THE GLIDER PILOT'S MANUAL

2ND EDITION

KEN STEWART

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ILLUSTRATIONS

INTRODUCTION

Gliding is one of the most challenging of aerial sports. It requires skill in handling the glider and judgement both associated with flying the glider safely and utilising the energy present in the atmosphere to keep the glider airborne.

Gone *are the days when gliders were frail machines, which were launched* to a height, only to float unceremoniously to earth again. The modern glider is a strong aircraft made of the latest composite materials, capable of speeds in excess of 150 miles per hour. Such aircraft are capable of flights lasting ten hours or more and covering distances of over 1000 miles without landing.

Learning to fly is a process which takes time. With each new aspect learned comes a sense of achievement. The learning process is aided by good instruction, both in the air and on the ground. As gliding is a recreational activity, most glider pilots are trained by part-time instructors who although competent, do not always have the time to impart all the necessary backup theory which should be available to their students. This manual is intended not only to supply some of this information but also to give you a broader picture of where your training is leading. It also includes the exercise plans of all of the main training exercises which you can expect to complete before flying solo.

After your first solo flights you will want to progress towards the principal objective of the sport; soaring. The soaring section in this manual is designed to carry on from your basic training. Therefore this manual will give you all the information required to safely progress, from the day when you first arrive at the gliding club, to a reasonable stage of soaring proficiency. It will give you a sound base from which to develop within the sport, without delving deeply into aerodynamics and meteorology, thus remaining readable to those readers who consider themselves "non-technically minded".

The air exercises given throughout this book are included to give you an idea of what you will practise as your training progresses. Some exercises may be varied slightly, at your instructor's discretion, to allow for such variables as the weather conditions on the day, and your individual requirements. The entry speeds quoted for some of the exercises will be suitable for most training gliders, but these speeds may have to be altered for some older types of glider. Some exercises may only be demonstrated, if your instructor deems your attempting the exercise unnecessary. The order of the subjects and exercises covered is set out in a way which is designed to lead you through the knowledge required to fly a glider. From necessity, this will vary from the order in which a few of the exercises are introduced in practice. This is due to the need to make the best of conditions and the limited time in the air often available in gliding.

Where it is not practical to outline the whole of an exercise, a brief description of what is involved is given instead of the exercise layout. All exercises should be practised under the guidance of an instructor.

In addition to the exercises included in this manual, some national gliding authorities may also incorporate other exercises designed to improve your understanding of various control aspects of the glider.

Lastly, no book can replace the demonstrations and advice of a good gliding instructor. Therefore this manual is not intended as a substitute for qualified instruction and practice time in the air, but simply as an aid to your training and subsequent gliding.

SECTION 1

BASIC FLYING TRAINING

CHAPTER 1

THE GLIDER

Gliders come in a variety of colours, shapes and sizes, and are made of several different materials. The modern glider is an aircraft made of the latest composite materials, usually glass fibre or carbon fibre, whereas older types tend to be made of wood and fabric or metal. Almost without exception, gliders have conventional controls, similar to those on powered aircraft. Despite designers' attempts over the years to extract every small performance advantage from their designs, gliders have kept one general planform or shape. Often the only obvious variation noticeable to the casual observer is in the design of the tail area, where sometimes the tailplane is set at the top of the fin and on others it is set much lower. On some gliders the tailplanes are designed to form a "V" shape, but this is less common.

MAIN EXTERNAL FEATURES

Fig 1.1 shows a single-seat glider with the main features illustrated.

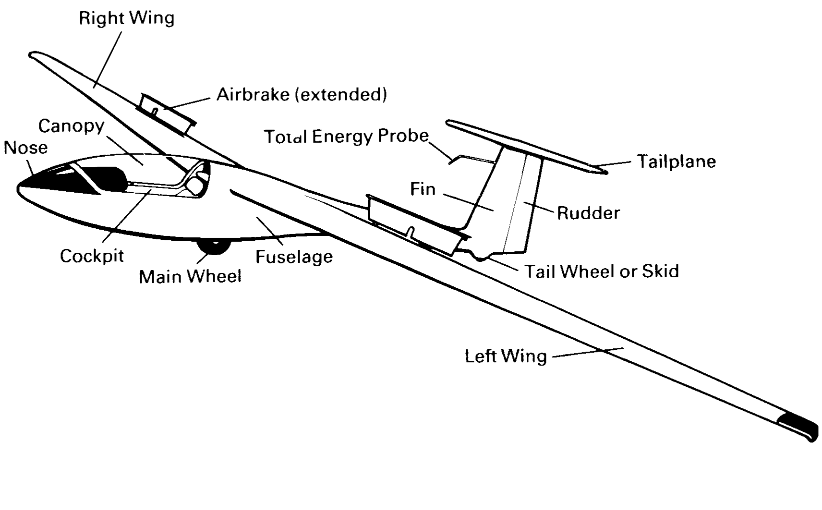

Fig 1.1 The glider. A typical single-seat glider.

The WINGS are often referred to as just the WING. On older types of glider the wing was of large area when looked at from above, and of thick profile when viewed from the front. However, in modern sailplanes the wing tends to be long in relation to its width in planform and much thinner than that of older gliders. The length of the wing from wing tip to wing tip is called the WINGSPAN, or simply the SPAN.

The FUSELAGE is the body of the glider. It provides accommodation for the pilot, houses the controls and instruments, and the necessary control rods and cables which activate the control surfaces on the glider's wings and at the tail.

The FIN is that part of the rear fuselage which is vertical.

The TAILPLANE is the horizontal surface at the rear of the glider. It is either fitted directly onto the fuselage or on the fin, sometimes just above the fuselage but more often at the top of the fin, as in the case of the glider shown in Fig 1.1. (For obvious reasons this is known as a "T" tail.)

In addition to the main structural parts of the glider mentioned above, there are several control surfaces.

