

Instructor Patter & Demos

The content of this document describes the exercises an instructor uses in pre-solo training. It

- clarifies the instructor's actions, sequenced with the patter, and describes what is expected of the student,
- is adapted from the BGA Instructors' Manual v4,
- uses additional input from the Assistant Instructor Part 2 course.

Where the BGA Instructors Manual specifies or suggests patter, it is used. Additional patter is suggested for those exercises which are described without patter.

Practising the patter in a sim is a very effective way to learn both the patter and its coordination with control usage in flight, even at home.

See also <https://glidingschool.com/instructor-resources/> for a full set of pre-solo theory briefing notes, intended for delivery by an instructor.

Lookout

Instructor Action	Patter	Student Action
During launch or immediately afterwards.	“When flying, we must always keep a good lookout. Help me with this. Scan the field of view, pausing from time to time, looking above and below the horizon, as well as on it. Tell me if you see another aircraft or glider. I will do the same.”	

Elevator

Instructor Action	Patter	Student Action
Establish normal attitude.	"Now I will show you how the controls work, first the elevator."	
	"Follow through on the stick."	Follow through.
<i>Establish the references:</i>	"Look ahead over the nose, and see the relationship between the nose and the horizon, or the amount of ground in view. It remains constant. This is the normal gliding attitude. When I move the stick forward a small amount..."	Look ahead.
Move stick forward	"...the nose of the glider goes down. More ground comes into view, the glider takes up a new attitude, and the speed is increases. When I move the stick back again..."	
Move stick back, → nose below 'normal'	"...the nose rises. There is less ground in view, and we begin to slow down. We are in another attitude."	
<i>If demoing the stall (most clubs do not)</i>	<i>If I move the stick back some more..."</i>	
<i>Move the stick back, → nose above 'normal'</i>	<i>"...the nose rises, then goes down again by itself."</i>	
<i>Wait for the nose to drop.</i>	<i>"I must move the stick forward to regain speed."</i>	
<i>Move stick forward, wait.</i>	<i>"Now I will return the glider to its normal attitude."</i>	
<i>Recover from stall.</i>	<i>"That was a stall."</i>	
<i>If not demoing the stall.</i>	"Now I will return the glider to its normal attitude."	
Establish normal attitude.	"The attitude is steady and speed is constant."	
	"I'd like you to try that. You have control."	Student attempts, to get feel of elevator, and normal attitude.

Ailerons

Instructor Action	Patter	Student Action
Establish normal attitude.	"Now I will show you the effect of the ailerons and how we roll the glider."	
<i>Establish the references:</i>	"Look ahead and see that the cockpit edges are symmetrical [<i>or the top of the instrument panel is parallel</i>] with the horizon. The wings are level. If the wings were not level, the view ahead would like this:"	
Briefly roll to ~20 degrees, both ways, using coordinated controls. Establish normal attitude.		
<i>Request follow through.</i>	"Follow through on the stick."	Follows through.
<i>Establish the need for lookout.</i>	"We are going to change direction, to the <i>left</i> , so we must lookout first. Look <i>right</i> first. Make sure it is clear to the <i>left</i> . Look as far back as you can. Remember to tell me if you see any other aircraft. Now look over the nose."	Student looks out.
	"If I move the stick to the <i>left</i> ..."	
Roll left, without back pressure.	"... the <i>left</i> wing goes down, and continues going down until I centralise the stick."	
Hold ~20 degrees bank.	"The glider is now banked and therefore turning. To maintain the attitude, I need to apply a slight back pressure to the stick."	
Hold attitude, with back pressure.	"To raise the wing, I move the stick to the <i>right</i> , and centralise it as the wings comes level..."	
Centralise wings, easing back pressure.	"...easing the back pressure to maintain the correct attitude."	
	"Now you try – you have control".	Student attempts.
<i>Allow student 2-3 attempts each way, while you operate the rudder to keep string central.</i>		Student gets feel of aileron and elevator together.

Rudder

Instructor Action	Patter	Student Action
Flying a little faster, fly towards a visual reference, in normal attitude. Ideally into / down wind.	“Now I'd like to show you that the rudder does not turn the glider. Follow through, with your feet on the rudder pedals. Note that we are flying towards the reference, with wings level [and the string is central]. If we press the <i>left</i> rudder pedal..”	Follow through, rudder only.
Holding wings level... Press left rudder.	“...the nose of the glider yaws <i>left</i> [and the string goes out to one side], but as long as I keep the wings level, the glider continues to travel in the same direction. When I centralise the rudder, the nose swings back to point in the original direction [and the string is central again].”	
Centralise rudder.	“The rudder only yaws the glider, and does not turn it.”	

