# Progress Towards *Winch Driver*

## Notes to the Check-Boxes

**Three Glider Flights by Winch:** Experience on the 'other end' of the cable will help you to appreciate what it is like to be the pilot.

**Basic Theory of Winch Launching:** The *Winch Launch Manual* published by Gliding Australia, last updated in 2021, is a highly readable description of all aspects of winch launching, and very relevant to NZ practice. This should be read prior to winch driver training. Check the Gliding Australia web site for a free downloadable copy or download from the PTP.

**Read Winch Operating Manual:** There is a 'short form' of the manual located in the winch. The 'cables' can be dyneema, wire or rope.

**Safety Precautions with Cables:** A winch cable should always be treated as 'live' and only handled when necessary. When handling always expect that the cable could be snatched, so never wrap it around any part of your body, including hands or fingers. Avoid driving over winch cables if at all possible.

If the yellow flashing beacon (or other signal) on the winch is active it means the winch engine is running and the drum is engaged. Do not handle any winch cable at the launch point until the yellow light has stopped flashing.

**Daily Inspection, Review Log Books:** The daily inspection check list is posted on the winch garage door. There's a copy in the Appendix. Follow it, and make an entry in the Daily Inspection booklet. Do not overfill any fluids (water, oil, transmission fluid). The engine oil can easily be over-filled. If it is close to or below the 'low' mark notify a winch engineer. A visual check of the tyres is sufficient – no need to measure the pressure.

**Towing Winch Behind Vehicle:** Make sure both masts are down before towing. Handle masts carefully - the beacon and radio aerial are both fragile. Ensure that all items are stowed (grounding spike, chocks, drawbar support post). Tow at a sensible speed, to reduce the amount of dust generated and also to preserve the track. Avoid towing on the cable track to protect the grass.

When backing into garage always have an external observer to assist. It's a good idea to walk completely around the winch before driving off.

**Winch Setup on Field:** There is a check list for the winch setup on the front of the winch. Please follow it. The hand-held cable cutter must be accessible to the winch driver in an emergency, and ideally remain in sight at all times in case the guillotine fails. The wind vane should be easily visible from the cab, in the driver's peripheral vision, and is best located 45 degrees forward of the winch at about 10 paces away. Do not park the winch on bare dirt - the spinning drums stir up a lot of dust in dry conditions and the air filter will become blocked. Always park completely on grass.

**Parachute and Strop Inspection:** The sequence of fittings on the cable end are: cable end buffer - parachute - trace (17 metres) - weak link - strop (3 metres) - rings. If the parachute shrouds are not even the parachute will spin and tangle the cable. The cable-end buffer is to ensure that the cable breaks before the parachute is pulled through the rollers. To prevent this happening always bring the parachute to a stop 20 metres in front of the winch. To minimise wear on the parachute ensure that the drum is completely stopped before the parachute lands. This is a safety measure, as a moving cable can do a lot of damage if it snags on something (a fence, a vehicle, a person) but a stationary cable will just fall to the ground. Remove the parachute for de-tensioning a cable and use a tyre instead.

**Cable Car Checks:** The cable car should be checked for adequate fuel, oil and coolant at the start of each day. The cable car is to be kept clean and free of debris, and not used for any other purpose. Check that the tow-out weak links (short lengths of braided cord) are adequate for a day's flying, and that they are used correctly. Also check the radio, the towing brackets and the deck where the parachutes will sit.

Check that the winch engine runs before allowing the cables to be pulled out. If the winch doesn't start for any reason then it's a long job to reel the cables back in by hand. The engine need not run during tow-out, but the drum selector must be in neutral.

**Cable Car Driver Briefing:** The winch driver is responsible for the cable tow-out, and needs to ensure that the cable car driver understands all the procedures. Maximum tow speed is 30 kph. The radio instructions are ‘tortoise’ and ‘hare’ which mean the same as ‘take up slack’ and ‘all out’. These aerotow terms are not used by the cable car in case an aerotow launch is being controlled on the same frequency.

Always check radio operation before allowing a cable to be towed out. If there is a problem then apply the drum brake. The cable weak links will snap and the cables will drop to the ground.

