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För LUFTFARTSVERKET

FLIGHT MANUAL

for the

SAIL PLANE

DG-500 ELAN Trainer

Model: DG-500 ELAN TRAINER
German Data Sheet No.: 348

Factory Serial No.:

5E55T22

Registration No.:

SE-UOK

Date of Issue:

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Pages as indicated by "App." are approved by:

(Signature)

A. G. W.

(Authority)

Anerkannt durch
Luftfahrt-Bundesamt

(Stamp)



(Original date of approval)

07. Dez. 1990

This sailplane is to be operated in compliance with information and limitations contained herein.

The original German Language edition of this manual has been approved as operating instruction according to "Paragraph 12(1) 2. of Luft-Ger Po".

Approval of translation has been done by best knowledge and judgement. In any case the original text in German language is authoritative.

Flight Manual DG-500 ELAN TRAINER

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	

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0.1

Rev. No.	Affected Pages/ section	Description	Issue Date	LBA Approval Date	Inserted Date Signature
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0.2 List of effective pages (cont.)

<u>Section</u>	<u>page</u>	<u>issued</u>	<u>replaced</u>	<u>replaced</u>
4	App. 4.16	May 90		
5	" 5.1	"		
	" 5.2	"	Oct. 97	
	" 5.3	"		
	App. 5.4	"		
	5.5	"	Oct. 97	
	5.6	"	Oct. 97	
6	6.1	"		
	6.2	"	Oct. 97	
	6.3	"		
	6.4	"	Oct. 97	
	6.5	"		
	6.6	"		
	6.7	"	Oct. 97	
7	7.1	"	Oct. 97	
	7.2	"	Oct. 92	
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	7.5	"	Febr. 04	
	7.5a	"	Febr. 04	
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0.3 Table of contents

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Flight manual DG-500 ELAN TRAINER

Section 1

1. General

1.1 Introduction

1.2 Certification basis

1.3 Warnings, cautions and notes

1.4 Descriptive data

1.5 Three view drawing

1.1 Introduction

The sailplane flight manual has been prepared to provide pilots and instructors with information for the safe and efficient operation of the DG-500 ELAN TRAINER sailplane.

This manual includes the material required to be furnished to the pilot by JAR Part 22. It also contains supplemental data supplied by the sailplane manufacturer.

1.2 Certification basis

This type of glider has been approved by the Luftfahrt-Bundesamt (LBA) in accordance with:

JAR Part 22 sailplanes and powered sailplanes
Change 4, issued 7th May, 1987.

The Type Certificate No. 348 has been issued on
December 7th 1990.

Category of Airworthiness: "Utility" or "Aerobatic"
if equipped properly.

1.3 Warnings, cautions and notes

The following definitions apply to warnings, cautions and notes used in the flight manual.

- Warning:** means that the non observation of the corresponding procedure leads to an immediate or important degradation of the flight safety.
- Caution:** means that the non observation of the corresponding procedure leads to a minor or to a more or less long term degradation of the flight safety.
- Note:** draws the attention on any special item not directly related to safety but which is important or unusual.

1.4 Descriptive data

The DG-500 ELAN TRAINER is a twoplace high performance sailplane.

- automatic hook ups for all controls
- comfortable seating and modern cockpit design similar to the DG-single seaters - safety cockpit
- large 2 piece canopy for very good inflight visibility
- draught free canopy demist and 1 adjustable swivel air vent for each pilot
- sealed airbrake- and landing gear box
- complete set of controls in each cockpit
- a choice of retractable or fixed main wheel, both spring mounted
- nose wheel and tail wheel
- carbonfibre wings

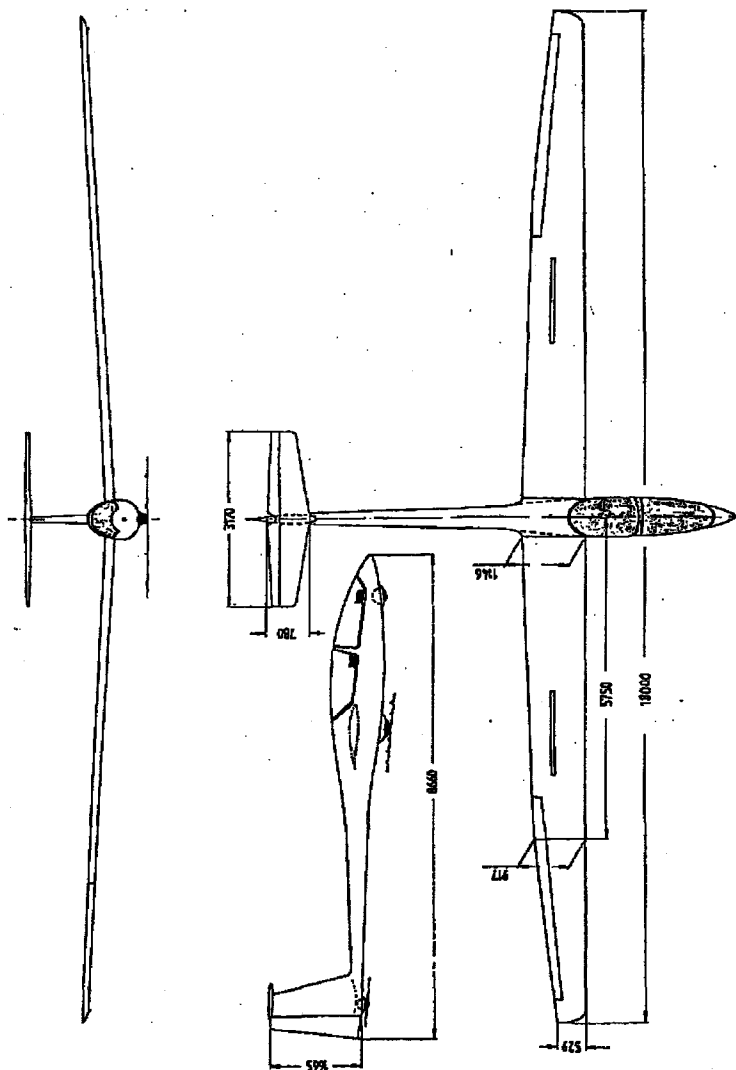
TECHNICAL DATA

wing span	18 m	59 ft
wing surface	16.6 m ²	179 ft ²
aspect ratio	19.5	
length	8.66 m	28.4 ft
fuselage width	0.73 m	2.4 ft
fuselage height	1.00 m	3.3 ft
horizontal tailplane span	3.17 m	10.4 ft
empty weight	ca. 390 kg	860 lbs
max. TOW	615 kg	1356 lbs
wing loading(payload 80 kg, 176 lbs)	ca. 28.3 kg/m ²	5.8 lbs/ft ²
wing loading max.	37 kg/m ²	7.58 lbs/ft ²

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1.5

3 view drawing



Issued: May 1990

1.5

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Section 2

- 2. Limitations
 - 2.1 Introduction
 - 2.2 Airspeed
 - 2.3 Airspeed Indicator Markings
 - 2.4 Section not effective
 - 2.5 Section not effective
 - 2.6 Section not effective
 - 2.7 Weight
 - 2.8 Center of Gravity
 - 2.9 Approved manoeuvres
 - 2.10 Manoeuvring load factors
 - 2.11 Flight crew
 - 2.12. Kinds of operation
 - 2.13 Minimum equipment
 - 2.14 Aerotow and Winch- and Autotow - launching
 - 2.14.1 Weak links
 - 2.14.2 Towing cable
 - 2.14.3 Max. towing speeds
 - 2.14.4 Tow Release
 - 2.15 Cross wind
 - 2.16 Tyre pressure
 - 2.17 section not effective
 - 2.18 Section not effective
 - 2.19 Limitations Placards

2.1 Introduction

Section 2 includes operating limitations, instrument markings and basic placards necessary for safe operation of the sailplane, its standard systems and standard equipment.