Adverse Yaw

Instructor Action	Patter	Student Action
Fly towards a marked visual reference, in normal attitude. Ideally into / down wind.	"Now I will show you another effect of the ailerons, and why we need to use the rudder."	
<i>Request follow through.</i>	"Follow through on stick and rudder."	Follow through.
Lookout.	"Because we will turn in this demonstration, we will lookout in that direction, then over the nose again."	Lookout. Look over nose.
	"Watch what happens when I move the stick to the left <u>without moving the rudder.</u> "	
Brief roll without rudder, inducing adverse yaw.	"Which way did the nose swing (first of all)?"	Confirms has seen adverse yaw.
Repeat if necessary.	"This is adverse yaw. It is the result of aileron drag. To counteract this effect, we need to use rudder in conjunction with the aileron. If we use left/right aileron and rudder together, the nose no longer yaws to the right/left."	
Make 2-3 turns/reversals of ~20 degrees to illustrate.	While turning: "We always use aileron and rudder together, so it is stick and rudder to the left, or stick and rudder to the right."	
	"Now you try that. You have control."	Student attempts.
<i>Prompt student, giving guidance on use of stick and rudder together -e.g. "equal pressure / movement".</i>		

ASI and Airspeed Monitoring

Instructor Action	Patter	Student Action
	"You have control"	Student flies.
<i>Request normal attitude.</i>	"Fly the glider in the normal attitude, and note the ASI reading..."	
<i>Confirm student can read the ASI.</i>	...what is it?"	Reads ASI.
<i>Request 10kts faster.</i>	"Lower the nose to an attitude that will give you a speed of +10kts"	Lowers nose.
<i>Describe holding attitude, waiting.</i>	"Glance at the ASI, while maintaining attitude, until the speed is steady. Notice that it takes some time to increase to the new value."	Holds attitude, waits.
<i>Describe how to adjust if required: corrective adjustment, wait.</i>	"If you haven't got the speed you want, make a further attitude correction. Wait, then check the ASI again."	Changes attitude, waits.

Chasing the ASI

Instructor Action	Patter	Student Action
If required, demo "chasing the ASI". Establish normal attitude.	"If you try to select a new speed solely by watching the ASI, then you will end up chasing the airspeed – let me show you. I have control."	Passes control.
	"If I lower the nose until I get 50kts on the ASI, like this,..."	
Lower nose slowly, chasing 50kts. Hold attitude, to show that speed increases.	...the speed eventually goes beyond it."	
	"If I raise the nose until 50kts is indicated,..."	
Raise the nose slowly, chasing 50kts. Hold attitude, to show that speed decreases.	...then the speed will fall below it."	
<i>Explain "flying by attitude".</i>	"The only way to control the glider is by setting the attitude, and wait for the speed to settle. If it isn't right, adjust the attitude again."	

Trimming

Instructor Action	Patter	Student Action
	"Now I am going to show you how to use the trimmer."	
Take control.	"I have control."	Releases control.
Establish normal attitude, and trim. Explain glider is stable.	"If I take my hands off the controls, the glider continues to fly itself. The glider is stable."	
Pass control.	"Now you take control and continue to fly in this attitude. You have control."	Takes control.
	"I will alter the trim."	
Move trimmer forward.	"You are having to apply a pressure to the stick. Tell me the direction."	Confirms backwards.
Prompt student to trim.	"Now you adjust the trimmer to reduce the stick load to zero. When you have done that, release the stick."	Students attempts.
If not in trim. Relate attitude to speed, and trim.	"No, that's not quite right. Put your hand back on the stick, and select the original attitude. We are now flying at xx Kts, which will do fine. Sense the load on the stick, and trim again. Check by releasing the stick. Now increase the speed to +10Kts. Trim for that speed."	
Establish future expectation.	"From now on always fly in trim."	

The Straight Glide and Scan Cycle

- The Straight Glide

Instructor Action	Patter	Student Action
Establish normal attitude, into/down wind. <i>Explain 'normal attitude'.</i>	“Now I'm going to show you the straight glide, and how to recognise and achieve it. Follow through on the controls. This is the normal gliding attitude . Look ahead over the nose and see the relationship between the nose and the horizon, or the amount of ground in view. Also that the wings are level.”	Follows through.
<i>Establish not straight & level:</i>	“If the picture over the nose is wrong,...	
Demonstrate return to straight flight:	...we roll the wings level, using ailerons and rudder together, centralising the controls when the wings are level, and select the correct pitch attitude with the elevator.”	
<i>Ask student to practise.</i>	“I will now put the glider into a different attitude, and I want you to return it to the normal wings level gliding attitude...”	
Set up an incorrect attitude.	...You have control.”	Student flies and returns to normal attitude.

The Straight Glide and Scan Cycle

- The Scan Cycle

Instructor Action	Patter	Student Action
Take control, demonstrate the scan cycle.	<p>"I have control. I will now show you how to maintain the straight glide and perform the scan cycle. The sequence of events is:</p> <ul style="list-style-type: none"> • Lookout, • Attitude, • Instruments. <p>Begin by looking directly ahead. Focus on the horizon, looking above and below it. Move your head to the 2 o'clock position. Focus on the horizon, looking above and below it. Move your head to the 3 o'clock position. Focus on the horizon, looking above and below it. Now look as far back as possible, then directly upwards, above the glider. Look forward again. Check the attitude. If it is not correct, level the wings with coordinated aileron and rudder, and use the elevator to return the glider to the normal gliding attitude. Check the trim. Instruments:</p> <ul style="list-style-type: none"> • Check the yaw string is central. • Variometer: Check the glider's rate of sink or climb. • Altimeter: Do we have enough height to continue on this course, or should we be starting our return to the airfield? <p>And now back to lookout, this time to the left..."</p>	As directed.
Ask student to practise.	"Now you try. You have control"	Student tries.