The winch driver is responsible for ensuring the cables are towed out straight, and if there is any curvature in the tow track that the inside cable is used first. This ensures that the active cable does not run over the other cable. One cable running over the other could cause the second cable to melt through. If in doubt then wind the cables back in and tow them out again along a straight path.

Another occasion where one cable can run over another is right at the winch. After the two cables have been pulled out to the launch point then pull out by hand a few metres of the second cable so it lies on the ground. This avoids the possibility of the first cable rubbing over the second cable as the first one is retrieved.

**Clear Area Around Winch:** See the diagram in the winch operating manual. The area around the winch must be kept clear of obstacles and persons in case the cable falls directly over the winch, which could happen in the case of a tail-wind on launch, a cable break under tension near the end of the launch, or a winch fault which prevents a normal cable retrieve after launching the glider.

**Liaison with Launch Point:** Primary liaison with Launch Point Control is by radio on 134.45 MHz. The second liaison is by signal lights. The light at the launch point is used to signal take-up-slack, all-out or stop. The white light on the winch is turned on when the cables are being worked on. If this light is on then the cables are not to be moved except at the direction of the winch driver. The winch light is mostly used when the cable falls over an obstacle and needs to be retrieved by hand. Check all signal lights and the radio before the first launch of the day.

To activate the flashing yellow beacon turn on the ignition and select the left or right drum. The flashing beacon is on whenever a drum is engaged, to ensure that it stays on until the cable is parked in front of the winch after a launch.

**No Passengers and Observers in Cab:** The primary purpose of the second seat is for training and checking winch drivers. A winch driver who has been recently cleared to drive ‘solo’ must not allow anyone else in the cab during a launch until experience has been gained, because the presence of an observer can be distracting when learning. In any case a passenger or observer must remain passive during the launch unless authorised to give instruction or guidance. Allow 20 launches solo.

**Winch Controls, Hand Locations:** Refer to the diagram in the manual. Remember that the hand controls are generally *push* to go and *pull* to stop. The hand positions are important, and should be the same whether the driver is left or right handed.

During a launch the left thumb is placed over the top of the transmit button while the right hand is on the throttle. The thumb or palm of the right hand needs to be positioned behind the throttle knob to avoid the hand slipping off the throttle during launch.

The left hand is also used for the drum selector, the drive lever and the guillotine. The right hand is only used for throttle and brake, in the same way that the right foot is used in a car with automatic transmission.

Learn the meanings of the warning lamps and regularly review all the placards - each one is there for a good reason.

The drum selector can be tricky to operate at times. When selecting a drum ensure that the lever moves beyond the yellow triangle, otherwise the drum may jump out of gear when power is applied. It is much easier to de-select the drum after launch if the brake is not applied, which means anticipating and doing it early, before the need to brake. The drum has inertia and will keep reeling in after the engine is dis-engaged.

**Throttle Guide, Use of Throttle:** The throttle guide is just that - a guide - and does not substitute for the skill and awareness of the winch driver. The guide is used to determine where the throttle is *expected* to be during the full climb.

It is important for glider pilots that the winch is driven consistently and predictably. Every launch should feel the same to the pilot, with due allowance for different wind conditions. This means that drivers must follow the procedure exactly.

Wind settings: For 0 - 4 knots use the 0 setting. For 5 - 9 knots use 5 setting. For 10 to 15 use 10-15 setting.

Taking up slack is done at idle speed. When the all-out signal is given (check the signal light as well) the throttle lever is moved smoothly and at a constant rate from idle to the guide position, taking exactly four seconds for the full movement.

Note that lighter gliders will require a lower guide setting, so the speed at which the throttle is opened will be less, but still spread over four seconds.

Practice the rate of opening before starting the engine. There is no risk of flooding the engine by moving the throttle with the key off.

If the throttle is opened too slowly the glider may not accelerate as briskly as normal, and there is a danger of dropping a wing, which can lead to a cartwheel if the pilot fails to release quickly enough.

