6.0 ALTERNATIVE LAUNCH METHODS

Aerotowing and winch launching are the subject of separate BGA manuals. The following methods of launching gliders are employed at a minority of sites from which these guidance notes have been derived:-

- Tow car launching using the reverse pulley method.
- Bungey launching.

6.1 Tow Car Launching by Reverse Pulley

The following notes have been provided by the Cotswold Gliding Club which operated a reverse pulley system of launching at Aston Down until early 2000

Hazards and General Safety Precautions

- Cables being towed can move sideways and catch people or equipment nearby. If the cable parachute inflates, it can move well beyond the edge of the runway. Do not tow any cable, unless certain that personnel, aircraft and vehicles are clear.
- Do not drive the tow car or any other vehicle at speed over the cable. Incidents have occurred when the cable snagged on the underside of the car, causing damage to the car and serious damage at the launch point.
- Breaking cables can cause serious injury. There must be nobody near the pulley truck during launching. Do not put your head or arm outside the truck during the launch or allow passengers to do so.
- If in spite of every effort to avoid it, the falling cable looks likely to endanger people or property, the tow car must be stopped or the cable released before the cable parachute reaches the ground.

Daily Inspections:

Tow cars

- Oil and coolant levels.
- Tyre condition.
- “Easy-Start” mechanism (as appropriate).
- Release mechanism - lubricated and bolt not bent.
- No junk in back which might impede cable exit.
- Re-fuelling. Switch off the rotating beacon and observe the precautions notice at the fuel point.

Cables

- Fit parachutes and correct hose-sleeved cables.
- Check swivels and shackles.
- All knots in cable must be cut out and re-tied every day.
- Check for kinks in “piano wire”.

Pulley truck

- Position pulley truck, allowing for wind and crops. Consult the Duty Instructor. Never place it in the middle of the runway to avoid cable fouling at the start of the launch and to leave an area clear for gliders landing on runway after a cable break.
- Check operation and secure chocking of pulley truck.
- Leave room between pulley truck and edge of runway for tow car to drive through when using two tow cars.

Preparing to launch (start of day or taking over)

- Obtain briefing on the day’s techniques and special points from the previous driver.
- Check fuel.
- Ensure rotation beacon is on.
- Consider wind strength and direction.
- Check overdrive switch is on (as appropriate).

Launching - general considerations

- Check fuel sufficiently often.
- Use only the right foot on brake or accelerator. It is not necessary and can be harmful to operate both together. Idling revs are sufficient to take up slack, controlled by the brake.
- Always use “D” gear, not 1 or 2 and never put into “Park” until completely stopped.
- Do not carry more than one passenger.
- Ensure spare weak links, tyres and other junk are kept behing gliders at the launch point so that the tow car does not drive over them.
- Do not start launching or continue with ice on the runway.
- Use an observer until sufficiently experienced, to watch light signals, glider, strain gauge and everything else while you drive the car.
- Obtain feedback from pilots and adjust launching technique accordingly.

The Launch

- Ascertain next glider type before each launch.
- Ensure cable has completely detached before returning to pulley.
- Limit speed during return to pulley to minimise fuel consumption and wear.
- Do not drive over cable on return to pulley.
- Slow right down before turning. Avoid leaving rubber on runway to save tyres.

- Check pulley and turn over, if necessary.
- Attach cable - ensure release bolt fully home to avoid bending it during launch.
- Place parachute, hoses etc. so as not to get caught up when releasing and so parachute does not inflate during launch.
- Check for gliders overhead, tractors working nearby and other hazards, before launching.
- Watch the signal lights until they cease flashing and act on a stop signal without question, whatever stage the launch has reached. If after "All-Out" operate the release as well as stopping the car.
- Drive initially on side of runway opposite to pulley. When past glider, cross over runway to lay cable clear of next launch (unless two - car operation).
- Reduce power after initial acceleration according to glider type and wind. Recognise glider type and hence weak link if different from that expected. Be sure to know each glider's weak link colour. Aim for load maximum of 80% of colour range for the weak link but control power during launch by look and feel plus the speed of the car compared with previous launches - not just the strain gauge.
- When launching in strong winds, the car speed judgement becomes more important. It may be no more than walking speed during the latter part of the launch.
- After cable release, speed during parachute descent should be sufficient but not excessive, to lay the cable straight.

> **Note.** Important to watch for "Too Fast" signal throughout the launch.

Emergencies and Eventualities.

Glider unable to release at top of launch: operate tow-car release and stop.

Excessive drift: the parachute can often be kept off the ground until quite close to the pulley. Conversely, it will drift further as a result of stopping to terminate the launch. Accordingly, it is usually better to keep going, rather than chopping the launch, but adjust power to ensure that the cable does not break. If the drift is so extreme that a falling cable could endanger people, buildings, fences etc., stop the car when the glider has reached a safe height but when the cable can fall safely. If the cable looks likely to fall across obstructions, stop just before it reaches the ground. It will then have to be cleared by hand.
In either case, report the incident so that pilots are informed to take appropriate action.

Dealing with Cable / Weak Link Breaks.

- During the early part of the launch when the glider lands ahead - stop so that the moving cable does not endanger the glider. Release the cable and prepare to avoid the glider.
- When the glider is high - decide whether the cable or weak link has broken by the appearance of the parachute.
- If a cable break, stop to avoid dragging kinks through the pulley.
- If a weak link break, keep going but observe where the link falls.
- Be aware of the dangers of towing any cable unless certain that persons and equipment are clear.
- If possible, obtain assistance when dealing with cable breaks.
- Check for kinks in cable before re-commencing to launch.

DO NOT LAUNCH UNLESS IT IS SAFE

Refer to Appendix 3 "Tow car driving at Aston Down" a Paper by Brian Gilmore.