The ELEVATOR is the horizontal control surface which is attached to the rear of the tailplane by hinges which allow it to move up and down.

The AILERONS are the control surfaces situated one at the rear of each wing. Like the elevator, they are attached by hinges to enable them to move up and down. However, they are linked so that when one goes up, the other goes down.

The RUDDER is a vertical control surface which is attached to the rear of the fin by hinges, which allow it movement to the left and to the right.

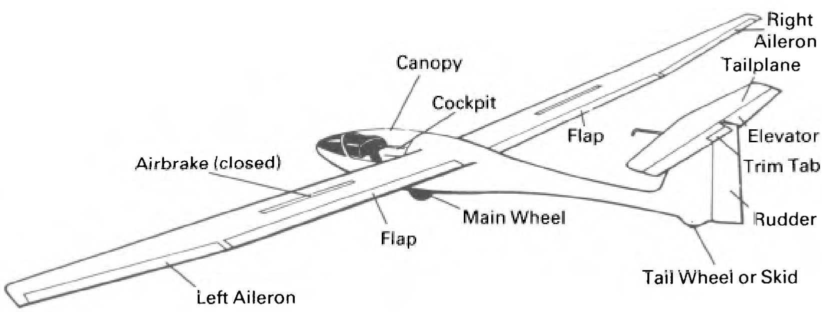

Fig 1.2 The main controls. The situation of the glider's control surfaces.

The AIRBRAKES are flat, oblong surfaces which can be made to project vertically from either the top, or both the top and bottom, of both wings. They are linked so that, when opened, the airbrake surface on both the left-hand and right-hand wings project from the surface at the same time and to the same extent. (Fig 1.3)

On some older gliders SPOILERS are fitted instead of airbrakes. Unlike airbrakes which extend vertically, spoilers are hinged surfaces which, when closed, lie flush with the upper surface of the wing. When operated they hinge upwards into the airflow. (Fig 1.4)

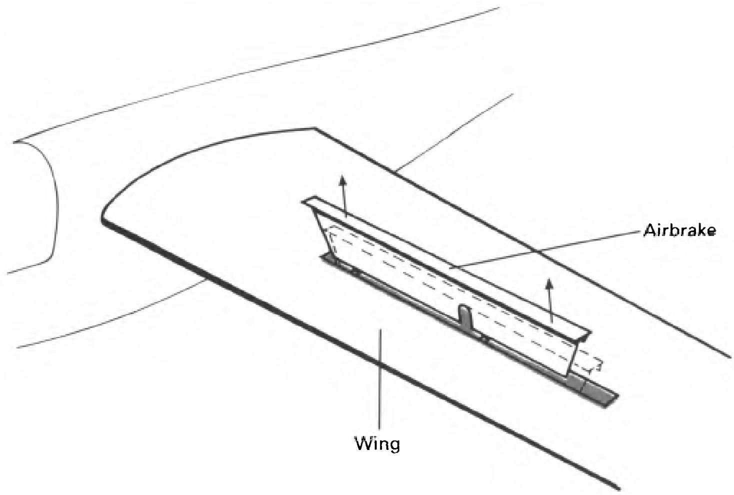

Fig 1.3 The airbrakes. Most airbrakes extend vertically from the wing.

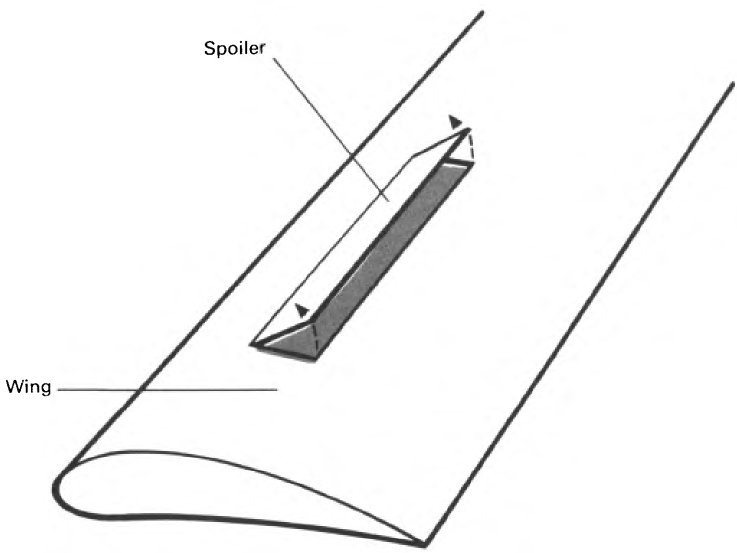

Fig 1.4 The spoilers. Spoilers hinge upwards from the top surface of the wing.

The TRIM TAB is a small surface fitted by hinges to the elevator, in much the same way as the elevator is to the tailplane. Occasionally there is a trim tab on both sides of the tailplane. It can be moved up or down. Trim tabs are not present on all gliders, as some manufacturers use other devices to do the same job.

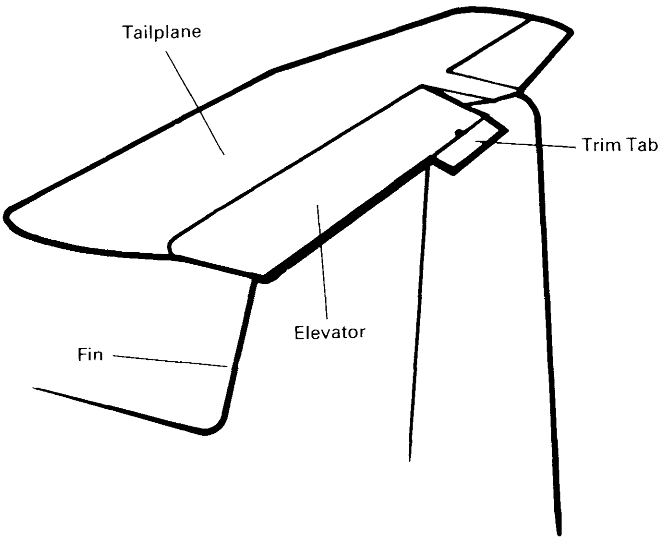

Fig 1.5 The trim tab. A trim tab is often fitted on the trailing edge of the elevator.