If the throttle is opened too quickly the glider tail can slam on the ground, the pilot can be jerked back in his seat, and the glider may pitch up in a manner which the pilot cannot control. This is one occasion where the winch driver can endanger the pilot's life, so never do this. If in doubt then slower is slightly better, especially with single seat gliders. This particularly applies to gliders with all-flying tailplanes. Always pay close attention to the start of the launch.

The throttle guide is set to 'climb power', and the initial power setting is held steady until the glider is at least 45 degrees above the winch. The only exception is when the pilot calls for 'more power' or 'Slow down'.

Drivers will need to develop their own judgement about how much to increase or reduce the throttle in response to these calls. Clues include how hard the engine is revving or labouring, the bow in the rope, and the nose attitude of the glider.

At about the 60-degree point the power is gradually reduced, and by 75 degrees the throttle should be chopped right down to idle, at which point the launch is over and the cable should release from the glider. The brisk power chop should be a clear signal to the glider pilot to lower the nose and reduce tension in the cable.

**Radio Phraseology:** The Skylaunch winch at Papawai is identified as 'Skywinch' to distinguish it from other winches on the field, or on the same frequency. Standard aircraft radio telephony phrases are used. Refer to Appendix 1.

The 'Launch Point' is just that, and the 'Cable Car' is also obvious. When calling, say the station you are calling first, such as 'Launch Point, (this is) Skywinch'.

Read back the throttle guide settings that you have selected, and the cable identifier. There is no need to read back the *take-up-slack* request. Always use the same radio phraseology, as per the placard – this makes it easier to comprehend at the other end.

The terms *left* and *right* are never used - cables are always identified by agreed landmarks at the site, such as *River* side, *Hangar* side and *Orchard* side. It is the responsibility of the winch driver to ensure that the cable on the inside of any curve is used first - this takes precedence over the downwind cable.

**Signal Lights & Glider Signals:** Radio transmissions from other gliders (e.g. downwind calls) are strongly discouraged when a launch is in progress, in case a 'Stop' command is needed, or the glider needs to ask for more or less power. The radio is subject to other transmissions so cannot be relied on completely. For this reason a signal light system is used in conjunction with the radio. A slow flash on the light is *take-up-slack*, a fast flash is *all-out*, and steady-on is *Stop*. If in doubt about a signal or radio command then always stop the launch.

A glider may require more or less power to keep within the relatively narrow speed range allowed. The normal procedure is for the glider to call for "more power, more power" or "slow down, slow down". The winch driver will adjust the throttle accordingly, but not transmit a reply.

There are also non-verbal signals: if the glider yaws from side to side then that means 'slow down'. There is no visual signal for 'more power' because the glider could be stalled by such manoeuvring. However, an experienced driver will see the nose of the glider go down and add a little extra power.

The winch driver may use the radio to ask the glider to offset for a cross wind. Note that the winch microphone is in a noisy environment, so place your mouth very close to the microphone (almost touching) and speak loudly with your 'outside' voice.

All radio instructions are repeated, as the first word is often not heard clearly by the glider pilot. For example, "Go hangar side, hangar side". Likewise glider pilots should also repeat their requests. For example, "more power, more power".

**Engine Temperature Management:** The temperature gauge should operate between the 11 o'clock and 1 o'clock positions. At the start of the day run the engine for 3-4 minutes at low revs, or until the temperature gauge comes off the bottom stop. After two launches in succession to full height the engine can get quite hot and needs time to cool. Keeping the engine idling for two minutes assists this by keeping the fluids (oil and water) circulating and allows an even cool-down.

**Normal Launch Procedure:** This is best learned by demonstration. Normal launch includes managing the tow-out, radio calls, setting the throttle guide, launching and cable retrieve. It will include making and receiving radio calls with the glider using standard phraseology.

**Cable Stopped Before Landing:** A moving cable can do a lot of damage (including killing a person) but a stationary cable is virtually harmless. It is therefore standard practice to have the drum stationary at the point in time when the parachute touches the ground (or anything connected to the ground, like trees, power lines or fences). A skilled winch driver will be able to achieve this with almost no use of the brake, by anticipating the parachute landing - closing the throttle and dis-engaging the winch transmission several seconds in advance.