The limitations included in this section have been approved by the LBA.

2.2 Airspeed

Airspeed limitations and their operational significance are shown below:

	Speed	(IAS) km/h(kts)	Remarks
VNE	Never exceed speed flaps 0° up to -10°	270 (146)	Do not exceed this speed in any operation and do not use more than 1/3 of control deflection.
VRA	Rough air speed	205 (111)	Do not exceed this speed except in smooth air and then only with caution. Rough air is in lee-wave rotor, thunderclouds etc.
VA	Manoeuvring speed	205 (111)	Do not make full or abrupt control movement above this speed, because under certain condition the sailplane may be overstressed by full control movement.
VW	Maximum winch-launching speed	140 (76)	Do not exceed this speed during winch- or auto-tow-launching
VT	Maximum aerotowing speed	205 (111)	Do not exceed this speed during aerotowing
VLO	Maximum landing gear operating speed	205 (111)	Do not extend or retract the landing gear above this speed

Warning: At higher altitudes the true airspeed is higher than the indicated airspeed, so VNE is reduced with altitude see sect. 4.5.9.

2.3 Airspeed Indicator Markings

Airspeed indicator markings and their color code significance are shown below:

Marking	(IAS) value or range km/h	(kts)	Significance
Green Arc	80 - 205 (43 - 111)		Normal Operating Range (Lower limit is maximum weight 1.1 VS1 at most forward c.g. with flaps neutral. Upper limit is rough air speed.)
Yellow Arc	205 - 270 (111 - 146)		Manoeuvres must be conducted with caution and only in smooth air.
Red Line	270 (146)		Maximum speed for all operations.
Yellow Triangle	100 (54)		Approach speed at maximum weight

2.7 Mass (weight)

Maximum Take-Off mass: 615 kg, 1356 lbs

Maximum landing mass: 615 kg, 1356 lbs

Maximum mass of all
non lifting parts = 435 kg (959 lbs)
Maximum mass in baggage
compartment = 15 kg (33 lbs)

Caution: Heavy pieces of baggage must be secured to the baggage compartment floor (screwing to the floor or with belts). The max. mass secured on one half of the floor (left and right of fuselage centre line) should not exceed 7,5 kg (16.5 lbs).

Warning: Follow the loading procedures see sect. 6.

2.8 Center of gravity

Center of gravity range in flight is

185 mm (7.28 in.) up to 480 mm (18.9 in.) behind datum.

datum = wing leading edge at the rootrib

reference line = aft fuselage centre line horizontal
C.G. diagrams and loading chart see sect.6.

Warning: Flying is only allowed with the battery Z 07 installed in the fin as otherwise the forward C.G. limit may be exceeded.

2.9 Approved manoeuvres /

Airworthiness category "Utility":

This sailplane is certified for normal gliding and simple aerobatics.

The following aerobatic manoeuvres are approved see sect. 4.5.12:

Manoeuvre	recommended entry speed IAS	
	km/h	kts
Spins	/	/
Inside Loop	200	108
Stall Turn	200	108
Lazy Eight	200	108
Chandelle	200	108

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Approved manoeuvres (Category Aerobatic):

All manoeuvres approved for category Utility 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)

2.10 Manoeuvring load factors

The following load factors are not to 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

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.

Caution: With lower pilot weights the necessary 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 min. load in the cockpit should not exceed 66 kg (146 lbs). A provision for removable ballast see sect. 7.16.1 is mandatory.

2.12 Kinds of operation

- Flights according to VFR (daylight)
 - Aerotow
 - Winch- and auto-launching
 - Cloud flying (daylight): permitted when properly instrumented (see below).
 - Simple aerobatics see sect. 4.5.12 (Category Utility)
 - Aerobatics see sect. 4.5.12 (Category Aerobatic) if properly instrumented (see below)
- Note: Cloud flying is not permitted in the USA, Canada and Australia.

2.13 Minimum equipment

As minimum equipment only the instruments and equipment specified in the equipment list (see maintenance manual) are admissible.

Note: The actual equipment list is filed in the enclosures of the maintenance manual.

a) Normal operation

Airspeed indicator

Range: 0-300 km/h (0-165 kts)

Speed range markings see sect. 2.3

Altimeter

Altimeter with fine range pointer,

1 turn max. 1000 m (3000 ft.)

Magnetic compass (compensated in the aircraft, only required in Canada)

Four piece symmetrical safety harness

VHF - transceiver (ready for operation) with noise absorbing earphones

Battery Z 07 installed in the fin

Parachute automatic or manual type or a back cushion approximately 8 cm (3 in.) thick.

Required placards, check lists and this flight manual

b) In addition for cloud flying (Not permitted in the USA, Canada and Australia)

Magnetic Compass (compensated in the aircraft)

Variometer

Turn and bank indicator

Remark: Experience has shown that the installed airspeed indicator system may be used for cloud flying.

c) In addition for aerobatics

Airworthiness Category "Aerobatic":

Accelerometer capable of retaining max. and min. g-values with markings red radial lines at +7 g and -5 g.

Safety bows at the rudder pedals (standard equipment)

2.14 Aerotow, winch and autotow launching

2.14.1 Weak links

10 000 N \pm 10%
2 200 lbs \pm 10%

2.14.2 Length of the towing cable

for aerotow 30-70 m (96 - 225 ft)

Material: hemp- or plastic fibres

2.14.3 Max. towing speeds

Aerotow VT = 205 km/h, 111 kts

Winch- and autotow VW = 140 km/h, 76 kts

2.14.4 Tow Release

The C.G. tow release (installed in front of the main wheel) is suitable only for winch- and auto launching.

The nose hook is to be used only for aerotow.

2.15 Crosswinds

The maximum crosswind component according to the airworthiness requirements for take-off and landing is 15 km/h (8 kts).

2.16 Tyre Pressure

Main wheel	2.5 bar	36	psi
Nose wheel	2.5 bar	36	psi
Tail wheel	4 bar	58	psi

2.19 Limitations placards

ELAN			
Type:	DG-500 ELAN Trainer		
Year of construction:			
Serial No.:	SE T		
Maximum airspeeds	km/h	kts.	
Winch launch	140	75	
Aero-tow	205	110	
Manoeuvring V _A	205	110	
Rough air	205	110	
Landing gear operating	205	110	
Maximum speed V _{max}	270	145	
Approved aerobatic manoeuvres (category utility U): pos. Loop, Stall Turn, Chandelle, Spin			
In addition category A: half loop and half roll, half roll and half loop, slow roll, inverted flight.			
Maximum mass: 615 kg (1356 lbs.)			
Loading chart			
Cockpit load (parachute included)			
	front seat		rear seat
maximum	110 kg	243 lbs	96 kg 213 lbs
or maximum	165 kg	231 lbs	105 kg 231 lbs
minimum	kg	lbs	

Gepäck max. 15kg
Baggage max. 33lbs.