Turning - Lookout

Instructor Action	Patter	Student Action
Take control.	"I have control."	
<i>Explain there are three stages to a turn.</i>	<p>"Now I will show you how to turn the glider, using all three controls together.</p> <p>There are three stages to the turn:</p> <ul style="list-style-type: none"> • Going In • Staying In • Coming Out." 	
<i>Explain the lookout actions before a turn.</i>	<p>"Before turning, we must look round and behind the wing outside the turn. Then scan ahead of the glider, above and below the horizon. Then inside the turn and as far back as possible.</p>	Lookout.

Turning - Going In

Instructor Action	Patter	Student Action
<i>Direct student to look ahead.</i>	"Look ahead, over the nose."	Look over nose.
Roll into a moderate turn.	<p>"Roll the glider, using aileron and rudder together.</p> <p>At the desired angle, use the aileron to stop the angle of bank increasing, and reduce the amount of rudder.</p> <p>As the angle of bank increases, keep the attitude constant with a slight backward pressure on the stick."</p>	
Hold the turn.	"The glider is now established in the turn."	
<i>Establish need to lookout in the turn.</i>	"Now lookout again."	

Turning - Staying In

Instructor Action	Patter	Student Action
Hold a steady rate of turn.	"Notice how the nose moves steadily around the horizon."	Look over nose.
<i>Explain the need to lookout, especially in the direction of the most likely threat.</i>	"Continue the scan cycle and keep a good lookout, especially in the direction of the turn."	Scans.
<i>Explain how to stay in.</i>	"Keep the angle of bank constant, making any necessary corrections with aileron and rudder together. "	

Turning – Coming Out

Instructor Action	Patter	Student Action
<i>Explain the need to lookout before coming out, especially in the direction of the most likely threats.</i>	"To come out of the turn, we must first lookout. Check that it is clear to straighten up, especially behind, and below the upper wing. Other gliders may have joined you."	Lookout.
<i>Explain rolling out.</i>	"Roll the wings level, using aileron and rudder together, relaxing the back pressure as you do so, centralising the controls..."	
Roll level.	...when the wings are level."	
<i>Summarise.</i>	There three stages to the turn: Going In, Staying In, Coming Out.	
<i>Direct student to attempt.</i>	"Now you try that. You have control."	Student attempts.

Maintaining a Heading

Instructor Action	Patter	Student Action
<i>Incorporate into the Scan Cycle patter, using this when checking Attitude.</i>	"If the nose has moved away from the original heading, then we roll gently back towards it. As we reach the original heading, we roll the wings level, check and correct the pitch attitude."	

Turning – Slip & Skid

Instructor Action	Patter	Student Action
Lookout. Set up a balanced turn.	"Follow through on the controls."	Follows through.
Set up a slip (under-ruddered turn), draw attention to string.	"I have used too little rudder. Notice the yaw string is deflected outwards."	
	"I need to increase the amount of rudder, to bring the yaw string back to the centre, while keeping the angle of bank constant."	
Correct the turn with rudder.		
Set up a skid (over-ruddered turn), draw attention to string.	"I have used too much rudder. Notice the yaw string is deflected towards the inside of the turn"	
	"I need to reduce the amount of rudder, to bring the yaw string back to the centre, while keeping the angle of bank constant."	
Correct the turn with rudder.		
Set up for student to attempt.	"I will set up a poorly balanced turn, and I would like you to correct it. You have control."	Student attempts.

Straight Flight – Correcting Yaw

Instructor Action	Patter	Student Action
Take control, not following through.	"I have control. Please keep your hands and feet off the controls."	Let go.
Set up yawed flight, wings level.	"Notice that although we are flying straight, the yaw string is off to one side. Also notice that the controls are crossed."	Confirms.
	"To correct this, I use rudder to centralise the string, while keeping the wings level with the ailerons."	
Return to straight flight.		
Set up yawed flight for student to correct.	"We are out of balance again. I'd like you to correct it. You have control."	Student attempts.