**Review of Emergency Stop:** There are many reasons for an emergency stop, and most will not be obvious to the winch driver. There may be a 'stop' command transmitted by radio or signal light. If you see the parachute appear, or the winch suddenly revs up, then the glider has released, and the launch should be stopped without waiting for a command to do so.

On the other hand, if you receive a STOP call by radio and the glider is still attached and near to the ground then the STOP call must be disregarded. An example would be if the glider has pitched up suddenly, or rotated too early into the climb.

It has been found from experience that continuing with the launch may allow the situation to resolve itself, but cutting the winch power unexpectedly could cause the glider to crash. After 'all out' - and at a low height - any decision to abandon the launch must be made by the glider pilot, not by the winch driver.

The stop sequence is performed using the right hand. Let the throttle go, move your right hand to the brake lever, apply the brake firmly and hold it on. Then use the left hand to disengage the transmission. Finally, release the brake and disengage the drum. The cable should fall safely to the ground. Do not move the cable again until the situation has been made clear.

Every time the brake is applied the cable (with its own momentum) will keep feeding into the winch, but the drum may not be turning. This can lead to a 'loop' on the drum, which can lead to that section of cable being worn through if the loop is not removed immediately. Always check the drum for loops after every sudden stop.

**Rehearse Use of Guillotine:** When the throttle is dropped to idle at the end of the launch always watch to ensure the cable releases from the glider. Speed the engine up just enough to bring the cable down at a steady rate. If the glider does not release as expected, undo the guillotine safety catch (if not already done), make a radio call urging the glider pilot to pull the release, and then dis-engage the transmission.

Finally, if the glider goes past the 90-degree point and passes directly overhead the winch then pull the guillotine lever. Both cables will be cut. If the guillotine fails to do the job (which is unlikely) then grab the hand-shears and - if safe to do so - get out of the cab and attempt to cut the cable by hand.

**Solo in Cab:** This stage is reached about half-way through driver training. It indicates that all normal procedures (and a few emergency ones) have been understood and demonstrated to an acceptable standard. Drivers should have 20 launches alone in the cab before allowing observers to sit in during a launch.

**Launching in Tail Wind:** Sometimes there may be a light tailwind at the launch point. This may be temporary and not worth changing vectors. With a tailwind the rate of throttle opening may be increased slightly to, say 3 seconds, and it may be prudent to push through the throttle gate slightly as well. But these are very small adjustments.

Another thing to be aware of is to end the launch (cut the power to zero) slightly earlier, to prevent the cable being blown over the top of the winch as you wind it in.

Tailwind launches should only be attempted with experienced glider pilots who can respond quickly to a pending wing drop. Tailwind launches above 5 knots windspeed are not permitted – the risk of a wing drop is too high.

**Launching in Cross Wind:** If there is a headwind component at the launch point the glider pilot can still make a safe launch. In a cross-wind on a narrow site, the cable can land outside the landing area, and drop over trees or fences or into the river. This can take up to half an hour to retrieve, which slows the launching.

The first recourse is to ask the glider pilot over the radio to ‘Go Hangar Side’ (for example), and keep repeating until you get a reaction. If there is no reaction it is probably safer to complete the launch to full height and deal with the cable problem later, rather than abandoning the launch.

This offset instruction is best given early in the launch, as later may be too late and require too much offset. Use your peripheral vision during the launch to check the crosswind at ground level (wind vane), and also observe the crab angle of the glider. Observe whether the cable is on the upwind side of the cable track, as it is possible that the glider may be offsetting but the cable is still drifting to the downwind side. In general crosswinds are not worth the hassle and it is better to change vectors.

**Cable Retrieve After Launch Failure:** The end of the cable (parachute, trace, strop, etc) is normally out of sight in the middle of the airfield. It may be entangled in a fence, or lying over the other cable. For these reasons never move the cable until the 'all clear' has been given. The winch driver must wait for radio confirmation.

If the cable end is within 100 metres of the launch point this means the glider probably didn't get airborne (e.g. a wing drop). In this case it is acceptable for the launch point crew to pull the cable back to the launch point and try again.