Cockpit Check	
1. Lead helmet (for underweight pilot)?	
2. Parachute worn properly?	
3. Safety harness buckled?	
4. Front seat: pedals adjusted?	
Rear seat: seat height adjusted?	
5. All controls and knobs in reach?	
6. Altimeter?	
7. Dive brakes cycled and locked?	
8. Positive control check?	
(One person at the control surfaces).	
9. Trim?	
10. Both canopies locked?	

Reifendruck 2,5 bar
Tyre pressure 36 psi

nose wheel

Reifendruck 2,5 bar
Tyre pressure 36 psi

main wheel

Alt. m	0-2000	3000	4000	5000	6000
VNE Km/h	270	255	243	230	216
Alt. ft	0-6500	10000	13000	16000	20000
VNE Kts	145	138	131	124	117

Reifendruck 4 bar
Tyre pressure 58 psi

tail wheel

Sollbruchstelle 10000 N
Rated load 2200 lbs.

Other cockpit placards see sect. 7.

Section 3

3. Emergency procedures

3.1 Introduction

3.2 Canopy jettison

3.3. Bailing out

3.4 Stall recovery

3.5 Spin recovery

3.6 Spiral dive recovery

3.7 Recovery from unintentional cloud flying

3.6 Spiral dive recovery

Apply rudder and aileron in opposite direction and carefully pull out of the dive.

Spiral dive occurs only when spinning more than 2 turns with medium C.G. positions, see sect. 4.5.12.

To prevent spiral dives intentional spinning should only be executed at the C.G. positions specified in sect. 4.5.12 without waterballast.

Recovery from unintentional spinning should be done immediately.

3.7 Recovery from unintentional cloud flying

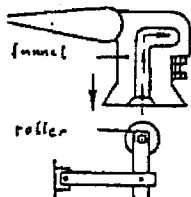
Spins are not to be used to lose altitude. In an emergency, pull out the dive brakes fully before exceeding a speed of 200 km/h and fly with max. 200 km/h (108 kts) until leaving the cloud. At higher speeds up to VNE, pull out the dive brakes very carefully because of high aerodynamic and g-loads.

4. ff

Set the stabilizer on, so that the roller at the fuselage side push rod is inserted into the funnel at the elevator.

Watch carefully the procedure.

When the stabilizer is set down and laying on the fin, push it aft. The roller will slide forward in the funnel if you hold the elevator in the pertinent position.



Release the securing device by pulling out with the tool and engage the securing device by lifting the tool. The securing plate must be flush with the surface of the fin. Screw out the tool.

Check for correct elevator connection by looking from the rear into the gap at the right hand side of the rudder.

5. Tape the gaps of the wing-fuselage junction.

6. Positive control check.

4.2.4 Derigging

Derigging follows the reverse of rigging. Lock the airbrakes.

For disassembling the securing pins of the wings the tool W 38/2 must be screwed into the bolt completely.

The brass part of the tool will then disengage the securing of this bolt.

It is recommended to leave the securing bolt in the right wing as long as you derig the left wing.

4.4 Preflight inspection

1. Lead ballast (for under weight pilot)?
2. Parachute worn properly?
3. Safety harness buckled?
4. Front seat: pedals adjusted?
Rear seat: seating height adjusted?
5. All controls and knobs in reach?
6. Altimeter?
7. Dive brakes cycled and locked?
8. Positive control check? (One person at the control surfaces).
9. Trim?
10. Both canopies locked?

4.5 Normal procedures and recommended speeds

4.5.3 Launch

Due to the towhook position being in the middle of the fuselage and the excellent effectiveness of the ailerons and rudder, the possibility of wing dropping or ground loops, even on a slow starting aerotow is reduced. Take-off with strong crosswind is possible.

Aerotow

- a) Aerotow is permitted only using the nose tow release. Set trim to neutral for aerotow.
- b) Pull the stick until the nose wheel lifts off from the ground. Then control the airplane so, that nose wheel and tail wheel don't touch the ground. Don't try to lift off before you reach an airspeed of 80 km/h (43 kts) (without ballast).
On a rough airfield hold the control stick tight. The undercarriage can be retracted at safety height during the tow.

Normal towing speed is 120-130 km/h
(65 - 70 kts).

For a cross country tow up to 205 km/h (110 kts).

Winch launch (only allowed at the C.G. release)
Set the trim fully nose down for winch launch. To accomplish this, operate trimmer lever on the control column and push the control knob on the left cockpit wall to its forwardmost position.

Caution: During ground roll and initial take-off (especially when flying solo) push the control stick to its forwardmost position or fully nose-down to prevent excessive nose up pitching rotation during initial take-off.

After reaching safety altitude gradually pull back some on the stick, so that the glider will not pick up excessive speed. Don't pull too hard.

After reaching release altitude pull the tow release knob.

Recommended winch launch airspeed 100-120 km/h
(54-65 kts).

Caution: Do not fly at less than 90 km/h (49kts) or not more than 140 km/h (76 kts).

4.5.4 Free flight

Stalling characteristics (level and turning flight)

When stalled the DG-500 ELAN TRAINER will continue to fly level with high sink rate and buffeting.

If the stick is pulled further the DG-500 ELAN TRAINER will drop the nose or drop one wing.

During the stall a large angle of attack will be reached.

At forward C.G. positions the DG-500 ELAN TRAINER can be flown in stall without wing or nose dropping.

When reaching the minimum speed, the angle of attack has to be increased significantly, before the DG-500 ELAN TRAINER stalls, so that the stalled flight is easy to recognize.

With stick forward and opposite rudder if required the DG-500 ELAN TRAINER can be recovered without much loss of height. Rain does not influence this behaviour noticeably. The loss of height is ca. 30 m. Stall airspeeds see sect. 5.2.2.

4.5.7 Approach and landing

Abeam the landing point extend the landing gear (Option).

In calm weather approach with approx. 100 km/h (54 kts). With strong wind fly faster!

The very effective Schempp-Hirth dive brakes make a short landing possible. So a slip is not necessary as a landing technique.

Caution: While slipping, the rudder is sucked in its displaced position. So it is recommended to practice slipping at a higher altitude.

Strong crosswind offers no problem.

Do not approach too slowly with fully extended airbrakes otherwise the aircraft may drop during flare out.

When flaring out keep the airbrake setting you were using, opening them further may drop the sailplane.

Clean the landing gear and tow release after landing in an muddy field. Dirt in the front strut (Option retractable landing gear) can keep the landing gear from locking over center next time. Simply hosing with water is the best cleaning method.

Landing with the landing gear retracted
(Option retractable landing gear)

It is recommended to use this technique only on very short fields or if there are furrows in a cross direction in the field. After wheel up landing check the fuselage belly, the C.G. tow hook and the tow hook bulkheads for damage.

4.5.9 Flight at high altitude and at low temperatures

With temperatures below 0°C (32°F) for instance when wave flying or flying in winter, it is possible that the control circuits could become stiffer. Special care should be taken to ensure that there is no moisture on any section of the control circuits to minimize the possibility of freeze up.

It could be advantageous to apply vaseline along all the edges of the airbrake cover plates to minimize the possibility of freezing closed.

Apply the controls in short periods.

It is not allowed to carry waterballast.

Caution:

1. At temperatures below -20°C (-4°F) there is the risk of cracking the gelcoat.
2. Attention must be paid to the fact that at higher altitudes the true airspeed is greater than the indicated airspeed.