The COCKPIT is the pilot's accommodation. The cockpit determines whether the glider is a single or a two-seater. It is in the latter that all training will be done as it is equipped with, not only a second seat, but also a duplicate set of controls. These days it is covered by a perspex bubble called the CANOPY, although there are still many older types of glider to be seen which do not have this luxury.

Most gliders are fitted with only one MAIN WHEEL (referred to as the UNDERCARRIAGE). This is situated in the fuselage just aft of the cockpit. It may or may not be designed to be retracted into the fuselage in flight. Having only one main wheel means that gliders at rest will have one wing on the ground and will require an assistant to support the wing during the initial part of the take-off run. Other smaller wheels may be used on the front and rear fuselage to prevent damaging the fuselage structure. Skids may be used for this purpose on some types.

FLAPS are surfaces attached to the rear of each wing, between the ailerons and the fuselage. They are hinged so as to move up and down to the same amount and in the same direction on both wings. There are various types and they are mainly used on high performance sailplanes.

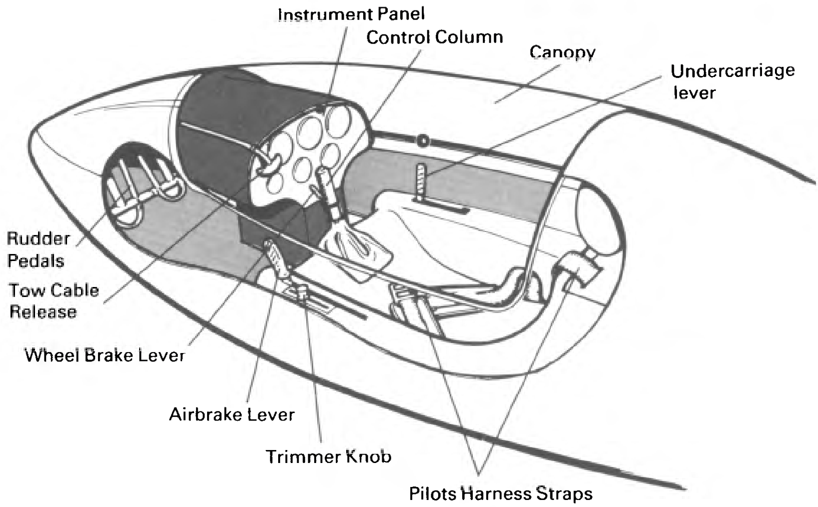

Fig 1.6 The cockpit layout. The cockpit of a modern glider showing the various controls.

THE COCKPIT

THE MAIN CONTROLS

The CONTROL COLUMN (often referred to as the STICK) is linked to the elevator and the ailerons. Forward or aft movement of the control column will move the elevator down or up respectively. Moving the control column to the left simultaneously causes the aileron on the left wing to move up and the aileron on the right wing to move down. Movement of the column to the right makes the right aileron move up and the left aileron move down. The control column controls the glider's speed and direction. Simply put, the glider will move in the same direction as the pilot moves the control column.

The RUDDER PEDALS are linked to the rudder. If the pilot moves the right rudder pedal forward the rudder moves to the right. At this stage it is important not to believe that the rudder changes the glider's direction. Unfortunately the "rudder" is badly named as it doesn't turn the glider on its own (unlike its counterpart on a boat), but only helps to make the turns smoother and more accurate. As mentioned above, it is the control column which controls the turning forces.

ANCILLARY CONTROLS

The TRIMMER KNOB or LEVER controls the position of the trim tab (or other trimming device).

The AIRBRAKE LEVER controls the airbrake surfaces allowing them to be extended or retracted as necessary.

The TOW CABLE RELEASE is a yellow knob or handle which is used to attach the TOW-ROPE or LAUNCH CABLE before flight and to release it in flight when desired. Sometimes a glider may have two separate release mechanisms; one near the nose for when the glider is being launched behind a light aeroplane, and another further back, for use if the glider is being launched by winch or tow car. If this is the case then this one control will operate both mechanisms.

If the glider is fitted with flaps there will be a FLAP LEVER (not shown) which allows the pilot to select the desired angle of flap for the phase of flight.

The UNDERCARRIAGE LEVER allows the pilot to raise or lower the undercarriage.

The WHEEL BRAKE LEVER is used to apply a brake on the main wheel as required. Some gliders incorporate this control in the airbrake system, either as a separate trigger type of lever or as an integral part of the airbrake system, whereby the wheel brake is applied if the airbrake lever is pulled to the limit of its range. On some other gliders a heel or toe pedal is used to apply the wheel brake.

THE INSTRUMENTS

There are only three instruments that need to be considered by an early student.

The AIRSPEED INDICATOR (ASI) tells the pilot how fast the glider is flying *through the air.*

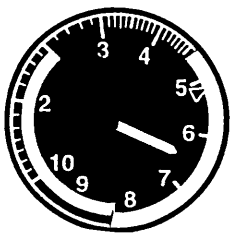

Fig 1.7 The airspeed indicator. The airspeed indicator indicates the glider's speed through the air.

It receives the information necessary to measure the glider's speed through the air from a sensing point called a PITOT TUBE which is usually situated in the nose of the glider. This information is compared to the readings of local atmospheric pressure taken at other points on the fuselage known as STATIC VENTS to give the reading shown on the airspeed indicator. These sensing points are also used by other instruments.