If the glider became airborne and there was a (real or simulated) launch failure then the cable could be lying anywhere. In this case the best practice is to wait for the all-clear then retract the cable all the way back to the winch then tow it out straight.

On a few rare occasions (calm winds, glider stayed on track) the partly-retracted cable can be towed directly back to the winch point, but only if there is absolutely no possibility of the two cables becoming crossed.

**Cable Loops, Check after Braking:** Dyneema cables are very sensitive to abrasion damage, and need to be protected from this possibility. A loop on the drum will rub against the winch frame and could easily wear itself through. For this reason loops must not be allowed to remain on the drum.

Running cables do have inertia, and they keep flying into the winch when the drum is braked. So the rule is: if you have to jam on the brake then immediately check the corresponding drum for loops. If a loop is found then pull the cable out (sideways) by hand until the loop is clear. Dyneema cable is expensive, and worth protecting.

**Winch Power Failure - Simulated or Real:** There are certain advantages to having the winch driver 'chop the power' to simulate a launch failure. The parachute falls away from the glider and doesn't pose a risk to the glider pilot. It can be difficult for the winch driver to estimate the appropriate altitude to do this, and higher is better than lower. Having said this, every glider pilot should be able to safely compensate for any fault in the winch.

The procedure is to apply the brake and get the cable falling to the ground with no forward movement. Wait for the all-clear before retracting the cable at idle speed. A skilled instructor may ask for a reduction in winch power - sudden or gradual - to test the ability of a student pilot to recognise and correctly respond to a power failure.

In such case, at the requested altitude, reduce the power and after release apply the brake gently to allow the cable to fall back onto the ground.

**Cable Hang-Up Procedure:** A hang-up is when the cable becomes entangled with the glider and cannot be released in the normal way. This can happen if the glider over-runs the cable and is then launched with the cable tangled around the wheel or some other part of the glider. The plastic hose around the 3m strop is designed to prevent this happening. Taking up slack must therefore be done gently and at idle speed so the glider doesn't jerk forward.

It's rare, but the parachute, trace or strop could wrap around a part of the glider, and may cause damage or jam the controls. This is more likely to happen after release. A hang-up may only become apparent when the glider is at top of launch and cannot release. In this case you would follow the procedure for use of the guillotine.

**Action if Cables Not Towed Out Straight:** The biggest danger is when the first cable picks up the second cable during a launch. A second hazard is that one cable being dragged over another can cut it through. The best response is to retract both the cables and tow them out straight. Alternatively, one cable can be winched back in along the ground and the other then used for a launch.

**Cable Retrieve from Mid Field:** The normal action from a mid-field retrieve is to wind the cable back to the winch and tow it out straight. This is mandatory if there are two cables out. If there is only one cable out then this cable alone may be towed back to the launch point. However, it is generally more efficient to wind in the mid-field cable and tow out both cables from the start.

**Closing Down at End of Day:** Dyneema cables when wound tightly onto the drum put a lot of stress on the drum. The stress can be enough to crush the drum.
It is best practice to tow the cables out about 50 metres beyond the launch point (where possible) and wind the cables in along the ground so they can be de-tensioned. Remove the parachutes and use the tyres on the ends of the cables. Follow the radio procedures on the card in the Cable Car.

**Reporting Winch Defects:** Defects which render the winch inoperable should be reported to a winch engineer as soon as possible. Major and minor defects can be entered in the Daily Inspection log in the document pocket. If the fault is complicated or intermittent (e.g. occasional loss of power) then report or write down as much detail as possible to assist with diagnosis.

**Winch Refuelling Procedure:** The winch uses unleaded 91 octane petrol from the designated containers. Preferably fill the winch outside the winch garage.
If inside then the door must be wide open. Siphon fuel rather than attempt to pour it in from the container. Check that the vent screw in the filler cap is unscrewed and loose, so the tank is vented.

**Cable Splicing - Loop and In-Line:** These procedures are detailed in the manual. There are also video clips on-line. Both types of splice need to be demonstrated and practised using loose lengths of cable.