The max. speed VNE is reduced. See the following table:

Altitude in metres	0-2000	3000	4000	5000	6000
VNE IAS km/h	270	256	243	230	218

Altitude in ft.	0-6600	10000	13000	16000	20000
VNE IAS kts.	146	138	131	124	117

3. Do not fly below 0°C (32°F) when your glider is wet (e.g. after rain).

4.5.10 Flight in rain

With light rain the stall speed and the sink rate increases slightly and the approach speed has to be increased.

4.5.11 Cloud flying

Take care to fly smoothly and coordinated. It is prohibited to use a spin as a method for losing altitude in the clouds. In case of emergency, pull out the dive brakes fully before exceeding a speed of 200 km/h and dive with max. 200 km/h (108 kts) to leave the cloud.

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).

4.5.12 ff

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 controls strongly, preferable at one of the stops until the nose swings down and then flare out immediately.

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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)
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Half loop and half roll	220 km/h (119 kts)
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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 chosen 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.

4.5.12 ff

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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4.5.12 ff

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 position and the roll is finished as a "flicked"

The stall is indicated by buffetting of the tail-plane.

Section 5

5. Performance

5.1 Introduction

5.2 Approved Data

5.2.1 Airspeed indicator system calibration

5.2.2 Stall speeds

5.3. Additional Information

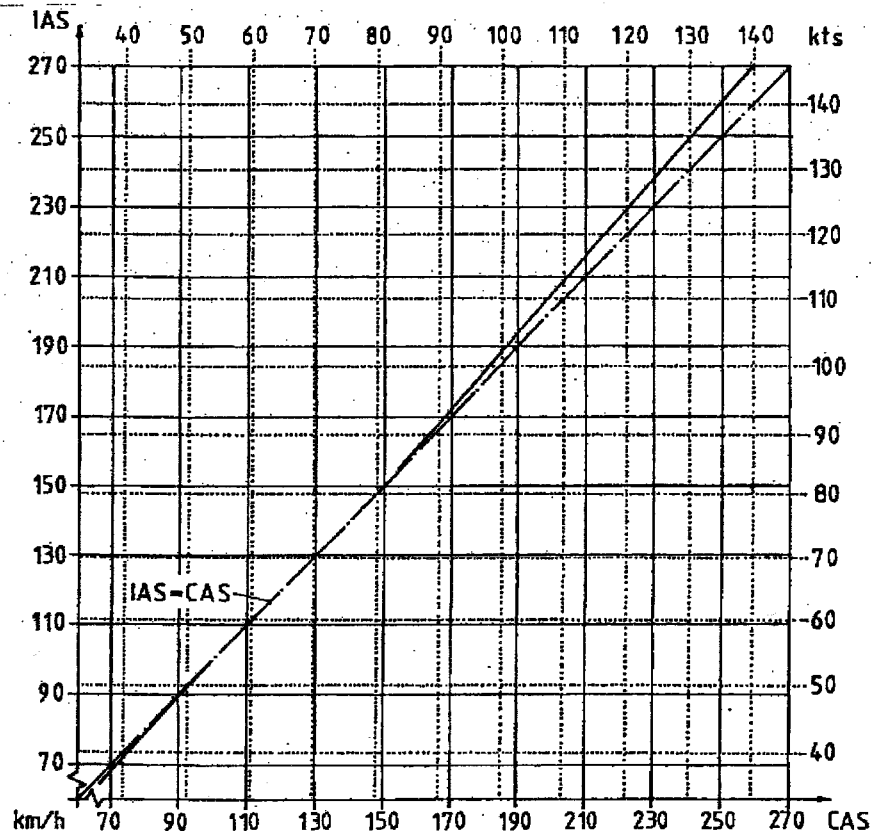
5.3.1 Demonstrated crosswind performance

5.3.2 Gliding performance

5.3.3 Flight Polar

5.2 Approved data

5.2.1 Airspeed indicator system calibration



IAS = indicated airspeed
CAS = calibrated airspeed

Caution: The airspeed indicator is to be connected to the static ports and pitot probe in the fuselage nose.

5.2.2 Stall speeds

Minimum airspeeds in level flight

Airbrakes retracted

Wing loading	28	33	37	kg/m ²
	5.7	6.8	7.6	lbs/ft ²
Stall speed	63	68	72	km/h
	34	37	39	kts

Airbrakes extended

Wing loading	28	33	37	kg/m ²
	5.7	6.8	7.6	lbs/ft ²
Stall speed	70	76	80	km/m ²
	38	41	43	kts

Flight mass		Wing loading	
kg	lbs	kg/m ²	lbs/ft ²
470	1036	28	5.7
500	1102	30	6.1
550	1213	33	6.8
600	1323	36	7.4
615	1356	37	7.6

The loss of height for stall recovery is approximately 30 m (100 ft) if recovered immediately.

5.3 Additional Information

5.3.1 Demonstrated crosswind performance

The demonstrated crosswind velocity is 15 km/h (8 kts) according to the airworthiness requirements.

5.3.2 Gliding performance

Performance data

Wing loading	kg/m ² (lbs/ft ²)	28 (5.7)	33 (6.8)	37 (7.6)
Min. sink rate	m/s (ft/min)	0.58 (100)	0.62 (108)	0.66 (116)
at V	km/h (kts)	73 (39)	79 (43)	84 (45)
Best glide ratio	-	39	39.5	40
at V	km/h (kts)	89 (48)	97 (52)	103 (56)

A variation in speed by ± 10 km/h (5 kts) from the above will decrease the best glide angle by 0.5 glide points and increase the min. sink rate by 1 cm/sec. (2 ft/min).

The polar curves can be seen on the next page.

For optimum performance, the aircraft should be flown with a C.G. towards the rear of the allowable range. This especially improves thermaling performance.

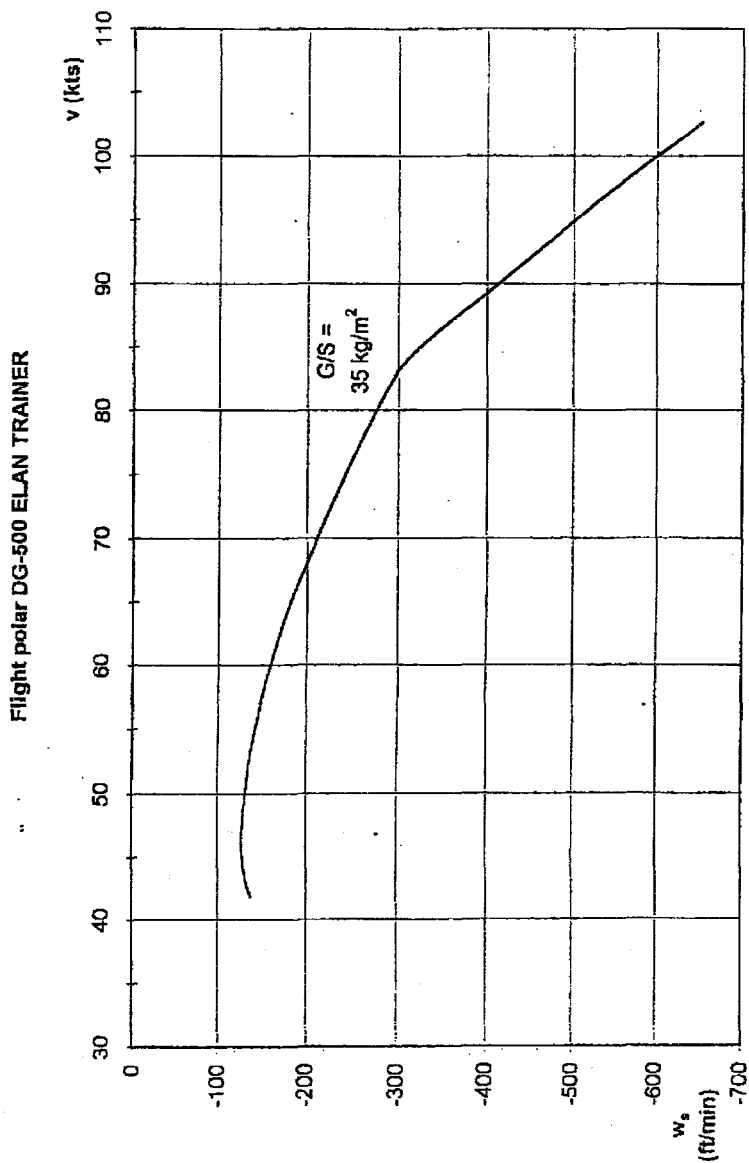
However the aircraft will be more pitch sensitive.