If there was no wind then the speed indicated on the instrument would be the same as the glider's speed over the ground (its GROUNDSPEED). However, as there is almost always some wind (that is, the air mass is moving) the airspeed indicator only indicates the speed of the glider through the air mass in which it is flying (that is, the glider's AIRSPEED) and not its speed over the ground. For instance in Fig 1.8(a) the glider is flying at an airspeed of 40 knots (40 nautical miles/hour) through a parcel of air which is stationary; that is, no wind. The glider is crossing the ground at 40 knots.

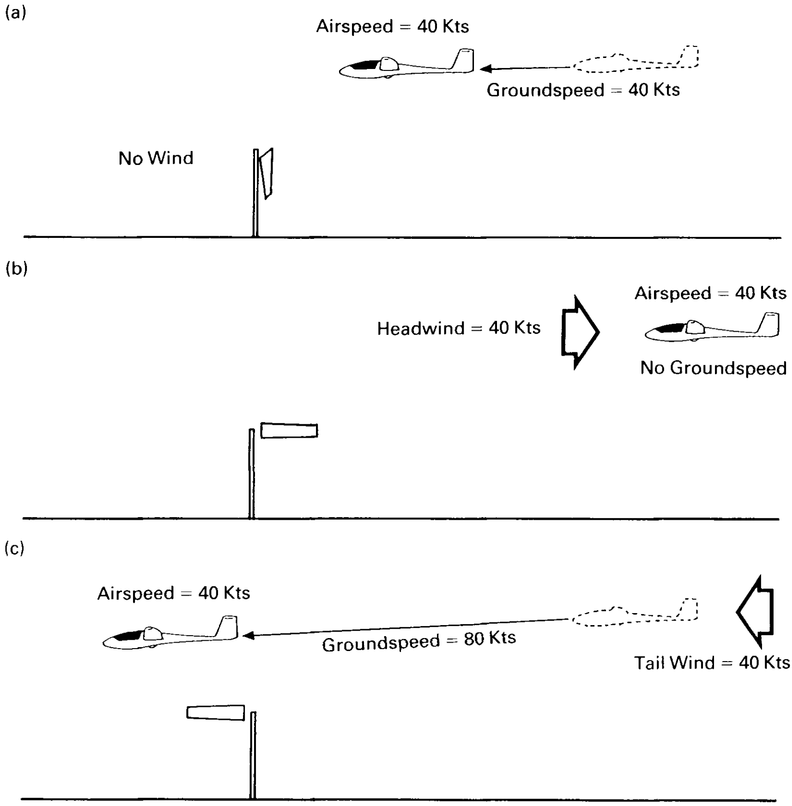

Fig 1.8 Airspeed versus groundspeed. The groundspeed will differ from the airspeed if there is any wind.

In Fig 1.8(b) the glider is flying at the same airspeed (40 knots) but now the parcel of air is moving in the opposite direction at 40 knots (that is, 40 knots of wind) and the glider is now stationary over the ground. If the glider were to turn and fly in the same direction as the wind, whilst maintaining an indicated airspeed of 40 knots, it would be crossing the ground below at 80 knots. (Fig 1.8(c))

The example given of a 40-knot wind is somewhat extreme and normally the wind strength will be much less. There will be occasions however, especially at higher altitudes, when the wind speed will reach or even be in excess of this sort of figure. The presence of such strong winds can be advantageous as you will discover later when different types of soaring are discussed.

At first this lack of ground reference may appear to make the airspeed indicator a fairly useless instrument , but the glider's control and handling depend upon the glider's speed relative to the air through which it is flying, making the airspeed indicator an essential instrument.

The VARIOMETER is a "rate of climb (or descent) indicator". It tells the pilot how fast the glider is rising or descending. The basic instrument will be affected by changes in airspeed and the airspeed at which the glider is flying. These effects can give misleading indications. It is possible and common to modify the instrument's output to eliminate some of these, thus giving the pilot a better idea of the vertical characteristics of the air through which the glider is flying.

Fig 1.9 The variometer. The variometer indicates the glider's rate of climb or descent.

The ALTIMETER shows the pilot how high the glider is flying relative to a preset datum, which, on local training flights, is usually the airfield height. The type normally used in gliders gives a three-needle presentation which is read like the hands of a clock. (Fig 1.10) Needle A indicates 100s of feet, while needle B indicates 1,000s of feet (that is, when the needle A passes 999 feet, needle B would be at the 1 on the dial, indicating 1,000 feet. Needle A would then continue to show 100s of feet between 1,000 and 2,000 feet). Needle C behaves the same for 10,000s of feet. There is also a small sub-scale within the main dial. This is used for setting the datum air pressure but can be ignored at this stage.

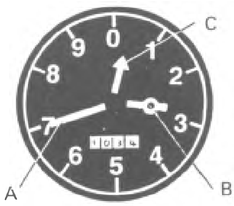

Fig 1.10 The altimeter. The altimeter indicates the glider's height.

Other instruments usually included are:

The TURN AND SLIP INDICATOR is an instrument used for cloud flying. It combines an electrically-driven RATE OF TURN INDICATOR, with a SLIP INDICATOR which is essentially a pendulum. The Slip Indicator is useful in that it helps the pilot judge if the glider's turns are balanced.

A COMPASS will normally be mounted on the instrument panel or canopy. Again this is used later on and as an early student you should not concern yourself with it until it is formally introduced.

The main points in this chapter will be mentioned as you are briefed for your first flight. At this stage however, a general idea of the glider's layout will help you appreciate the machine in which you are about to fly.

CHAPTER 2

THE GLIDING SITE

For someone beginning gliding, or even for power pilots visiting a gliding club, the gliding site can be a strange place.

For one thing, it can be unpredictable, both in terms of operation and size. For another, more often than not, there will be an absence of air traffic control and the strict control of aircraft and vehicle movements which exist at larger airfields. Despite this, gliding clubs operate successfully and safely, with the minimum of rules, thanks mainly to the self-discipline and airmanship of their pilots.