**Change Broken Weak Link:** This is best done by demonstration. The main thing to watch for is that the slotted end of the link carrier points towards the glider rings. This means the link carrier is not lost if the strop is unable to be retrieved. Ensure that the bolts are snug and don't rattle, but they must not be tight.

**Change Strops and Traces:** Generally a replacement item can be swapped for a serviceable one. If in doubt refer to the diagram in the Operating Manual. Metal shackles need to be firmly tightened by spanner, and checked at the start of every day. The use of lock wire has not proved necessary.

The preferred alternative is to use ‘soft shackles’ made from Dyneema, which have proved very effective and don’t require any tools to undo.

At the end of the day the soft shackles should be left on the winch, attached to the swivels, ready for next use.

**Winch Driver Training:** The Winch Master may authorise experienced winch drivers to act as trainers of other winch drivers. The Winch Master remains responsible for all such delegated training.

**Appendix 1: Standard Radio Phraseology**

# *Launch Point Radio Phraseology*

*Glider Pilot (when all checks complete) transmits: "**Ready** (to launch)"*

**LPC: "Skywinch, Launch Point, <glider>, <cable>, <(head wind)>"**

***Glider** (DG-1000, DG-101 single, LS-8 single, etc)

***Cable Side** (River Side/Hangar Side *or* Hangar Side/Orchard Side)

***Head wind** *(optional - if not changed from previous setting)*

Winch: reads back Throttle Guide setting + cable side (+ wind)

e.g. "Launch Point, Skywinch has Alpha, Hangar side cable, 5 knots"

*Check: does this match the aircraft type?*
*A = glass twin, C = fabric twin, or heavy single, D = single, E = light single*

*Glider Pilot to wing runner: (after listening to + accepting winch settings)*
***"<colour> Weak Link, Belly Hook On"***

**LPC**: all clear + wings level + balanced: **"Skywinch, Take Up Slack"**

# *Skywinch Radio Phraseology*

*LPC: Skywinch, Launch Point, <glider type>, <cable>, <(headwind)>*

[start engine now - assuming it has been warmed up]

**Winch: Read back your Throttle Guide settings + wind + cable side**

***e.g. "Launch Point, Skywinch: Alpha, 10-15 knots, Hangar Side cable"***

*LPC: Skywinch, Take Up Slack* *[readback not required, just do it]*

[Select Drum, Select Drive, Eyes on Signal Lights . . . ]

Placard Version 6.1

## Appendix 2: Winch Operator Check Lists

### *Check List: Winch Preflight at Hangar*

Hand Brake On (for safety)
Winch is Level (for fluid checks)
Guillotine Lever in 'loaded' position + locked
Drum Selector N + Drive Lever N
Tool box, cutters, Dyneema repair kit in cab
Petrol: At least 60 Litres of 91 Octane. Use dipstick. Record quantity in DI book.
Final Drive: oil sight glass is full
Yellow tabs on drum bolts not moved
Front pulleys and rollers free (4 per side)
Main pivots swivel freely, no debris inside
Engine Bay: damage, oil leaks, cables, hoses
Guillotines: linkages, clear inside, loaded
Engine Oil Level (cold - before starting engine)
Coolant Level (engine off when topping up)
Brake Fluid Level (does reduce as pads wear)
Cable ends, shackles tight, traces, weak links
Clean cab windows - including top glass
Electrical Isolator On, all circuit breakers
Program Radio to 134.45 MHz
Start Engine and run 1-2 minutes at idle
Write entry in 'Daily Inspection' book

### *Check List: Winch Setup on Runway*

Winch pointing straight at launch point
Hand Brake On
Winch Level (check bubble)
Earth Stake in ground and lead attached
Wheel chocks in place (aligned to tyre centre)
Hand cutters in view of driver
Two masts elevated
Radio Check (frequency 134.45 MHz)
Driver Headset plugged in and working
Signal Lights and Yellow Rotating Beacon
Guillotine Safety Lock OFF
Drum Selector + Drive Lever N for cable tow
Pull out and check parachutes, traces, strops
Warm up engine - temp gauge at 11 o'clock
Check cable car (and tow-out trailer if used)
Instruct cable-car driver on tow-out path