The wing fuselage joint, wing parting and the tailplane fin joint should be taped up and the aircraft thoroughly cleaned to obtain maximum performance.

The polars apply to a "clean" aircraft.

With dirty wings or flight in rain, the performance drops accordingly.

5.3.3 Flight polar



Section 6

- 6. Mass (weight) and balance
 - 6.1 Introduction
 - 6.2 Weighing procedures
 - 6.3 Weighing record
 - 6.4 Basic empty mass and C.G.
 - 6.5 Mass of all non-lifting parts
 - 6.6 Max. mass
 - 6.7 Useful loads
 - 6.8 Loading chart
 - 6.9 C.G. calculation

6.1 Introduction

This section contains the payload range within the sailplane may be safely operated.

A procedure for calculating the inflight C.G. is also provided.

A comprehensive list of all equipment available for this sailplane is contained in the maintenance manual.

6.2 Weighing procedures

See maintenance manual DG-500 ELAN TRAINER.

Datum: Wing leading edge at the rootrib.

Reference line: aft fuselage centre line horizontal.

The weighing is to be executed with the engine retracted and all tanks emptied.

6.3 Weighing record

The result of each C.G. weighing is to be entered on page 6.5. If the min. cockpit load has changed this data is to be entered in the cockpit placard as well.

When altering the equipment, the new data can be gathered by a C.G. calculation. (see sect. 6.9).

The actual equipment list is enclosed in the maintenance manual.

6.4 Basic empty mass and C.G.

Actual data see page 6.5.

With the empty weight C.G. and the cockpit loads in the limits of the diagram on page 6.6, the inflight C.G. limits will not be exceeded.

6.5 Mass of all non-lifting parts (WNLP)

The max. mass of all non-lifting parts is 435 kg (959 lbs).

WNLP is to be determined as follows:

WNLP = WNLP empty + cockpit load (pilot, parachute, baggage, barograph, cameras etc.).

WNLP empty = Total empty weight minus weight of the wings.

6.6 Max. mass (weight)

Max. weight without waterballast = WNLP + W wings

Max. weight = 615 kg (1356 lbs)

6.7 Useful loads

Max. load = max. weight - empty weight

The data is recorded on page 6.5.

6.8 Loading chart

Cockpit load see table on page 6.5.

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.

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.

With lower pilot weight necessary ballast must be added in the seat. Ballast put on the seat (lead ballast cushion) must be fastened at the connections of the safety belts.

Removable Ballast (Option) see sect. 7.16.1.

Baggage: max. 15 kg (33 lbs)

Heavy pieces of baggage must be secured to the baggage compartment floor (screwing to the floor or with belts). The max. mass secured on one half of the floor (left and right of fuselage centre line) should not exceed 7,5 kg (16.5 lbs).

Battery in the fin:

Only the use of the factory supplied battery Z 07, (12 V, 10 Ah, Mass 4.3 kg, 9.5 lbs) is permitted.

Warning: Flying is only allowed with the battery in the fin as otherwise the forward C.G. limit may be exceeded.

Flight manual DG-500 ELAN TRAINER

Weighing report (for 6.3)

Distances in mm, masses in kg

25.4 mm = 1 inch

1 kg = 2.2046 lbs.

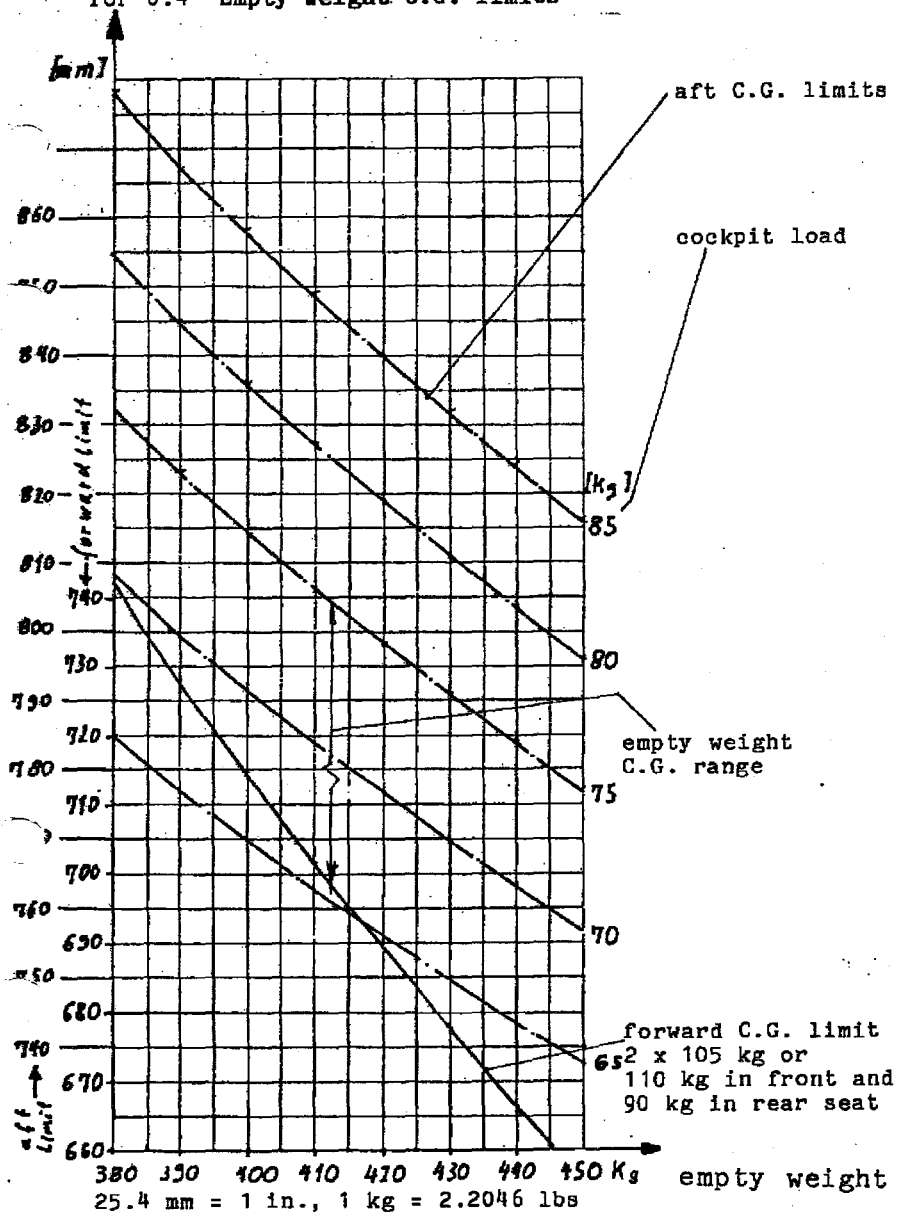
Date of weighing:					
Executed by:					
Date of equipment list:					
Tail wheel (see remarks)	Plastic/brass	Plastic/brass	Plastic/brass	Plastic/brass	Plastic/brass
Empty mass					
Empty mass C.G.					
Max. mass					
Max. load					
Min. cockpit load in front seat					
Max. load in both seats					
Inspector Signature, Stamp					