To attempt to discuss the average gliding site would be impossible, as gliding sites vary immensely in both size and operation. What we can do here is look at the general layout and situation of gliding sites, the launch methods used and give some safety guidance when on or flying near a gliding field.

The size and layout of a gliding site will depend, to a large extent, on the land available. Often the gliding field may be an active or disused airfield. The gliding operation may have the use of all of this area or only part of it, either because the remainder is unusable or is used by another operator such as a power-flying school. On such an airfield the gliders may take-off and land on concrete runways, operate from grass areas, or utilise both surfaces depending on availability and surface condition. Many clubs operate from "green field" sites which may be farmers' fields or areas of level heath land. (Obviously such sites will lack a runway in the usual sense of a long strip of concrete, but for convenience, the term RUNWAY will be generally used throughout the text to mean the line of the intended landing or take-off run. Similarly, mention of the AIRFIELD should be taken to mean the area of take-off or intended landing and not limited to a purpose-built aerodrome.)

The situation of gliding clubs will vary from sites in flat countryside to some on top of hills. Many of the older established gliding clubs were established on the top of a hill where gliders could be launched easily into the rising air currents which exist when the wind is deflected upwards as it encounters the hillside. As launch methods developed, being situated on top of a hill became less important and many gliding sites were formed near the bottom of ridges and hills. Once other forms of rising air other than "hill lift" were discovered, the requirement to have a hill as a neighbour diminished and gliding sites appeared in almost all landscapes.

LAUNCHING METHODS

The type of launching employed at a particular gliding site is determined to a great extent by the size of the airfield and its surface.

Long, hard-surfaced runways will make it possible to launch gliders by CAR LAUNCH. This technique uses a powerful car or pick-up truck to drag the glider down the runway on the end of a 1,500 feet long launch cable, until the glider reaches take-off and climb speed. The vehicle continues down the runway supplying the necessary power for the glider's climb until the glider reaches the top of the launch and releases its end of the cable.

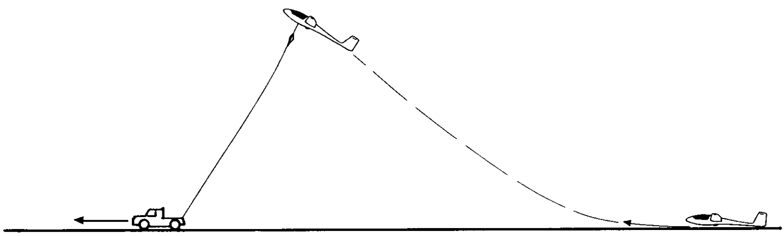

Fig 2.1 Car launching.

A variation on this technique, used when less runway length is available, or a greater height is required, involves looping the launch cable around a fixed pulley system. Using this system, known as a REVERSE PULLEY LAUNCH, the car drives back down the runway towards the glider during the launch.

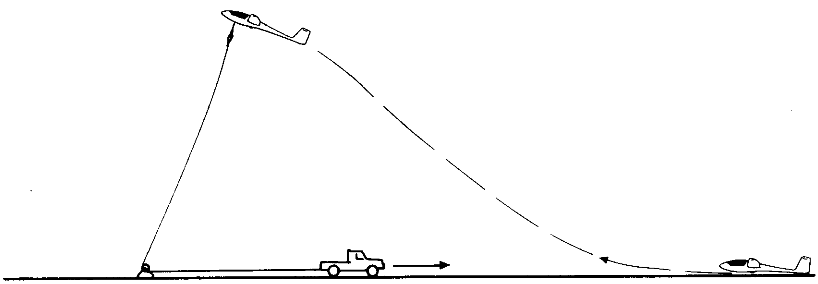

Fig 2.2 Reverse pulley launching.

By far the most common method of WIRE LAUNCH techniques is the WINCH LAUNCH. The winch launch does not require a smooth, hard surface capable of supporting a fast-moving launch vehicle. It employs a stationary winch positioned at the opposite end of the airfield to the glider. The winch is connected to the glider by a 3,000 feet long cable and provides the acceleration required for the launch, by winding in the cable as the launch commences.

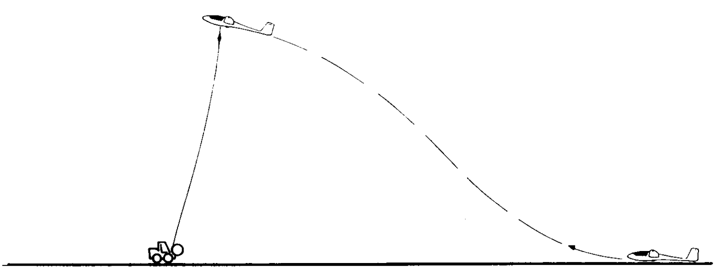

Fig 2.3 Winch launching.

Where the glider is towed into the air behind a light aircraft, this is known as AEROTOW LAUNCHING or AEROTOWING. This type of launching can be carried out from both hard and soft runway surfaces and is mostly limited by obstructions and runway length. It is a relatively more expensive method of launch, requiring considerable cost in obtaining and maintaining the towing aircraft. However, with the correct aircraft it is probably the most versatile of all launch methods.

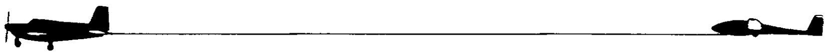

Fig 2.4 Aerotow launching.

At least one hilltop site still practises one of the oldest and most enjoyable methods of launch; that of BUNGEE (or CATAPULT) LAUNCHING. With this method a large elastic rope called a BUNGEE is used to catapult the glider into the strong wind which is being deflected upwards by the face of the hill. Bungee launching requires no fuel, only the assistance of six or more fit helpers. It may sound primitive, but no glider pilot can claim to have lived until this now rare, but delightful method of launch has been experienced.