***Check List:  Winch Close end of day***

Cables reeled onto drums - with no load
Cables fully retracted
Chutes and strops in tray
Guillotine Safety Lock ON
Drum Selector N + Drive Lever N
Cab vents closed
Masts down
Tool Box and Hand cutters in cab
Chocks in cab
Master Switch Off
Doors and Covers Closed
Earth Stake and Lead stowed
Winch Attached to Vehicle
Hitch Stand Fully Up
Hand Brake Off
Final Walk around Winch

***Standard Cable Car Phraseology for Start***

**Skywinch, Cable Car, Request Tortoise**
Tortoise (until stabilised)  . . . .  and Hare (if completely safe to increase speed)

*End of day detensioning when cables fully out*
**Skywinch, Cable Car, Cables Ready for Rewind**
Cable Car, Skywinch, Request Tortoise
**Tortoise** (when clear) . . .  a**nd Hare** (if completely safe to increase speed)

## Appendix 3: Safety Notes

*From the British Gliding Association:*

Accidents from moving winch cables overwhelmingly stem from a person acting on an unwarranted assumption about a cable being clear of aircraft and people.

The majority of these accidents arise from:

1. the cable interfering with a glider and/or pilots on the ground during the glider's retrieval to the launch point
2. launching a glider with a cable lying underneath another glider on the ground
3. driving the cable retrieve vehicle around the back of the launch point and returning to the winch with a cable still attached.

Members should be taught the club's established operating procedure to be followed when towing cables and recovering broken cables. It is particularly important during a departure from an established operating procedure to make absolutely certain that there will be no danger to persons or aircraft from any cable and attached hardware.

## Appendix 4: Training Record of Progress

Refer to following page

# WINCH DRIVER

*Name*

| | Self-Prepared | Reviewed | Date | Completed | Date |
|---|---|---|---|---|---|
| ***Preparation*** | | | | | |
| Three Glider Flights by Winch | | | | | |
| Basic Theory of Winch Launching | | | | | |
| Read Winch Operating Manual | | | | | |
| Safety Precautions with Cables | | | | | |
| Daily Inspection, Review Log Book | | | | | |
| Towing Winch Behind Vehicle | | | | | |
| ***Setup*** | | | | | |
| Winch Setup on Field | | | | | |
| Parachute and Strop Inspection | | | | | |
| Cable Car Checks | | | | | |
| Cable Car Driver Briefing | | | | | |
| ***Authority and Responsibilities*** | | | | | |
| Clear Area Around Winch | | | | | |
| Liaison with Launch Point | | | | | |
| No Passengers or Observers in Cab | | | | | |
| ***Winch Driving*** | | | | | |
| Winch Controls, Hand Locations | | | | | |
| Throttle Guide, Use of Throttle | | | | | |
| Radio Phraseology | | | | | |
| Signal Lights + Glider Signals | | | | | |
| Engine Temperature Management | | | | | |
| Normal Launch Procedure | | | | | |
| Cable Stopped Before Landing | | | | | |
| Review of Emergency Stop | | | | | |
| Rehearse Use of Guillotine | | | | | |
| Solo in Cab | | | | | |
| ***Handling Non-Normal Situations*** | | | | | |
| Launching in Tail Wind | | | | | |
| Launching in Cross Wind | | | | | |
| Cable Retrieve After Failed Launch | | | | | |
| Cable Loops, Check after Braking | | | | | |
| Winch Power Failure: Simulated or Real | | | | | |
| Cable Hang-up Procedure | | | | | |
| ***Other Procedures*** | | | | | |
| Cables Not Towed Out Straight | | | | | |
| Cable Retrieve from Mid Field | | | | | |
| Closing Down at End of Day | | | | | |
| Reporting Winch Defects | | | | | |
| Winch Refuelling | | | | | |
| ***Maintenance and Repair*** | | | | | |
| Cable Splice - Loop and In-Line | | | | | |
| Change Broken Weak Link | | | | | |
| Change Strops and Traces | | | | | |