Stalling (HASSLL)

Perform a HASSLL check before each height loss exercise

Instructor Action	Patter	Student Action
HASSLL check	"Before I show you the stall and recovery, we do a HASSLL check."	
	" Height is adequate, bearing in mind the distance from the airfield and the likely height loss."	
	" Airframe is the limiting speeds , which are Max Manoeuvring xx Kts, and Never Exceed xxx Kts."	
	" Security – Are there any loose articles?"	
	" Straps – Are yours tight?"	
	" Location – not over towns or active airfields, or in active airspace."	
	" Lookout – Making sure it is clear all around and below."	
Fly 2 S turns of 180 degrees each.	"Tell me if you see any other aircraft"	Lookout
<i>If in a side-by-side 2-seater.</i>	"Is it clear on your side?"	Lookout

Stalling (Unaccelerated, or 1G): Slow Flight & Stall with Nose Drop

Instructor Action	Patter	Student Action
Establish normal attitude, into wind, slow.	"Now I will show you the symptoms of the approaching stall. Look ahead and follow through on the controls."	Looks ahead, Follows through.
	"If the nose is raised even a little bit above the normal attitude..."	
Raise nose just above normal attitude.	"...the airspeed reduces, the noise of the airflow changes. It is quieter."	
<i>If applicable</i> , waggle the ailerons a little.	"The effect of the ailerons changes."	
Draw attention to the unusual position of the controls.	"Note that the stick is a long way back compared to normal, even though the attitude is not very different."	
Depending on symptoms present.	"The ASI and Vario may flicker....and the glider buffets. - Note the airspeed when it buffets."	
	"In spite of my efforts to hold the nose up,..."	
Provoke nose drop: Move stick back.	...it drops. To recover, ease forward on the stick...	
Ease stick forward, and recover.	...regain normal flying speed, and smoothly return to the normal gliding attitude. A smooth recovery is required to avoid a secondary stall."	

Stalling (Unaccelerated, or 1G): Mush & Stall with Wing Drop

Instructor Action	Patter	Student Action
Establish normal attitude, ease stick back to mush .	"We are now flying with the stick hard against the back stop, and the glider is stalled, or 'mushing'. Look at the high rate of sink."	Observes stick. Checks vario.
	"Recover as before: Ease the stick forward (more than a nose drop)."	
Ease forward.	...regain normal flying speed, and return to the normal gliding attitude."	
Recover to normal attitude.	"A smooth recovery is required to avoid a secondary stall."	
If a wing drops...	"A wing may drop. Recover by moving the stick centrally forward ..."	
	...regain normal flying speed, level the wings with coordinated use of the controls, and return to the normal gliding attitude."	

Stalling (Unaccelerated, or 1G):**Stall with Airbrakes or Spoilers Open**

Instructor Action	Patter	Student Action
Fly the 1G stall with nose drop, with the airbrakes closed.	"Note the airspeed at which the glider buffets (and stalls)."	Confirms ASI reading at the stall.
Direct the student to note the differences.	"Now we will repeat the stall, with the airbrakes open." "Note the symptoms, and the speed at which the glider buffets, or stalls."	
Open the airbrakes, repeat the 1G stall, and recover.	"The recovery must include closing the airbrakes before easing out of the dive."	
Discuss the differences.	"What symptoms did we see / were missing?" "At what speed did the glider stall?" "Note that the airbrakes must be closed during the recovery"	Tells you the differences. Notes the higher ASI reading when stalled.

Accelerated Stalls:**Stall in a Turn**

Instructor Action	Patter	Student Action
Fly the wings level 1G stall to the point of the buffet..	"Note the airspeed at which the glider buffets (and stalls) with the wings level."	Confirms speed at the stall.
Direct the student to note the differences.	"Now we will see what is different when the glider stalls in a turn. Tell me at what speed the glider buffets."	
Enter a 30 degree bank turn. Slow gradually to the stall. Draw attention to the control positions.	"Note the unusual control positions required to maintain the attitude and angle of bank."	
When the buffet starts.	"Note the airspeed compared to the unaccelerated stall."	Confirms the airspeed.
Continue until fully stalled, then recover.	"Recovery is the same as when the glider stalls with a wing drop."	
Repeat the exercise, but prevent the stall at the buffet.	"When the glider buffets, the stall can be prevented by relaxing the back pressure on the stick."	

Accelerated Stalls:**Stall in a Steep Turn**

Instructor Action	Patter	Student Action
Fly the wings level 1G stall to the point of the buffet..	"Note the airspeed at which the glider buffets (and stalls) with the wings level."	Confirms speed at the stall.
	"Now we will turn steeply and note the speed at which the glider buffets."	
Turn steeply, 60 degrees of bank, increase the back pressure until buffet becomes marked. When the buffet starts.	"Note the airspeed compared to the unaccelerated stall."	Confirms the airspeed.
Demonstrate recovery.	"Reducing the back pressure on the stick immediately reduces the G, and is normally sufficient to recover."	
Highlight the need for higher speed in a steep turn.	"More speed than normal is required to sustain a tight turn without stalling."	

Accelerated Stalls:**Stall in a Climbing Attitude: simulated wire launch failure**

Instructor Action	Patter	Student Action
Accelerate to c. 50kts, then enter a 30 degree climb. Draw attention to symptoms.	"Note the attitude and the rate at which speed is being lost. Also the absence of some of the stall symptoms – until the nose drops. The nose drop is severe."	
Describe and perform the recovery	To recover, move the stick forward, despite the nose being down already.	
	Wait for the speed to build, then ease out of the dive smoothly."	