Remarks: 1. The weighing is to be executed with the battery (Z 07, mass 4.3 kg - 9.5 lbs) installed in the fin.

2. Weighing was done with a plastic/brass-hub (s. 7.16.4).
(Delete which is inapplicable)

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for 6.4 Empty weight C.G. limits



6.9 C.G. calculation

The actual C.G. can be determined as follows:

For each item, the moment mass x C.G. has to be determined and to be added up and divided by the total mass. See the following example:

1 kg = 2.2046 lbs = .264 US gal. water 0.305 m = 1 ft
 Item mass C.G. behind moment
 datum

	kg	m	m kg
aircraft empty	380	0,74	281,2
Pilot front	75	- 1,35	- 101,25
rear	85	- 0,27	- 22,95
Sum	540	XS=0,291	157,0

CG=moment/mass

The limits of the inflight C.G. 0.185 m - 0.48 m should not be exceeded!

The most important C.G. positions (behind datum):

Pilot:

The C.G. position is dependent on the pilots shape, mass and thickness of the parachute. The pilot C.G. position can be determined by executing a weight and balance measurement with glider empty and equipped with the pilot etc. see maintenance manual. Please note, that the distance has to be measured with both configurations, as it may change due to deflection of the landing gear.

The pilot C.G. can be determined by the following equation:

$$XP = (XSF \cdot MF - XSE \cdot ME) / MP$$

MF = flight mass XSF = flight C.G. MP = pilot mass
 ME = empty mass XSE = empty C.G.

If the actual pilot C.G. is not known, you have to take the values from the following table:

Flight: f = near the forward C.G.
r = near the aft C.G.

Pilot C.G. [m]

Pilot mass [kg]	Front cockpit		Rear cockpit	
	f	r	f	R
110	-1,348	-1,295	-0,277	-0,232
105	-1,350	-1,296	-0,278	-0,233
100	-1,351	-1,297	-0,279	-0,234
95	-1,352	-1,298	-0,280	-0,235
90	-1,353	-1,300	-0,281	-0,236
85	-1,355	-1,301	-0,283	-0,237
80	-1,356	-1,302	-0,284	-0,238
75	-1,357	-1,303	-0,285	-0,239
70	-1,359	-1,304	-0,286	-0,240
65	-1,360	-1,305	-0,288	-0,241
60	-1,361	-1,306	-0,289	-0,242
55	-1,362	-1,307	-0,290	-0,243

Further C.G. positions:

Baggage or battery in baggage compartment:	0,31 m
Instruments in front panel:	-1,870 m
Instruments in rear panel:	-0,7 m
Removeable ballast (Option see 7.16.1a):	-2,455 m
Removeable ballast (Option see 7.16.1b):	-1,920 m
Battery in fin (s.sect. 6.8)	5,306 m
Tailwheel	5,345 m

Section 7

- 7. Sailplane and systems description
 - 7.1 Introduction
 - 7.2 Airframe
 - 7.3 Cockpit, cockpit controls and placards
 - 7.4 Flight controls
 - 7.5 Airbrake system
 - 7.6 Landing gear system
 - 7.7 Tow hooks
 - 7.8 Seats and safety harness
 - 7.9 Baggage compartment
 - 7.10 Section not effective
 - 7.11 Section not effective
 - 7.12 Section not effective
 - 7.13 Electrical system
 - 7.14 Pitot and static system
 - 7.15 Canopy emergency release
 - 7.16 Miscellaneous equipment (Options)
 - 7.16.1 Removable ballast
 - 7.16.2 Oxygen system
 - 7.16.3 ELT
 - 7.16.4 Heavy Tailwheel

7.1 Introduction

This section provides description and operating of the sailplane and its systems.

Refer to section 9 "Supplements" for details of optional systems and equipment.

M.M. = Maintenance manual

7.2 Airframe

The DG-500 ELAN TRAINER is a two-seater high performance sailplane.

Construction

Wings,	CFRP-foam-sandwich-shell
Ailerons	CFRP-Rovingspar caps AFRP-foam-sandwich-shell
Horizontal tailplane and rudder	GFRP-foam-sandwich-shell
Fuselage	GFRP-shell, fuselage boom with Tubus core

Canopy

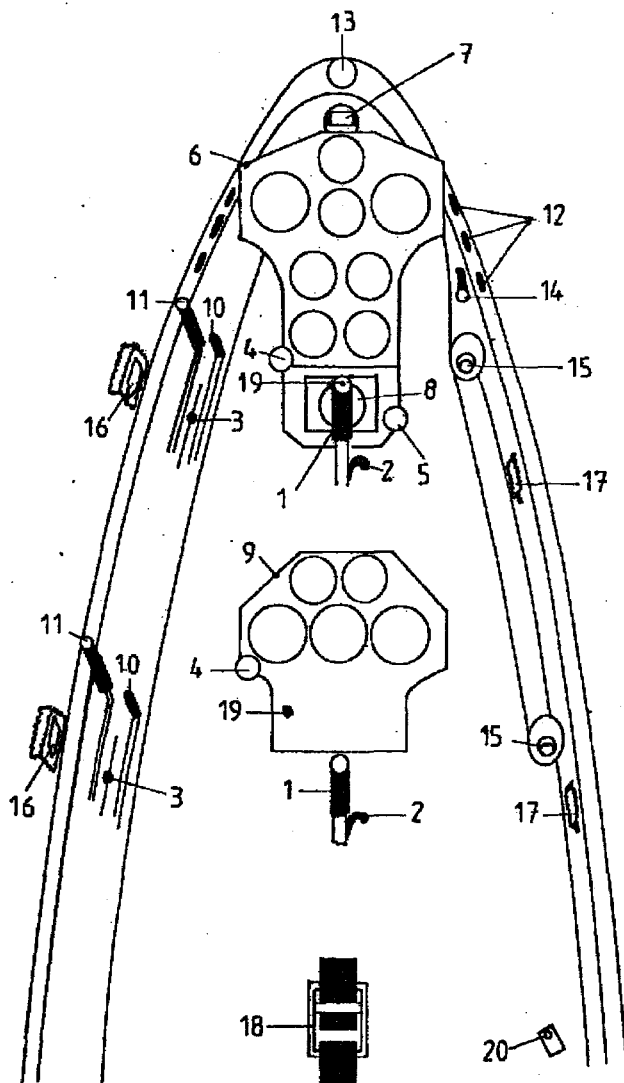
Two canopies hinged at the right fuselage side.
Canopy glass made from clear Plexiglas or Plexiglas GS green 2422 as option.