Often, aerotowing and one of the wire launch methods will be used alongside each other on a particular airfield. It is not uncommon to find airfields which accommodate both gliding and power-flying activities. With a little organisation and co-operation the two disciplines can co-exist perfectly amicably and safely. At one airfield in the U.K., gliders share the airfield with both fixed-wing powered aircraft and helicopters, while at another the gliding club operation has to stop launching occasionally to allow an airliner to land or take-off!

SAFETY ON THE AIRFIELD

With gliders and tow-planes taking-off or landing, launch cables moving rapidly, spinning propellers, and numerous vehicles and machines operating on it, it is important that everyone on the airfield has a high regard for safety.

The following advice, together with any local rules and the application of some common sense should help you to enjoy your gliding safely.

- When on the airfield, keep a good lookout. Landing gliders may appear from any direction and a glider can not overshoot to avoid you. You will not hear them as they approach.
- Cross landing areas only when necessary, and do not loiter on them.
- Landing tow-planes usually trail a rope, which has metal fittings on its end. Never stand close to or under their approach path.
- Never cross the take-off run of a glider, even if it does not appear ready for launch. It is safer to go around the rear of the launch point.
- Never walk near or across wire launch cables, or an area where they may be. Cables are difficult to see and move very quickly once a launch begins or if they are being retrieved after a launch.

- Do not touch cables or their attachments unnecessarily.
- Never walk in front of, or stand near a glider which has a launch cable attached.
- Never approach an aircraft which has its propeller turning, unless the pilot has acknowledged your intention. In that case keep the wing between you and the propeller as you approach. Never touch a stationary propeller; moving it even slightly may cause the engine to start.
- Winch operators are protected by a cage against a flailing cable, should the launch cable break. Stay well away from winches during a launch unless you are inside this cage.
- Tow cars travel fast and the driver's concentration will be focused on the glider being launched. Stay well clear of their path at all times.
- If flying in the vicinity of the gliding site, avoid overflying the airfield as wire launching can occur up to 3,000 feet and launch cables are difficult to see.

Once you are familiar with gliding site operation, you will discover that these safety points come naturally. You will also find yourself assisting in the launching of gliders, driving winches, tow cars and tractors, and generally joining in the teamwork which helps make gliding such an enjoyable sport. Like all situations where powerful machinery is involved, safety consciousness is essential. If you are unsure about anything do not hesitate to ask. If you see someone doing something which you think is unsafe, challenge them. What they are doing may be perfectly safe, but if they were mistaken, they will be grateful.

GROUND HANDLING

The success of a gliding club depends greatly on the equipment being maintained in good condition. Apart from the need of the individuals on the airfield to look after their own safety, they in turn must take care of the equipment, especially the gliders.

Gliders may appear elegant and graceful when in the air, but on the ground they are heavy, bulky objects which require much ground handling in order to prepare them for launch. While the glider's structure is well-designed to withstand the aerodynamic loads imposed upon it in flight, and the potentially large loads during a landing, it is not so well-designed for any mishandling it may get on the ground. In order to safeguard it against ground handling damage, some understanding of how to handle the glider on the ground is essential.

While manoeuvring the glider around the airfield, whether it is being towed behind a vehicle or pushed by individuals, it is important to know on which parts of the structure force can be applied. This is especially the case with older gliders which are often constructed of wood and fabric.

Fig 2.5 shows the areas which are strong enough to support a push or lift force and those which are not.

In general the leading edge of the wing close to where the wing meets the fuselage is the best place to push. As many gliders have tailskids, the tail

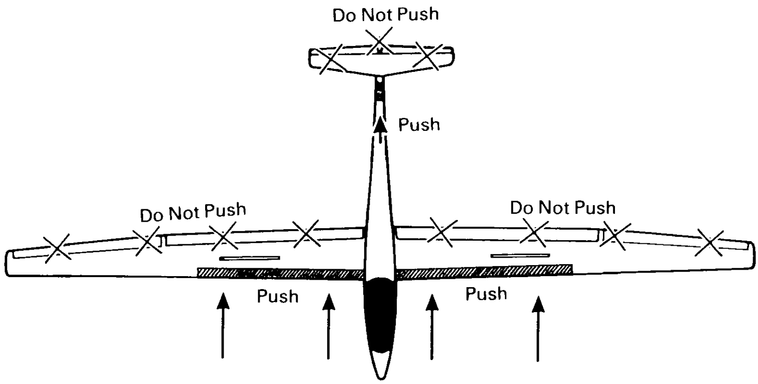

Fig 2.5 Ground handling points. Parts of the glider where it is safe to lift or push and those where it is not.

will have to be lifted if the glider is to be pushed backwards. To facilitate this, many gliders have special handles fitted to the rear fuselage. These strengthened points will also withstand pull or push forces. On gliders constructed of glass fibre, the fuselage immediately behind the wing will provide a suitable structure on which to push, if the glider is to be moved forwards.

The trailing edges of the wings, the control surfaces and the tailplane areas all tend to be of lighter construction and these areas are unsuitable for manhandling. Never lift the tail or push the glider by applying a force to the tailplane. Do not push or pull the glider by the wing tips as the large leverage created by the wings will result in considerable force being applied to the wing fittings at the point where the wing is attached to the fuselage. The strain placed on these fittings will be especially high if the ground is soft or rutted.

Whichever way the glider is moved, whether it be towed behind a vehicle or by manpower alone, the wing must be supported off the ground. This will require someone to lift and walk with the wing tip. This person is best placed to steer the glider, but should not exert forces which counter those of other helpers on the tail. Only one wing tip should be held to avoid strain being placed on the wing fittings should any confusion arise as to who is steering. In windy conditions this wing tip holder should be positioned on the windward wing tip to prevent the wind lifting the wing and potentially blowing the glider over.