Further Stalling Exercises:**Reduced G is not a symptom of the stall**

Instructor Action	Patter	Student Action
	"Now I will show you that reduced G is not a symptom of a stall. First, I will stall the glider as a reminder."	
Dive to 55kts, then pull up into a moderate climb, c. 30 degrees. Note the symptoms as they occur:	"Notice the sensation, low airspeed and ineffective elevator."	
When stalled:	"We are stalled. Stick forward to recover"	
When recovered:	"Now we will look at reduced G."	
Dive to 55kts, then pull up into a moderate climb, c. 30 degrees. At about 5kts faster than the stall, push over to create the same sensation as the stall.	"Notice the same sensation, but this time the elevator is effective and airspeed is OK. We are not stalled. Stick back to recover. The sensation of reduced G is an unreliable symptom of the stall."	

Further Stalling Exercises:**Lack of Effect of the Elevator at the Stall.**

Instructor Action	Patter	Student Action
BGA recommend performing this exercise at around 700' AGL, for visual impact.	"I will now show you how ineffective the elevator is at the stall."	
Dive to c. 55-60kts, then climb steeply, wait for the stall.		
As the nose drops, move the stick fully back and knock it against the back stop two or three times.	"No matter how hard I pull back on the stick, I cannot raise the nose. The elevator is ineffective. I must move the stick forward to unstall the glider before I try to raise the nose."	
Move the stick forward and recover. Summarise.	"If you ever find that the elevator will not raise the nose, or prevent it dropping, you must take the stall recovery action."	

Further Stalling Exercises:**High Speed Stall.**

Instructor Action	Patter	Student Action
Fly the wings level 1G stall to the point of the buffet and stall.	"Note the airspeed at which the glider buffets (and stalls), starting from the normal gliding attitude." (NGA).	Confirms speed at the stall.
Recover and set up the exercise.	"Let's see if the glider can be stalled at a higher speed in a similar attitude."	
Dive to 55-60kts and pull up into a fairly steep climb.	"I am going to completely stall the glider."	
When the nose starts to drop, ease the stick forward as in a normal stall recovery, then ease it back to "recover" to the NGA.	"If I recover from the stall normally, but pull back too soon..."	
As soon as the glider stops pitching down (<i>apparently recovered in the NGA</i>), and if speed is below 55kts, pull the stick to the back stop (<i>over-recovering</i>). Wait.	"The glider buffets and stalls at a higher speed – notice the ASI reading – even in the normal gliding attitude."	Reads ASI, confirms stalled at a higher speed in the NGA.
Stick forward to recover normally.		

Further Stalling Exercises:

Stalling Speed Increases in a Turn.

Instructor Action	Patter	Student Action
Fly the wings level 1G stall to the point of the buffet and stall.	"Note the airspeed at which the glider buffets (and stalls), starting from the normal gliding attitude." (NGA).	Confirms speed at the stall.
Bank at 20 degrees, slowing to the stall.	"Now we will increase the angle of bank, then slow the glider to the stall. Tell me the speed at which it buffets."	Confirms speed at the stall.
Relax the back pressure to recover.	"By relaxing the back pressure on the stick, the glider recovers."	
Repeat at 40, 60 degrees of bank.	"Note that the speed at which the glider buffets increases as the angle of bank increases, but is the same for each angle of bank. It is dependent on the G-load and the AoA. Note also that the controls become less effective near the stall. The stall can be prevented by relaxing the back pressure on the stick."	

Spiral Dive

Instructor Action	Patter	Student Action
Take advantage of any inadvertent spiral dives.	"Note the increasing speed, increasing G and the low(er) rate of rotation. "	Confirms
Ease back on the stick to demonstrate increasing G.	"The controls are effective... This is a spiral dive."	
Recover before speed builds too much.	"To recover, level the wings with coordinated aileron and rudder, and ease out of the dive."	

Spin

Under-Banked, Over-Rudderred (UBOR) Turn

Instructor Action	Patter	Student Action
Set up a typical spin scenario.	"Imagine you have got a little low and far away from the airfield. So you fly slowly to stretch the glide..."	Confirms
Slow to min sink, or less.	"Notice that the nose is not high – only just above the NGA."	Confirms
Check height on the ASI (having previously completed HASSLL checks)	"Reaching the Final Turn, the ground looks close, so you only bank a little."	
Bank a little.	"The glider does not turn quickly enough, so you bring the nose round faster with the rudder."	
Apply excess rudder, allowing nose to drop.	"This appears to work because the glider looks as if it is turning more quickly."	
As the nose starts to drop...	"The nose starts to go down. You try to stop it with the elevator..."	
Bring the stick back.	"..but even with the stick fully back the nose won't come up."	
When spinning...	"We are now spinning..."	
Point out the symptoms.	Notice the low or flickering ASI reading, the high rate of rotation, the normal G. The stick is back and not raising the nose."	Confirms
Recover.	"Full opposite rudder, centralise ailerons, stick progressively forward until the rotation stops. Centralise rudder, recover from the dive."	