Tailplane

T-Tail with conventional stabilizer-elevator and spring trim.

Color	Airframe:	white	
	registration numbers:	grey	RAL 7001
		or red	RAL 3000
		or blue	RAL 5012

7.3 Cockpit, cockpit controls and placards

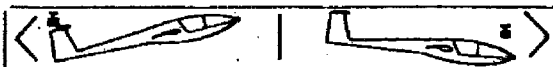


1) Control Column

The rear control stick is removable. Therefore open the snap shackle at the trim release lever and disengage the trim cable. Pull out the stick after opening the cap nut.

2) Release lever for the trim mechanism - green.
Operation see sect. 7.4 elevator control.

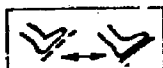
3) Trim position indicator and trim preselection lever



4) Tow release knob - yellow.



5) Rudder pedal adjustment knob - black
(only in front cockpit)



By pulling on the knob, the locking pin will be disengaged and the rudder pedals can be pulled back towards the pilot or pushed forward away from the pilot.

6) Front Instrument Panel

After removing the side screws at the base 2 x M 6 and after removing the screws attaching the cover to the panel 6 x M 4, the cover can be removed towards the front. The panel remains in the aircraft.

7) Compass installation position.

8) Radio installation position.

9) Rear Instrument Panel

After removing the side screws attaching the panel to the cover (4 x M 4) the panel can be hinged backwards into the cockpit (take out the control stick first!).

10) Undercarriage retraction - extension handle (Option) - black
forward - undercarriage down
back - undercarriage retracted

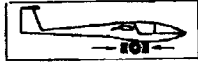
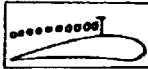


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The undercarriage is locked in the extended position by an overcentre locking arrangement and an additional safety catch. The handle is to be turned towards the cockpit wall, so that the locking catch will engage.

11) Airbrake handle - blue

The wheel brake is operated at the end of the airbrake handle travel.



~~Optional parking brake combined with an airbrake securing device (Piggott-hook): Pull the airbrake handle back to actuate the wheelbrake and rotate the handle to the cockpit wall. A detent will engage in one of 4 notches to hold the system in this position.~~

~~In case the airbrakes mistakenly haven't been locked, a detent engages in one of several notches to avoid inadvertent deployment of the airbrakes. To open and to close the airbrakes the operating handle must be rotated into the cockpit so far that the detent passes the notches.~~

12) Constantly open de-misting air vents

13) Main air vent

14) Main air vent operating knob

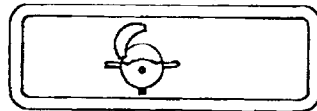
pushed to front = closed
pulled = open



15) Swivel air vents

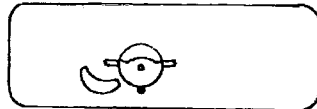
16) Canopy opening handle - white-red

towards the nose = closed
into cockpit = open



17) Canopy emergency release handle - red

towards the nose = closed
into cockpit = open



Emergency release procedure see sect. 3.2.

- 18) Adjustment strap for the rear seat shell (to be operated on the ground)
- 19) Push to talk button (Option)
- 20) 12 V socket for charging the batteries.

7.4 Flight controls

Rudder control:

Cable system with adjustable pedals in the front cockpit. See diagram 2 M.M.

Elevator control:

All pushrods slide in maintenance free nylon ball guides.

Automatic control hook up system.

Spring trimmer with release lever at the control stick and control knob at the left cockpit wall.

See diagram 1 M.M.

To trim, you have to operate the release lever at the control stick and place the control knob to the desired position.

Aileron control:

Pushrods slide in maintenance free nylon ball guides.

Automatic control hook up system.

See diagram 3 and 4 M.M.

7.5 Airbrakes see diagram 3 and 4 M.M.

Double storey Schempp-Hirth type airbrakes on the upper wing surface.

The wheel brake is operated by the airbrake system.

Pushrods in the wings slide in maintenance free nylon ball guides.

Automatic control hook up system.

7.6 Landing gear see diagram 2 M.M.

a1) Main wheel: non retractable, spring mounted with steel compression springs, fully sealed landing gear box, drum brake, tyre 380 x 150 GPR
diameter 380 mm (15.0 in.)
tyre pressure 2.5 bar (36 psi)

a2) Main wheel: retractable, assisted by a gas strut, spring mounted with steel compression springs, locked in retracted position by an overcentre locking device, fully sealed landing gear box, hydraulic disc brake.
tyre 380 x 150 6 PR
diameter 380 mm (15.0 in.)
tyre pressure 2.5 bar (36 psi)

- b) Tailwheel: Tyre 200 x 50 2 PR
Diameter 200 mm (7.87 in)
Tyre pressure 4 bar (58 psi)
- c) Nosewheel: Tyre 260 x 85
Diameter 260 mm (10.2 in.)
Tyre pressure 2.5 bar (36 psi)

Option: See diagram 10 M.M.

The nose wheel is connected to the rudder control with springs.

7.5 Tow hooks

See diagram 5 M.M.

Safety release "Europa G 88" for winch launch installed near the C.G.

"nose release E 85" installed in the fuselage nose for aerotow.

Both hooks are operated by the same handle.

7.8 Seats and safety harness

The front seat is constructed as an integral inner shell.

The rear seat is height adjustable. The adjustment is by means of a strap similar to the shoulder harness.

As safety harness only symmetric 4-point harnesses fixed at the given fixing points are allowed.

7.9 Baggage compartment

Max. load 15 kg (33 lbs.).

Heavy pieces of baggage must to be secured to the floor.

7.13 Electrical System

Battery in the fin

For C.G. reasons the battery is installed in the fin. Only the use of the factory supplied battery Z 07 (12 V, 10 Ah, mass 4.3 kg, 9.5 lbs) is permitted.

The battery fuse is installed at the battery, type: G fuse 250 V with indicator 5 x 25 medium slow / 4 A.

After inserting the connector plug in the fin the battery is connected to the electrical system of the glider. If the battery shall be charged inside the glider this can be done via socket 22, see section 7.3.

To charge the battery to its full capacity an automatic charger with 14.4 V max. charging voltage is necessary (normal automatic chargers charge only up to 13.8 V).

Such a charger is available through Glaser-Dirks code no. Z 08.

All current - carrying wiring conforms to LN aeronautical specifications.

7.14 Pitot and static system see diagram 8 M.M.

Pitot probe in fuselage nose, and static ports a short distance behind fuselage nose.

The airspeed indicator and the altimeter are to be connected to these ports and probe.

Additional holder for a Multiprobe in the fin is to operate variometer and flight computersystems.

To preserve the sealings inside the holder the end of the probe should be greased with vaseline from time to time.

7.15 Canopy emergency release

To bail out the red canopy emergency release handle (right) and the white-red canopy opening handle (left) have to be operated simultaneously. Push canopy upwards. The retaining lines will tear off.

Reinstalling the canopy.

Open emergency release and canopy locking lever. Place canopy in vertical direction onto the fuselage. Close emergency release. Open canopy and snap in retaining cable.