When the glider is being towed behind a vehicle the tow-rope should be long enough to prevent any danger of the glider running into the back of the vehicle should an over-run occur. When towing the glider in this way there should be someone walking beside the nose of the glider to release the tow-rope in case of an over-run.

In windy conditions, more ground crew are necessary and great care must be exercised when towing the glider into wind. In such circumstances, it is advisable to have someone sit in the cockpit to reduce the chance of the glider accidentally becoming airborne and also to prevent the control surfaces banging against their stops when turning across the wind.

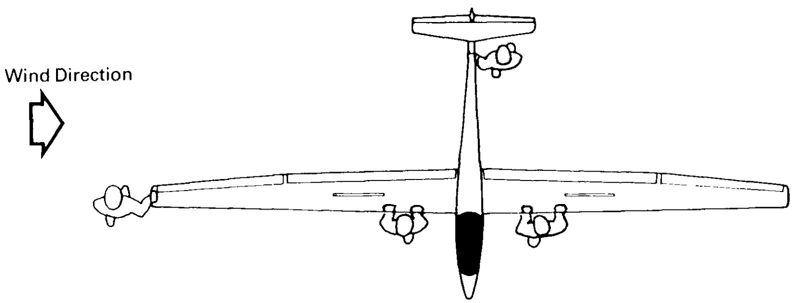

Fig 2.6 Ground handling. When moving a glider on the ground the wind must be taken into account.

The use of fixed bar towing attachments and wing tip fittings can reduce much of the effort and risks of ground manoeuvring. Such fittings must be well-designed and of good quality otherwise they themselves can cause damage to the glider.

PARKING THE GLIDER

When the glider is left unattended it should be secured so as not to be affected by the wind or the propeller wash from tow-planes or other aircraft. The canopy should be closed and locked. The glider's nose should be left pointing in such a way that the wind is not blowing from in front of the wing and such that the controls will not be caused to bang against their stops by the wind. The wing should be secured to prevent the wind lifting the wing and causing it or the other wing to hit the ground. It is common to prevent the lowered wing from rising by using old car tyres to weigh it down. However, with glass fibre gliders the wings are often supported level on trestles or tied to anchor points.

In very windy conditions, when the wind is striking the glider's tail, the glider will want to swing nose into wind. To prevent this, it will be necessary to place a tyre on the downwind side of the tail. A tyre may also be required to be jammed under the nose skid to stop the tail from rising.

One golden rule for safety is to "look after your glider and it will look after you".

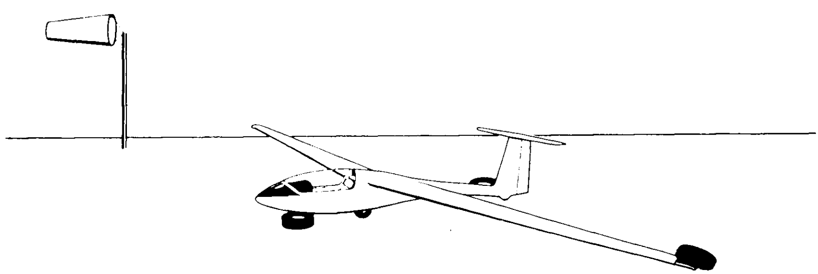

Fig 2.7 Parking the glider. The glider should be parked in such a way that the wind will not move it.

CHAPTER 3

YOUR FIRST FLIGHT

The main aim of your instructor on your first flight is to introduce you to the sport of gliding. In so doing, your instructor will show you around the glider, its cockpit and controls, and instruct you on the relevant safety aspects such as securing your harness. You will also be shown how to adjust your seating position with respect to your comfort, your access to the various controls and to your view from the cockpit.

If the glider has the seats arranged in tandem, you will be given the front seat. Not only will this give you a better view, it is also the seat which you will have throughout your training on this type of glider. The reason for this is that when the day comes when your instructor decides you should fly solo, it is from the front seat that you will fly the glider. Your first solo flights will therefore be from the seating position you are used to.

Once in the air, your instructor will allow you to settle down in this new environment, and point out local features and landmarks. The primary controls will be demonstrated and you will be allowed to try some gentle manoeuvres. This will enable you to see how easy and logical flying a glider really is.

If you are launched by aerotow your instructor will probably have adequate time to give you several demonstrations, and to allow you to attempt some basic manoeuvres for yourself. These will include trying out the effects of the controls and turning the glider. If on the other hand you are launched on your first flight by car launch or winch launch, you will probably not have as much time for demonstrations and attempts as on aerotow. In this case, your instructor will structure the exercises so that they can progress easily on subsequent flights.

At all times in flight, it is important that there is no confusion as to whether you or your instructor is actually controlling the glider. After your instructor has demonstrated a manoeuvre, he will give you control by saying, "You have control". Once you have placed your hands and feet on the controls, you should reply by saying, "I have control". Your instructor can then release the controls to allow you to attempt the manoeuvre. When your instructor wants to retake control, he will say, "I have control". You can now release the controls and confirm that you have done so by saying, "You have control".

During the flight (assuming that you are new to the world of flying light aircraft) your body will be subjected to some new sensations. Don't worry, these are not the sensations experienced by the jet fighter pilot. Indeed, they are not even of the magnitude of those experienced at the fair ground. (This is one author you won't get on a big dipper!) They are worth mentioning only because they may be unexpected. If the glider is launched by winch (or to a lesser extent, by car) the initial acceleration will be quite rapid. This will have the effect of pushing you more firmly into your seat, similar to accelerating from a stationary position in a powerful car.

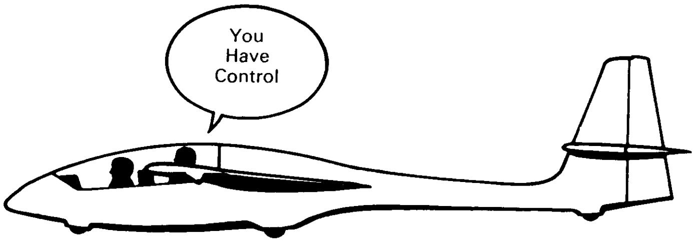

Fig 3.1 Who has control? Knowing who has control is essential.