Further Spinning Exercises

Changing Effect of Rudder at the Stall

Instructor Action	Patter	Student Action
Fly at normal speed.	"Notice we are flying at the normal speed. I am going to apply full left/right rudder. I want you to tell me how much the glider yaws and rolls."	Confirms
Apply full rudder, without adjusting ailerons. Wait a couple of seconds.	"How much yaw and roll was there?"	Tells you lots of yaw and not much roll.
Recover and fly just (1kt) above the stall.	"Notice that we are now flying just above the stall."	Confirms
	"I am going to apply full left/right rudder again. Tell me how much yaw and roll you see this time."	
Apply full rudder, without adjusting ailerons. Wait.	"How much yaw and roll was there?"	Tells you lots of roll and not much yaw.
Confirm what happened, and how to recover.	"The glider is in entering a spin (etc)." "Recover..." "Misuse of the rudder near the stall makes the glider spin."	

Further Spinning Exercises

Spin off a Steep or Thermal Turn

Instructor Action	Patter	Student Action
Fly at a speed a little above the accelerated stall speed for a steep turn, then enter a well banked turn (45 degrees).	"Imagine we are low, in a narrow thermal. Notice that we are flying well above the normal flying speed. The nose looks to be safely below the horizon."	Confirms
Increase rudder, hold angle of bank and pitch (or otherwise provoke a spin).	"Misuse of the controls causes a spin. Recover as normal."	

Further Spinning Exercises

Stall & Spin From a Normal Approach Attitude, Following a Cable Break

Instructor Action	Patter	Student Action
Prepare student for the demonstration.	<p>"Following a recovery from a cable break launch failure, it is possible to spin the glider in the normal approach attitude if you have not accelerated to a safe speed first."</p> <p>"Let's remind ourselves what the approach attitude looks like."</p>	
<i>Part One:</i> Fly in the approach attitude, at the approach speed c 55kts.	"This is what the approach attitude looks like. Note the ASI reading. This is safe."	Confirms
<i>Part Two:</i>	"Now I will show that the glider can be flying in the same attitude at a much lower speed following a winch launch failure."	
Increase speed to 70kts. Raise the nose to mimic a winch launch. As the speed decreases to the stall speed...	"The cable has broken."	
Lower the nose to the previous approach attitude, and bring the stick back to hold that attitude.	"We are in the approach attitude, but much slower."	Confirms
Hold the mush then recover.		
<i>Part Three:</i>	"Now I will show what can happen if a turn is commenced before sufficient speed is regained."	
Increase speed to 70kts. Raise the nose to mimic a winch launch. As the speed decreases to the stall speed...	"The cable has broken."	
Lower the nose to the previous approach attitude, then immediately commence a turn, bringing the stick back to maintain the attitude.	"If I turn too soon..."	
When the glider spins:	"the glider stalls and spins,..."	
Recover. Note the height loss.	"Note the height we lost. Imagine that during a winch launch failure."	Gulps.

<i>Part Four:</i>	"Now let's see how to recover safely."	
Increase speed to 70kts. Raise the nose to mimic a winch launch. As the speed decreases to the stall speed...	"The cable has broken."	
Lower the nose to the Recovery attitude, then wait for the recovery speed	"Wait for the recovery speed. We now have 55kts. It is now safe to turn if we cannot land ahead."	

Further Spinning Exercises

Spin to the Left Off a Right Turn

Instructor Action	Patter	Student Action
Prepare student for the demonstration.	"When recovering from a wing drop, you must regain speed and recover carefully. Too much rudder, too soon, can cause a spin in the opposite direction."	
Set up an under-banked turn to the right. Bring the glider to the stall, making sure the right wing drops."	"Applying too much opposite rudder now causes a spin."	
Apply full opposite rudder, provoking a spin to the left.		

Circuit – The Normal Circuit

<p><i>Before the flight</i>, agree on the ground:</p> <ul style="list-style-type: none"> • The Landing Area • The Reference Point <p><i>...subject to changes in flight.</i></p> <p>Fly the “ideal” circuit for the student to reference in similar conditions.</p>	<p><i>The precise sequence of events in this exercise will vary according to circumstances, especially your position and height when the decision is made to land.</i></p> <p><i>Radio calls will depend on site requirements, and time in hand – Aviate, Navigate, Communicate.</i></p>	
Judging height, angle, distance:	<p>“Judge your height and distance from the landing area by reference to the size and detail of ground features. Check your height is correct for your distance from the landing area. When height and distance are both correct, the angle when looking at the landing area will also be correct. We can judge our position in the circuit by reference to any two of height, angle, distance.”</p>	
Before the High Key Area (HKA)	“Make the decision to land.”	
Pre-circuit checks.	<p>“Before starting a circuit, configure the glider for landing: Undercarriage is down, or fixed in this glider.</p> <p>Security: straps are tight and there are no loose objects.”</p>	
Select the landing area and determine the layout of the circuit and the position of the HKA.	<p>“Look at the airfield. Use the windsock to judge & specify the Wind direction and strength. Choose a specific landing area. Assess the effect of any crosswind. In a strong crosswind, position the HKA further upwind.</p> <p>Now select the direction of the circuit and the position of the High Key Area.”</p>	
Fly to the HKA	Judge height and distance e.g. if somewhat too high: “We are a little high, as we can tell by the size of fields, houses, and the lack of detail... so we will fly towards / beyond the HKA.”	
Confirm the approach speed, and trim for it.	“The approach speed will be nn Kts, and the trim is adjusted. For now, fly at Best LD, increasing speed in sink.”	
Take hold of the airbrake lever.	“Now look at the (blue) Airbrake lever and take hold of it with your left hand. Keep hold of it until the end of the ground run.”	