7.16 Miscellaneous equipment (Options)

7.16.1 Removable ballast

a) Up to 4 ballast weights (code no. Z 10) of 2.16 kg (4.76 lbs) each can be fixed at the M 8 insert in front of the front rudder pedal mounting point. Each weight compensates a pilot mass of 3.7 kg. (8.16 lbs) in the front seat. The ballast weights must be fixed with an M 8 bolt which is min. 10 mm (.4 in.) longer than the thickness of all ballast weights.

b) For serial no. 5E140 and up:
The ballast box (option) at the right hand side of the instrument console underneath the carpet can accommodate 3 lead ballast weights of min 2.2 kg (4.85 lbs) each. Each weight compensates a pilot mass of 2.9 kg (6.4 lbs). With 3 weights 8.7 kg (19.2 lbs) missing pilot mass can be compensated. The lead ballast weights are to be fixed in the box with a M 8 wingnut.

7.16.2 Oxygen system

a) Oxygen bottle installation

Max. size of oxygen bottle is 7 l capacity with diameter 140 mm (5.5 in.)- If a bottle with less diameter is used, this bottle must be wrapped with plastic to come to the same diameter of 140 mm. The bottle must be fixed at its neck with a bracket Z 14 (available at DG-Flugzeugbau GmbH).

b) Installation of the oxygen equipment

To ensure a safe installation ask DG-Flugzeugbau GmbH for an installation instruction.
For the installation of the Dräger Höhenatmer E 20088 you will find an installation plan 5 EP 34 in the maintenance Manual.

7.16.3 ELT Emergency Locator Transmitter

To ensure a safe installation ask DG-Flugzeugbau GmbH for an installation instruction.
For the Pointer Inc. ELT Model 3000 you will find an installation plan 5 EP 30 in the maintenance manual.

Caution: Concerning 7.16.2 and 7.16.3

The installation of such equipment has to be accomplished by the aircraft manufacturer or by an approved service station and to be inspected and entered in the aircraft log book by a licensed inspector.

7.16.4 Heavy tailwheel

Instead of the standard tailwheel with plastic hub a tailwheel with brass hub S 27/1 may be installed. The installation kit S 27/4 is available at DG-FLUGZEUGBAU GmbH.

The difference in mass between both hubs is 3.1 kg (6.84 lbs). With the brass hub, the min. front cockpit load is increased by 8.5 kg (18.74 lbs). This higher value must be entered in the cockpit data placards and on page 6.5. Even if the heavy tailwheel is installed only sometimes, the higher min. cockpit load must be entered.

Section 8

- 8. Sailplane handling, care and maintenance
 - 8.1 Introduction
 - 8.2 Inspection periods and maintenance
 - 8.3 Alterations or repairs
 - 8.4 Parking
 - 8.5 Trailering
 - 8.6 Towing on the ground
 - 8.7 Cleaning and care

Flight manual DG-500 ELAN TRAINER

8.1 Introduction

This section contains manufacturer's recommended procedures for proper ground handling and servicing of the sailplane. It also identifies certain inspection and maintenance requirements which must be followed if the sailplane is to retain that new-plane performance and dependability. It is wise to follow a planned schedule of lubrication and preventive maintenance based on climatic and flying conditions encountered.

8.2 Inspection period, maintenance

The "Instructions for continued airworthiness (maintenance manual) for the DG-500 ELAN TRAINER have to be followed.

- A Before each rigging all the connecting pins and bushes should be cleaned and greased. This includes the control connectors.
- B The contact surfaces of the canopies to the fuselage are to be rubbed with colourless floor-polish (canopy and fuselage side) to reduce grating noise in flight. Polish at the beginning of the flight season and then every month.
- C Once a year all the bearings and hinges should be cleaned and greased. See the greasing programme of the maintenance manual.
Each year the control surface displacements, adjustments and general condition must be checked. (See the maintenance manual).

8.3 Alterations or repairs

It is essential that the responsible airworthiness authority be contacted prior to any alterations on the airplane, to ensure that the airworthiness of the sailplane is not impaired. It is prohibited to execute the alteration without the approval of the airworthiness authority. The manufacturer will not be liable for the alteration or for damages resulting from changes in the characteristics of the aircraft due to alteration. So it is strongly recommended to execute no alternatives which are not approved by the aircraft manufacturer.

External loads such as external camera installations are to be regarded as alterations! Repair instructions can be found in the DG-500 ELAN TRAINER repair manual. No repairs should be carried out without referring to the manual.

8.4 Tie Down, Parking

To tie down the wings use the wing cradles of your trailer. The fuselage should be tied down just ahead of the fin. On sunny days the cockpit should be closed and covered.

Note: Longer parking with exposure to sun and humidity will cause premature aging of the skin of your sailplane.

8.5 Trailering

It is recommended to carry this valuable sailplane in a factory approved closed trailer.

Approved fitting points:

Wing panels:

1. Wing spar as close to wing rootrib as possible or a rootrib wing cradle.
2. A wing cradle at the taper change.

Stabilizer:

Cradles as desired.

Fuselage:

1. A felt lined fiberglass nose cap which does not extend over the canopy, secured to floor.
2. Fuselage dolly in front of the tow hook.
3. Tail wheel well in trailer floor. Secure fuselage with a belt in front of the fin or hold it down with the trailer top (soft foam in top).

All aircraft structures should not be subject to any unusual loads. With high temperatures that can occur inside trailers, these loads in time can warp any fibre reinforced plastic sailplane.

The trailer should be well ventilated so as to prevent moisture build up which could result in bubbles forming in the gelcoat.

A solar powered ventilator is recommended.

8.6 Towing on the ground

- a) by towing from the nose hook using a rope with the standard double ring authorized for the release.
- b) by using a tow bar which is fixed at the tail dolly and a wing tip wheel.

The tow bar and wing tip wheel may be ordered through the Glaser-Dirks factory.

8.7 Cleaning and Care

Exterior surfaces of the fibrereinforced plastic parts

The surfaces are coated by a UP-gelcoat. This gelcoat is protected by a hard wax coating which has been applied during production with a rotating disc ("schwabbel" procedure). Do not remove the wax, because this would lead to shading, swelling and cracking of the surface. In general, the wax coat is very resistant. As soon as the wax coat is damaged or worn, a new coat has to be applied (see maintenance manual sect. 3.1). If you store your aircraft often outside, this may be necessary every half year!

Hints for care:

- Wash the surface only with clear water using a sponge and chamois.
- The adhesive remains of tape may be removed with petroleum ether (pure petroleum spirit) which should be applied and removed immediately, otherwise this may lead to swelling of the gelcoat.
- More stubborn dirt which cannot be removed by washing may be cleaned off with siliconefree, wax containing car polishes (e.g. 1Z Extra, Meguiars in USA)
- Longterm dirt and shading can be removed by applying a new hard wax coat (see maintenance manual sect. 3.1).

8.7 ff

- Never use alcohol, acetone, thinner etc.. Do not use detergents for washing!
- Protect the surface from intense sunlight.
- Protect the aircraft from water and moisture. See sect. 8.4 and 8.5.
- Remove water that has entered and allow the aircraft to dry out.
- Never store your wet aircraft in a trailer.

Flexiglas canopy:

- Use clear water and a chamois for cleaning.
- Stubborn dirt and small scratches can be removed by use of the "schwabbel procedure" (see maintenance manual sect. 3.1).

Metal parts:

The pins and bushes for rigging the aircraft are not surface protected and must be covered with grease all the time.

The other metal parts, especially the control stick and all handles should be preserved with metal polishes occasionally.

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Section 9

9. Supplements

Section not effective