Once in the air the sensations experienced are mainly due to the buoyancy of the air. If the day is windy or there are rising air currents then you will feel the glider being pushed up and down, or even feel as if a wing is occasionally being lifted. On a still, calm evening, the air will probably feel smooth and less of these sensations will be felt. Similar sensations can also be induced by control movements which are too rapid, especially if the control column is moved forwards too quickly.

Your instructor will explain such sensations at first, but as your time in the air increases, you will quickly get used to them and eventually be able to use them to assess the glider's position relative to rising air. Other sensations will become apparent which will help you decide whether or not you are controlling the glider accurately in turns.

All of these sensations will be covered further in later sections as they become more relevant. For now, it is sufficient to say that on most occasions, when the glider is being flown correctly, even a pilot with a few launches in his log book will not experience any unpleasant sensations.

Apart from getting comfortable in this new environment, one of the most important aspects to prepare you for your basic instruction, is to become accustomed to the view from the cockpit, and in particular, the position of the nose of the glider relative to the horizon. This view, known as the glider's ATTITUDE, is of primary importance when it comes to controlling the glider. It is used to tell you if the glider is likely to be maintaining a steady and reasonable airspeed, and whether or not the wings are level.

LOOKOUT

It is also of utmost importance, at this early stage, that you learn a lookout technique; your glider will not be the only aircraft in the air. The airspace in which you will be flying will also be used by private and commercial aeroplanes and helicopters, military traffic and other sporting activists such as microlight aircraft, hang-gliders, parachutists and of course, other gliders. It is essential that most of your attention is "outside" of the cockpit and to this aim, you will be taught to regularly scan around your field of vision, with particular emphasis when carrying out any manoeuvres such as turns.

Your first flight will probably last for fifteen to twenty minutes if you have an aerotow launch to 2000 feet. This is ample time for you to experience what gliding is like. If launched by winch or car launch, the time spent in

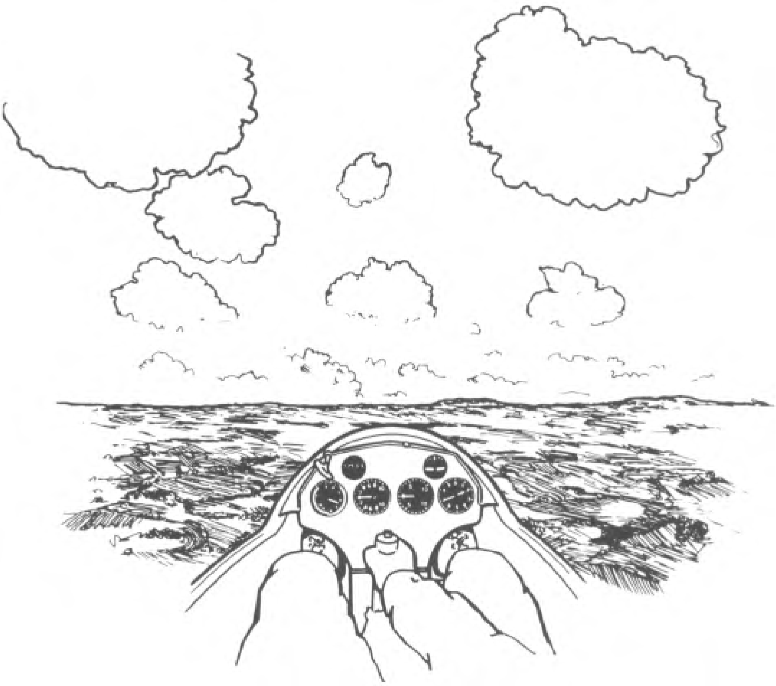

Fig 3.2 Flying by attitude. The glider's attitude (the view which the pilot has over the nose of the glider) is the main reference when gliding.

the air will be more like five minutes but there will probably be the opportunity to have a second or even a third flight on the same day.

There are very few formalities involved in preparing for your first glider flight, but in order that you know what will be required, they are outlined below.

Before flying at a gliding club, it is necessary for you to become a member. To help you avoid paying a year's subscription before knowing whether or not you will enjoy the sport, clubs normally have a temporary membership fee included in the cost of your trial flight.

You will also be asked to sign a declaration that you do not suffer from ailments such as epilepsy, heart problems or dizziness. If you have any doubts, then it does not mean you will not be able to take up gliding, but you should consult your doctor beforehand. His approval may be required. (By the way, your instructor will have been cleared by a doctor before he was allowed to become an instructor).

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ABOUT THE AUTHOR

Ken Stewart started gliding on a holiday course at the Cairngorm Gliding Club in the highlands of Scotland in 1972. By 1976 he held an Instructor's Rating. The following year he joined the instructing staff at Lasham Gliding Centre, reputedly the largest gliding centre in the world. What began as seasonal employment soon became full-time, resulting in his holding the position of Deputy Chief Flying Instructor and for one year, Acting Chief Flying Instructor, while his colleague Derek Piggott took a sabbatical in the USA.

In 1982 he became National Coach for the British Gliding Association and as such was involved in, among other aspects of the sport, the training of instructors, cross-country and competition training. In this role he produced many of the examination papers used by the BGA and flew at the majority of the gliding clubs in Britain.

A keen soaring pilot, he is holder of the FAI Diamond Badge and has flown in many competitions and National Championships.

Despite now working as an airline pilot, he still instructs on both gliders and motor gliders at the Soaring Centre at Husbands Bosworth in Leicestershire. Having flown over 100 types of glider and with considerable tow-plane flying experience, he is an ideal person to produce a manual on gliding.

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