As you reach circuit height.	“Judging our height now by looking at houses, trees, etc, we can see more detail. This is starting to look like circuit height, [so we go to the HKA.]”	
At HKA	“Now in the High Key Area, with wings level , check the height, angle and distance to the landing area, and that it remains clear. Lookout, then start the downwind leg. Radio call.”	
On downwind leg	“ Lookout: Convince yourself no-one else is in or joining the the circuit from any other direction: look left, ahead, right, and across the airfield. With wings level , check the height, angle and distance to the landing area, and it remains clear . Check String is central, Speed is OK [specify] and Vario for sink.”	
Approaching Low Key Area	“Now abeam the Landing Area, confirm it is clear, and let the glider fly at the approach speed . With wings level , check the height, angle and distance to the landing area, and it remains clear . Select the Reference Point , and the position of the Final Turn and Base Leg , (based on the current conditions).”	
At Low Key	“ Lookout left, ahead, right, and behind. Check String is central, Speed is OK [specify] and Vario for sink. Turn onto Diagonal Leg.”	
On Diagonal Leg	“With wings level , check the height, angle and distance to the landing area, and it remains clear . Lookout for gliders joining the circuit, especially on long final and opposite circuit, and behind. Check String is central, Speed is OK [specify] and Vario for sink. Turn onto Base Leg.”	
On Base Leg	“With wings level , check the height, angle and distance to the landing area, and it remains clear . Lookout for gliders on opposite circuit or approaching from further out. Check String is central, Speed is OK [specify] and Vario for sink. Make a well banked Final Turn to align with the landing area. ”	

Circuit – Too Close, Too Far Away

Instructor Action	Patter	Student Action
Fly towards HKA, ideally as if on an extended downwind leg.		
In HKA, at 900'	"We are in the HKA: the height, angle and distance look OK."	
Fly towards the airfield. When too close:	"We are now too close for the height we have. I will now angle away. Tell me when we intersect the downwind leg (at the right height / angle / distance)."	Says when in position for a downwind leg.
On the "correct" downwind leg...	Hopefully the pupil tells you when it looks right. Comment accordingly.	
Fly further out.	"I will now fly out a bit further to show you the picture when we are too far away for the height we have."	
Too far out.	"This is too far away, so I will fly towards the right position, so that the height, angle and distance are correct. Tell me when we intersect the downwind leg (at the right height / angle / distance)."	Says when in position for a downwind leg.

The Approach

Instructor Action	Patter	Student Action
After the Final Turn <i>Position it a little higher and further back than normal for the demonstration.</i>	<p>"Speed is OK at e.g. 55kts."</p> <p>"Fly towards the RP, which is <i>the line as agreed before....</i>, until clearly overshooting it.</p> <p>Check wings are level and the string is central.</p> <p>Open airbrakes half to two-thirds."</p> <p>"Speed is...., String is OK."</p> <p>"Hold the RP steady - control it with Airbrakes."</p> <p>"Monitor speed - control it with Elevator."</p>	

The Landing

Instructor Action	Patter	Student Action
Approaching the roundout	<p>"Look well ahead now.</p> <p>Roundout now.</p> <p>Ease the stick back to hold off, hold off.."</p>	
On touchdown	<p>"Full Airbrakes, Stick fully back.</p> <p>Independent use of the controls until we stop. Ailerons to keep wings level, steer with rudder."</p>	

The Winch Launch

Instructor Action	Patter	Student Action
When accepting the cable, through to rotation	<p>"I have accepted the cable so now my hand stays on the yellow knob until the launch is over.</p> <p>Make separate use of the controls until airborne.</p> <p>When speed is sufficient, allow the glider to rotate into the climb."</p>	
After rotation, in the full climb	<p>"Now I am monitoring the speed by reference to the ASI, and the angle of the climb by reference to the wing-tips against the horizon.</p> <p>Keep the string straight by use of coordinated controls."</p>	
At the top of the climb	<p>"The angle of the climb is decreasing,... allow the glider to level off, and release.</p> <p>Trim for the normal attitude."</p>	

