0.1 **Record of revisions**

Any revision of the present manual, except actual weighing data, must be recorded in the following table and in case of approved sections endorsed by the responsible airworthiness authority.

The new or amended text in the revised page will be indicated by a black vertical line in the right hand margin, and the Revision No. and the date will be shown on the bottom left hand of the page.

Rev. No.	Affected pages / section	Description	Issue Date	LBA Approval Date	Inserted Date Signature
1	0.3,2.8, 2.9,4.8	TN 348/1T	Mar. 92	31.03.92	
2	0.4,7.2	TN 348/3T	Oct. 92	08.12.92	
3	0.3,1.2, 4.14	TN 348/4T	Oct. 94	26.10.94	
4	0.3,0.4, 1.3,4.1, 4.2, 4.3, 5.2, 5.5, 5.6, 6.2, 6.4, 6.7, 7.1, 7.9, 7.10	TN 348/9	Oct. 97	26.11.97	
5	0.3, 0.4, 4.5, 7.7, 8.2	TN 348/15	Jan. 01	07.02.01	
6	0.4, 7.5, 7.5a	TN 348/16 Parking brake/ Piggott-hook	February 2004	25.02.04	
Rev. No.	Affected pages / section	Description	Issue Date	EASA Approval Date	Inserted Date Signature
7	0.3, 0.4, 2.6, 2.7 3.1-3.4, 4.1, 4.5, 4.11, 7.1, 7.7, 7.8	TN 348/20 manual revision	May 2008	August 1. 2008	
8	0.4, 9.1, 9.2	Special equipment for very small pilots TN500/02	May 2010	20.07. 2010	
9	0.1, 0.3, 0.4, 4.5, 4.6, 7.1, 7.10	TN500/13 Canopy lock, rear locking rods	July 2019	17.09. 2019	
10	0.1, 0.3, 0.4, 2.6, 4.14-4.17	TN500/16 Aerobatics	June 2023		approval under the authority of DOA Ref. EASA.21J.530 13.June 2023

0.2 List of effective pages

Section	page	issued	replaced	replaced	replaced
0	0.0	Dec.90			
	0.1	/			
	0.2	/			
	0.3	see record of revisions			
	0.4	"			
	0.5	May 90			
1	1.1	May 90			
	1.2	Dec.90	Oct. 94		
	1.3	May 90	Oct. 97		
	1.4	"			
	1.5	"			
2 App.	2.1	May 90			
"	2.2	"			
"	2.3	"			
"	2.4	"			
"	2.5	"			
"	2.6	"	May 08	June 23	
"	2.7	"	May 08		
"	2.8	"	March 92		
"	2.9	"	March 92		
3 "	3.1	May 90	May 08		
"	3.2	"	May 08		
"	3.3	"	May 08		
"	3.4	May 08			
4 "	4.1	May 90	Oct. 97	May 08	
"	4.2	"	Oct. 97		
"	4.3	"	Oct. 97		
"	4.4	"			
"	4.5	"	Jan. 01	May 08	July 19
"	4.6	"	July 19		
"	4.7	"			
"	4.8	"	March 92		
"	4.9	"			
"	4.10	"			
"	4.11	"	May 08		
"	4.12	"			
App.	4.13	"			

0.2 List of effective pages (cont.)

Section		page	issued	replaced	replaced	replaced
4	App.	4.14	"	Oct. 94	June 23	
	"	4.15	May 90	June 23		
	"	4.16	May 90	June 23		
	"	4.17	June 23			
5	"	5.1	May V			
	"	5.2	"	Oct. 97		
	"	5.3	"			
	App.	5.4	"			
		5.5	"	Oct. 97		
		5.6	"	Oct. 97		
6		6.1	May 90			
		6.2	"	Oct. 97		
		6.3	"			
		6.4	"	Oct. 97		
		6.5	"			
		6.6	"			
		6.7	"	Oct. 97		
7		7.1	May 90	Oct. 97	May 08	July 19
		7.2	"	Oct. 92		
		7.3	"			
		7.4	"			
		7.5	"	Febr. 04		
		7.5a	"	Febr. 04		
		7.6	"			
		7.7	"	Jan. 01	May 08	
		7.8	"	May 08		
		7.9	"	Oct. 97		
		7.10		Oct. 97	July 19	
8		8.1	May 90			
		8.2	"	Jan. 01		
		8.3	"			
		8.4	"			
		8.5	"			
9		9.1	May 90	May 10		
		9.2	May 10			

Approved manoeuvres Category Aerobatic:
All manoeuvres approved for category Utility and:
Inverted flight
Slow roll
Half roll and half loop
Half loop and half roll
Combination of approved manoeuvres see section 4.5.12
Recommended entry speeds see section 4.5.12.

