4.5.12 **Aerobatics** ("Utility" Category)

Execute only the approved manoeuvres.

Approved manoeuvres
(Utility Airworthiness Category)

1. Spins		
2. Inside Loop	Entry Speed	200 km/h (108 kts)
3. Stall turn	Entry Speed	200 km/h (108 kts)
4. Chandelle	Entry Speed	200 km/h (108 kts)
5. Lazy Eight	Entry Speed	200 km/h (108 kts)

Spins:
Caution: Prolonged spinning is only possible at **aft C.G. positions**, this means single seated. It is not necessary to extend the dive brakes during spin recovery. The DG-500 ELAN TRAINER shows a very large nose down pitch after leaving the spin. So you have to flare out correspondingly. With **forward C.G. positions** prolonged spinning is not possible. The DG-500 ELAN TRAINER will terminate the spin by itself after a certain number of turns dependent on the C.G. position. The nose down pitch and speed will be high so with these C.G. positions not more than 1 turn spins should be executed, to avoid high g-loads.

With **medium** C.G. **positions** there is a tendency that the spin will turn into a spiral dive after 1 or 2 turns. Reaching this state you have to recover immediately.
Recover always with the ailerons neutral.

Inducing the spin: (Normal procedure)
Gradually bring the sailplane into a stall. When it starts to burble, pull the stick back completely and kick in full rudder in the spin direction.

Recovering from the spin:
Apply full opposite rudder against direction of the spin, pause, then ease the stick forward until the rotation ceases, centralize the controls and carefully pull out of the dive. The ailerons should be kept neutral during recovery.
Height loss during recovery is approx. 50-80 m (160-260 ft), the max. speed is max. 200 km/h (108 kts).

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Stall turn:

After reaching the entry speed of 200 km/h (108 kts) pull back the stick quickly but not abruptly. After reaching a vertical flight path return the stick to neutral.
When a speed of 130-140 km/h (70-75 kts) is attained, push the rudder quickly, but not abruptly, fully into the desired direction.

After the rotation starts slightly opposite aileron and stick forward gives best result.

When reaching the vertical dive you should flare out immediately to minimize speed increase and g-load.

Warning:

If the rudder is pushed too late and the rotation is insufficient, it could be that the glider tailslides (falls tailwards).
If this happens, it is important to hold all controlls strongly, preferable at one of the stops until the nose swings down and then flare out immediately.

Aerobatics (Aerobatic Category)
Execute only the approved manoeuvres.
Don't execute aerobatics below the safety altitude required by national law.
Approved manoeuvres (Aerobatic Category):
All manoeuvres approved for Utility category and:

Inverted flight	recommended speed 130-200 km/h (70-108 kts)
Slow roll	entry speeds 180-200 km/h (97-108 kts)
Half roll and half loop	150-170 km/h (80-92 kts)
Half loop and half roll	220 km/h (119 kts)

Caution: The DG-500 ELAN TRAINER is a high performance sailplane. Therefore the speed increase in the dive, especially in inverted flight is high. Therefore training aerobatics should only be executed after a rating with an experienced pilot or if you can master the manoeuvres on other sailplane types.
In any case don't try to execute the manoeuvres with entry speeds other than those listed above.

Inverted flight:
the speed in inverted flight should preferably be choosen between 130-200 km/h (70-108 kts). At speeds greater than 205 km/h (111 kts) no full control deflections are allowed.

Warning: When the speed is reduced below the minimum speed (depending on weight and c.g. position 105 - 125 km/h, 57-67 kts) the DG-500 ELAN TRAINER enters an inverted stationary stall with high sink-rate. This will be indicated by buffeting of the tailplane.
The aircraft nose may point far below the horizon and the airspeed may show 130 - 150 km /h (70 - 81 kts). The efficiency of the ailerons and rudder will be reduced considerably.

Note:
The inverted stalled flight must be recovered by neutralizing the stick until the buffeting of the tailplane stops. The airspeed will increase very quickly. As soon as this condition is reached, raise the glider nose above the horizon by gradually pushing the stick forward.
Regain normal flight by a half roll.

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Half loop and half roll:
After reaching the entry speed of 220 km/h (119 kts) pull the stick quickly, but not abruptly until reaching the inverted position, where the speed should still be 130 to 140 km/h (70-75 kts). Then return the stick to neutral and keep the nose slightly above the horizon. Then apply full aileron in the desired direction. After the wing passes the vertical position apply upper rudder to keep the nose above the horizon until normal flying position is reached.

Note:
If the nose is raised too much above the horizon or the inverted speed is too slow, a stall can occur when the wing reaches the vertical position and the glider finishes the rolling motion as a "flicked" roll into normal flying position.

Half roll and half loop:
After reaching the entry speed of 150-170 km/h (80-92 kts) the nose must be raised to 10 - 20° above the horizon. After returning the stick to neutral apply full aileron into the desired direction to start the half roll. After the wing passes vertical position the stick has to be pushed slightly (never abruptly) forward to keep the nose above the horizon. When reaching inverted flight the ailerons must be neutralized and the speed must be reduced to 120-130 km/h (65-70 kts) by pushing the stick forward before starting the half loop to level out.

Note:
If during the entry the nose is raised too high or the entry speed is too low, it could be that it is impossible to stop the rotation in the inverted position and the glider continues the roll into normal position.

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Slow roll:

After reaching the entry speed of 180 - 200 km/h (97-108 kts) the nose must be raised slightly above the horizon. After returning the stick to neutral, full aileron has to be applied in the desired direction. After the wing has passed the first vertical position the stick is to be pushed slightly (never abruptly) forward to keep the nose above the horizon. When the wing passes the second vertical position the rudder must be applied upwards to keep the nose above the horizon until normal flying position is reached.

Note:

If during the inverted flight, the nose is raised too high above the horizon and the speed is reduced too much a stall could occur when the wing reaches the second vertical positon and the roll is finished as a "flicked"

The stall is indicated by buffetting of the tailplane.