spoilers rather than airbrakes. These require a shallower approach angle and may have an unusual trim change when used. As always, it is best for

the student to experience this at height before coming to the approach. Close the throttle when starting to use the airbrakes/spoilers. Also, carb heat to cold in case of go around or touch and go.

LANDINGS

CFI advice. Landing a TMG is high risk until the student has mastered the art of the held off landing. Consider whether the initial touchdown is better taught in a pure sailplane before attempting it in a TMG.

TMGs are very susceptible to propeller strikes if an incorrect technique is used during landing. A simultaneous touch down of mainwheel(s) and tailwheel followed by the elevator moving fully up is essential. Typical errors are approaching too fast, or bouncing, then forcing the aircraft onto the ground tail high. The instructor should be ready to take control immediately incorrect technique is observed. Also, many TMG lack elevator mass balance and should the touchdown be a little firm, too delicate a grip on the stick may result in the stick escaping the handling pilot, moving smartly forward with the resulting elevator position hazarding the propeller.

NAVIGATION

CFI advice. There is little point in attempting airborne navigation training until the student has received an appropriate amount of ground training in heading measurement, chart reading, altimetry, airspace, etc. Before teaching navigation, the CFI should ensure the instructor is thoroughly conversant with cross country navigational techniques, possibly by flying a task with him/her. The BGA website contains useful information in 'BGA Navigation Training and Testing Guidance'.

The student is not concerned with operation of the TMG, just navigating as in a pure sailplane. Therefore, dead reckoning calculations as done in the PPL world are not needed. However, rough headings, and knowledge of wind direction, chart information, NOTAMS, weather, radio frequencies, turn point procedure, final glide, etc. is essential. A task of about 100 - 150 km with 3-4 legs should be planned, maybe around BGA turn points. Ideally a moving map GPS should be available, and the student should be taught how to program it. In the air, the instructor should fly initially while the student concentrates on navigating, gradually handing over the flying as competence is gained. The instructor should use the throttle to control the altitude, and the attitude to achieve a good cross-country speed for a glider. The track should include deviating to imaginary thermals and some circling. Students often do not use the compass enough and its use should be encouraged repeatedly. The GPS should 'fail' at some point so that the instructor can be certain the student has grasped the art of map reading and compass flying. Warning: infringement of controlled airspace on this exercise is unforgivable. If the student has already completed field landing training, a practice at that may be beneficial. Final glide training at the end of the flight may be carried out with emphasis on a large safety margin. Over 1000' is suggested.

The instructor should not attempt to assess the student (e.g. for Cross Country Endorsement) on the first attempt. Once considered proficient, he/ she should be allocated to a different instructor for assessment.

FIELD LANDING

CFI advice. Field landing training is an area where instructors can unintentionally erode safety margins quickly. There is also scope for breaking 'Rule 5' of the Air Navigation Order. The BGA website contains much information on field landing. In particular, 'Conduct of Field Landing Training' should be required reading. Safety issues should be paramount to the instructor. Hazards include carburettor icing, rising ground on the go around, other aircraft, engine failure etc. A CFI should be convinced that an instructor will have assessed the area beyond the selected field as suitable to recover from an engine failure.

Before flying this exercise, the student should have received a comprehensive ground brief on field selection and landing out procedure. He/she is unlikely to be familiar with the TMG, particularly if it is fitted with spoilers. Telling the student to fly the TMG like he flies his normal glider (Astir?), and adjusting the power to give a representative glide performance seems to work. Select several fields with the student but without flying down to them. This gives the instructor opportunity to discuss topics such as wind, size, surface, approach obstacles, slope, stock etc. The instructor should select a field and fly a circuit to it, pointing out normal circuit procedures as much as possible, including pre circuit checks. The student can then be allowed to select and fly to several fields.

AEROTOW ROPE BREAK

CFI advice: When dealing with low level rope breaks or tug failures stress should be placed on conducting the minimum possible amount of manoeuvring even if the best outcome is a controlled crash. Some clubs have limited options for landing ahead following a rope break. However, great care should be taken not to encourage a return to the airfield sooner than safe to do so. While doing so may be feasible well before circuit height is reached, it is fraught with various hazards. CFI supervision should ensure that this training exercise does not produce the sort of accident it is trying to avoid.

Assessing fields before the 'rope' breaks is essential. Manoeuvring should be limited to small angles from straight ahead initially, widening as height is gained. Approach speed awareness is important. At a certain point, recovery to the airfield and a downwind landing may be possible. This can be considered an advanced exercise.

TOUCH & GO

The instructor is **not** authorised to teach this, nor take-off. He/she should take control, allow the speed to decay below stalling speed, close spoilers/airbrakes, and (if required) change hands to open the throttle.

GO AROUND

Again, the instructor is **not** allowed to teach this. Close spoilers/airbrakes, apply full power and adjust the attitude to achieve climb speed.

Please**Do not teach anything you have not been taught to teach in a TMG!**

The instructor should also, before any flying exercise discuss Threat & Error Management, along the lines of the previous example. It is proposed to include a wider discussion of TEM in chapter 6.

**MANOEUVRE DEMONSTRATION**

Describe the exercises to be flown and how to fly them to best effect. Include advice such as when the student should or shouldn't be on the controls. Usually, we start off showing the full manoeuvre and then teach parts until the student is flying all of them. Include information on variations on the basic manoeuvres.

Draw attention to the Common Difficulties at the end of the chapter and any particular 'Gotcha's' if they exist. Include advice on how to deal with particular issues with the exercise in question. For example, Slip and Skid in the case of Turning.

As with the Air Exercise Briefings, depending on the volume and complexity of exercises, it is possible that multiple demonstrations will be required.

MANOEUVRE LESSON

The intention of the lesson is to teach the student how to conduct the exercise(s) briefed and demonstrated. To identify when the glider is manoeuvred as required, when it is not manoeuvred as required and how to correct that.

Whatever the exercise, it is best taught in bite size chunks. Start by teaching them the various parts, preferably in a logical order, then guide them through flying the complete exercise including taking all the appropriate decisions.

As always if the student does not manage to fly the exercise adequately, then identify what the problem is, re-demonstrate if required and let them try again.

DE-BRIEFING

Inevitably the content of any debriefing will be driven largely by how well/badly the flying exercises went. However, here the essential elements of the debriefing should be covered. The aspects of the exercises flown, how well they were conducted and any misunderstanding or difficulties that may have become apparent. Be constructive and in the students' logbook point out what should be included in their next flight and when appropriate make an entry in the student's training record, and a remember to end on a high. Multiple De-Briefings may be required if the flight contains multiple exercises.

COMMON DIFFICULTIES

The student may struggle initially with the unfamiliar aspects of the TMG. Noise & vibration, side by side seating and wearing a headset come as strange to a pure glider pilot and they will need a little time to adapt. If the TMG is equipped with spoilers a practice circuit and approach at the home airfield will be helpful.

Students sometimes seem very keen to undertake Navigation or Field Landing exercises in unsuitable weather or at unsuitable times of year (with regards to the state of crop). The temptation to 'keep them happy' but conducting the exercise anyway should be resisted.