2.10 **Manoeuvring load factors**

The following load factors must not be exceeded:

Airworthiness category:		Utility		Aerobatic	
at manoeuvring speed	VA	+ 5.3	-2.65	+7.0	-5.0
at max. speed	VNE	+ 4.0	-1.5	+7.0	-5.0
airbrakes extended	VNE + 3.5				

2.11 **Flight crew**

a) single seated
max. load in the front seat 110 kg 242 lbs.
min. load in the front seat see placard in cockpit and weighing report page 6.5
b) two seated
max. cockpit load is 210 kg (463 lbs.) with a max. of 105 kg (231 lbs.) in the front seat or 110 kg (242 lbs.) in the front seat and 90 kg (198 lbs.) in the rear seat.
min. cockpit load in the front seat is the min. cockpit load see a) minus 40% of the load in the rear seat. This means that 10 kg (22 lbs.) in the rear seat replaces 4 kg (8.8 lbs.) missing cockpit load in the front seat.
With these loads, the C.G. range given under 2.8 will be kept in the limits if the empty weight C.G. is in its limits. see loading chart in sect. 6.
Either the front seat or the rear seat may designated as seat of the pilot in command.
If the rear seat is to be designated it must be assured that all necessary operating items and instruments are installed and that the pilot in command has sufficient training in flying safely from the rear seat.

Caution: With lower pilot weights lead ballast must be added to the seat. Ballast put on the seat (lead ballast cushion) must be fastened at the safety belt anchorage points. Installation for removable trim ballast see sect. 7.16.1.

Note: For Australia the lower limit for the min. load in the cockpit should not exceed 66 kg (146 lbs.). A provision for removable ballast see sect. 7.16.1 is mandatory.

Category A, Aerobatic

Execute only the approved manoeuvres.
Don't execute aerobatics below the safety altitude required by national law.

Approved manoeuvres (Category A, Aerobatic):
All manoeuvres approved for category U, Utility and additionally:

Approved manoeuvres	**recommended airspeed**	**g-load**
Inverted flight	140 - 200 km/h (76 - 108 kts.)	-1
Lines in inverted flight max. 45^up or downwards	140 - 220 km/h (76 - 119 kts)	-1 to -2g
Positive loop from inverted to inverted	Entry speed 140 km/h (76 kts) Max. speed at bottom 220 km/h(119 kts)	+3 to +4g
	Entry speeds	
half loop and half roll	220 km/h (119 kts.)	+5.0
half roll and half loop	180 – 200 km/h (97 - 108 kts.)	+4.5
slow roll	180 - 200 km/h (97 - 108 kts.)	+/-1.5
Rolling circle with in or outside roll	190 - 220 km/h (103 - 119 kts)	+/-2g
Humpty Bump: Like loop, but with marked vertical line, afterwards pulled or pressed Humpty	200 - 220 km/h (108 - 119 kts.) Pulling at min. 100km/h (54kts) pressing at min.110km/h (60kts)	+3 to+4g +1,5g -1,5g
Combinations of approved manoeuvres		

Caution: Inverted spinning with the DG-500 is not approved. Only spinning from normal flight attitude is approved.

Caution: The DG-500 is equipped with a powerful longitudinal trimming device. In addition the mass balance weight of the elevator is incorporated in the elevator control system. Due to these facts the elevator control forces during inverted flight change considerably with trim position.

It is strongly recommended to trim the glider to approx. 140 km/h (76 kts.) in horizontal flight prior to executing aerobatics, especially prior to inverted flight.

Inverted flight

The speed in inverted flight should preferably be chosen between 120-200 km/h (65-108 kts.). At speeds greater than 185 km/h (100 kts.) no full control deflections are allowed.

Warning: When the speed is reduced below the minimum speed (depending on weight and c.g. position 120 - 135 km/h, 65-73 kts.) the DG-500 ELAN ORION enters an inverted stationary stall with
high sink-rate. This will be indicated by buffet-
ing 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.

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 170-180 km/h (92-97 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 130-140 km/h (70-76 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.

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.
When the wing passes the vertical position the rudder must be applied a little in upwards 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 position and the roll is finished as a "flicked" roll.
The stall is indicated by buffeting of the tailplane.

Rolling circle:
If flown during roll with elevator correction in the blade positions and corresponding rudder correction up, a roll circle will occur.
Note: Care must be taken to maintain the required speed and rudder deflections so as not to create a stall!

Humpty-Bump:
Humptys are only allowed from normal flight attitude! For the Humpt, the entry speed is to be selected somewhat higher than for a turn, i.e. approx. 220 km/h (119kts).
After a strong pull up into the vertical, this line is to be stabilized until the speed is reduced to 100 up to 120 km/h (54 up to 65kts). The Humpty is to be flown in the vertical position. Then the rollover (loop without movement around the transverse axis) is initiated with full pulled elevator or full pushed elevator, whereby the speed for pushing is to be selected higher than for pulling.
During the rotation, hold the stick in the fully pulled or pushed deflection without aileron deflection. It may happen that the airplane turns over at too low speed at the top or takes a slight backward phase, which is to be avoided.

Due to the large span and the resulting large moment of inertia, executing flick manoeuvres is more difficult than with smaller aerobatic gliders. Therefore you should not try these manoeuvres solo unless you have trained and mastered them on other gliders

Combinations of approved manoeuvres
Combinations of approved manoeuvres may also be flown if the operating limits are observed.

Caution: If the operating limits have been exceeded during a flight, a comprehensive inspection of the entire airframe must be performed before the next take-off. If damage is discovered, the manufacturer must be informed and, if necessary, a repair procedure determined by him must be performed.