6.2 Bungey Launching

The following notes have been provided by the Midland Gliding Club at The Long Mynd, one of the few clubs that still launch by this method.

Preliminaries

- Whether bungey launching is to take place from the outset or later in the day, there must first be a briefing by the No. 1 Instructor.
- The wind speed must be at least 15kts. for light single seaters and 20 kts. for two seaters. 40 kts. is about the maximum wind speed in which it is safe to operate (largely because of ground handling problems and turbulence near the edge of the hill). The wind direction must be substantially at right angles to the hill at the bungey point.

> **Note.** IF THE WIND IS MORE THAN 10 DEGREES OFF THE HILL AND / OR IS NOT STEADY IN DIRECTION, DO NOT EVEN THINK ABOUT BUNGEY LAUNCHING!

- Sufficient people must be available to provide launch and handling crews. This implies an absolute minimum of 7 people, preferably more.
- It is best not to attempt to combine bungey launching with winch launching. If conditions are not reliable enough to bungey all types to be launched, revert to winch launching.

Preparation For Flight

- Crews should board / change well down wind of the bungey point and ideally, in the lee of the hangar. Gliders and canopies must be carefully safeguarded at all times.

- Pre-flight checks should be done before towing out to the bungey point. Crews should avoid control movements which are likely to upset wing holders and make ground handling difficult.
- Tow gliders slowly to the bungey piont, preferably by towing north before approaching the bungey point, square to the wind. One wingtip holder and a nose walker are sufficient. P1 should hold the airbrakes partly open and the stick forward.
- Gliders with nose skids (C of G in front of mainwheel) should be located in the concrete chock; all other gliders with main wheel in the small depression, nearby.
- Tail holders are optional, necessary only if there is a risk that the wheel brake might not hold the glider. On skid types, the pilot can hold the stick forward and the tail can be held up to increase the resistance of the nose skid on the ground; on other types, the fin can be held back.
- In all cases, the air brakes should be held fully open until the launch (whether or not the wheel brake is activated by the airbrake lever) and the glider held on the wheel brake (if fitted).
- The P1 must be satisfied that the glider is square to the wind. For this purpose, the yaw-string should be observed. If the wingtip holder is struggling, the implication is that the glider is not squarely aligned (or that P1 is belatedly trying to do control checks).

The Launch

There should be an experienced person at the launch point, acting as Launch Director, normally a club instructor, knowledgeable club member or the Duty Winchdriver. This is not a task that a wingtip holder can easily perform although it is sometimes necessary. The bungey rope should be pulled by three people on each leg, standing on the outside of the V, which should be positioned so that the V is narrow (roughly in line with the wingtips) rather than wide, a configuration that dissipates energy in a way useless to propulsion. The crew should be positioned by the Launch Director to ensure that the V is symmetrical about the glider's axis. Normally, at least on person on each leg of the rope should be a knowledgeable club member.

- The bungey rope should be attached to the glider's winch launch hook. The P1 always has the option of pulling off, but only before the rope has been tensioned. The crew then take up the slack and the person directing the launch should ensure that the V remains symmetrical.

PILOTS NEVER PULL OFF THE ROPE WHEN THE BUNGEY IS UNDER TENSION.

CREW NEVER LET GO OF THE ROPE WHEN IT IS UNDER TENSION

- The bungey launch signalling procedure does not follow the revised BGA scheme. Content to proceed, the P1, addressing the Launch Director, points back to indicate asking "clear above and behind?"
- A thumbs up in return gives confirmation. Ready to launch, P1 waves a hand forward to indicate "All Out" and the Launch Director gives a clear command "RUN", reinforced by a vigorous forward movement of the arm (there is always much wind noise at the bungey point)!
- On the command "RUN", the crew should jog down the hill. They should tension the rope fully without over-stretching it. the crew should have been briefed not to let go of the rope at any time during the launch, even if one or more fall over! (they should wait for any fallers to rise). Shouts of "Let go" should be ignored by the crew, they are probably addressed to the tail holder.
- All the pilot can see now is a small section of the rope being tensioned. The launch should take place a second or two after it is clear that the rope is fully tensioned and that the glider wants to leave the chock / depression and no later than 10 seconds after tensioning.

  THE LAUNCH OCCURS WHEN THE PILOT FIRMLY CLOSES AND LOCKS THE AIRBRAKES AND RELEASES THE WHEELBRAKE.

- The very positive movement and sound of closing the airbrakes must, in the pilot's mind, be the essential prelude to every launch and a signal to all concerned that the launch is imminent. At this point, the tail holder (if any) must release his hold upon the glider and retreat smartly. Exceptionally, in the case of a very heavy pilot in the front seat of a K 13 type, it may be necessary to pull down on the tailskid to reduce the down force on the skid which may be preventing forward movement. meanwhile, the wingtip holder merely allows the wing to leave the hand; it is important that no force, forward or backward, is applied to the wing at this point.
- On the point of launch, in gliders where the stick has been held forward to hold the skid on the ground, it should be to a position which will result in a slightly nose-down attitude (in order to gain flying speed as soon as possible). In other glider, such a position can be held just prior to the launch.
- Once the glider starts to move, the bungey crew should continue to apply tension to the bungey rope until it is obvious that the glider is airborne.
- Once the glider is airborne, but not before the bungey rope goes slack, the cable release should be operated. Once well clear of the ground, the glider is turned onto the ridge and climbed away.

Note. Please remember that the bungey ropes are expensive and that their life is not long. However, it can be extended if care is taken to see that the rope is not over-tensioned, and that it is not dragged across the ground. Care must be taken not to drive vehicles over the rope.