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Take-off

Instructor Action	Patter	Student Action
Take-off is initially a demonstration.	"I have accepted the cable, so I will keep my left hand on the yellow cable release knob until the launch is over. If at any stage during the ground roll I cannot keep the wings level, I will release immediately. I will start the ground roll with the stick <i>Back/Neutral</i> because the glider sits on its <i>Nose/Tail</i> . "	
Lookout, before the rope tightens.	"Before the rope tightens, check that it is still clear ahead, and that there is no conflicting traffic."	
When the glider starts to move.	"Use the controls independently: steer with the rudder to keep directly behind the tug. Keep the wings level with aileron. Use the elevator to balance the glider on its main wheel." <i>Glider sitting on its nose:</i> "I start with the stick on the back stop until the glider is balanced on the main wheel. I will then need to progressively move the stick forward to keep the glider balanced on the main wheel until the glider becomes airborne..." <i>Glider sitting on its tail:</i> "I start with the stick neutral until the tail lifts. I will then balance the glider on its main wheel until it becomes airborne..."	
As the glider becomes airborne.	"Once the glider is airborne, move the stick progressively forward to remain about 6' – 10' above the ground until the tug takes off, and keep the wings level with coordinated ailerons and rudder."	
As the tug becomes airborne.	"Be ready for the tug to climb, and climb with it, whilst adopting the tow position."	
Describe the rope break recovery options as they become available.	e.g. "We can land ahead. Now can land in the field ahead. Now we can turn safely." etc.	

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Vertical Positioning

Instructor Action	Patter	Student Action
When positioned correctly	"This is the normal position for the glider on tow. Use the tug's vertical position in the canopy as an attitude datum."	Notes the picture ahead.
Lowering to the slipstream.	"We can confirm this is the correct position by locating the tug's slipstream. Notice the buffet as we descend into it. Note the vertical position of the tug in relation to the glider's canopy."	Confirms noted the position when reaching the slipstream.
Rising to position just above the slipstream.	"The correct position is just above the buffet of the slipstream. Move up into smooth air, then note the tug's position in the canopy."	Confirms.
Demonstrate the low tow position, and recovery back to the normal tow position.	"If the tug's position on the canopy rises, the glider is descending relative to the tug. This is the low tow position, just beneath the tug's slipstream. If the tug moves down the canopy, the glider is ascending in relation to the tug."	
Demonstrate the high tow position, and recovery back to the normal tow position.	"Now I will show you the highest safe position. If you are any higher than this, you must immediately descend, or release from tow."	
Demonstrate recovery to the normal tow position.	"To move back to the correct vertical position behind the tug, raise or lower the nose as appropriate, until the tug is in the correct attitude reference position. Use the elevator as necessary to keep it there. The glider will then adopt the correct position."	Cheers

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Lateral Positioning

Instructor Action	Patter	Student Action
In the normal tow position.	"Now I will show you how to control the glider's lateral position. Use the tug's wings as the datum for the angle of bank. In straight flight, the glider is directly behind the tug."	
Ask the tug pilot to fly straight. Demonstrate moving laterally.	"If the glider's wings are not at the same angle of bank as the tug's, then the glider will move off-line in the direction of the lower wing."	
Return to the correct position laterally.	"Correct this by bringing the wings parallel with the tug's. Do not allow the inside wing to go down. Allow the rope to pull the glider back into position."	
Ask the tug pilot to commence a gentle turn.	"When the tug turns, use the same angle of bank as the tug. Use coordinated controls to point the glider's nose towards the tug's outer wing tip, or thereabouts. Higher than usual force is required on the rudder pedals to coordinate with ailerons and eliminate adverse yaw."	
Ask the tug pilot to fly straight again	"Now matching the tug's angle of bank, allow the glider to be pulled behind the tug for straight flight."	

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Adverse Yaw on Tow

Instructor Action	Patter	Student Action
In the normal tow position.	"Now I will show you why we must always use rudder with aileron on tow. I will make some small aileron movements without rudder – notice how much adverse yaw occurs."	
Create a yawing oscillation by making a series of very small aileron movements without any rudder.	"Notice how much yaw there is."	Confirms
	"Now with coordinated use of aileron and rudder..."	
Repeat, using coordinated rudder.	"There is no adverse yaw."	Confirms
Summarise	"Even for tiny aileron movements, enough pressure must be applied to the rudder to move it, to achieve coordination."	Confirms

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The Release

Instructor Action	Patter	Student Action
In the normal tow position, approaching release height.	"Before releasing, check the position of the airfield, with a quick look for references. Check the tug's position. Then lookout in preparation for a turn, keeping half an eye on the tug. Look ahead, and check the rope is under tension. Pull the release. Check the rope has released – you can see it ripple towards the tug, and you can see the rings moving away."	
When clear of the rings. Comply with local rules for the release and separation.	e.g. "For maximum separation, promptly raise the nose, then turn left / away from the tug."	
Establish normal gliding attitude.	"Return to the normal flying speed, and trim the glider."	
Locate the airfield.	"Look for the airfield, and if you cannot see it, watch where the tug goes."	