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	0.3-0.5, 2.6,4.10, 4.15,4.17	TN 843/2	Febr.92	March 04, 92	
2	0.1,0.3, 0.4,0.5, 3.4, 6.6, 6.7, 7.2, 7.7, 7.8, 8.7	TN 843/5	Sept.92	Dec.08, 92	
3	0.1,0.3, 0.4,0.5, 2.6, 2.8, 2.10, 4.12, 4.13, 5.9, 6.5, 6.9, 7.17, 7.18, 8.2, 8.6	TN 843/7	Febr.96	April 08, 96	
4	0.1,0.3,2.6	TN 843/8	March 97	05.06.97	
5	0.1, 0.5, 7.11	TN 843/11	Dec. 98	Dec. 17, 98	
6	0.1, 0.3, 0.5, 4.8, 7.14, 8.2	TN 843/16	Jan. 01	07.02.01	
Rev. No.	Affected pages / section	Description	Issue Date	EASA Approval Date	Inserted Date Signature
7	0.3-0.5, 2.8, 3.1, 3.2, 3.4-3.7, 4.1, 4.8, 4.25, 7.1, 7.16	TN 843/28 manual revision	May 2008	August 1. 2008	
8	0.5, 9.1, 9.2	Special equipment for very small pilots TN500/02	May 2010	20.07. 2010	
9	0.1, 0.3 - 0.5, 2.10, 4.8- 4.10, 4.24, 4.25, 7.2, 7.11, 8.3	Manual revision, TN500/11	July 2017	10.08. 2017	

0.2 List of effective pages

Section	page	issued	Replaced/	replaced/	replaced	replaced
0	0.0	April 89				
	0.1 -	See record of revisions				
	0.2	"				
	0.3	"				
	0.4	"				
	0.5	"				
	0.6	April 89				
1	1.1	April 89				
	1.2	Febr. 91				
	1.3	April 89				
	1.4	"				
	1.5	"				
	1.6	"				
2 App.	2.1	"				
"	2.2	"				
"	2.3	"				
"	2.4	"				
"	2.5	"				
"	2.6	"	Febr.92/	Febr.96/	March 97	
"	2.7	"				
"	2.8	"	Febr.96	May 08		
"	2.9	"				
"	2.10	"	Febr.96	July 2017		
"	2.11	"				
3 "	3.1	"	May 08			
"	3.2	"	May 08			
"	3.3	"				
"	3.4	"	Sept.92	May 08		
"	3.5	"	May 08			
"	3.6	"	May 08			
"	3.7	May 08				
4 "	4.1	April 89	May 08			
"	4.2	"				
"	4.3	"				
"	4.4	"				
"	4.5	"				
"	4.6	"				
"	4.7	"				
"	4.8	"	May 08	July 2017		
App.	4.9	"	July 2017			

0.2 List of effective pages (cont.)

Section		Page	issued	replaced	replaced	replaced	replaced
4	App.	4.10	"	Febr.92	July 2017		
	"	4.11	April 89				
	"	4.12	April 89	Febr. 96			
	"	4.13	"	" "			
	"	4.14	"				
	"	4.15	"	Febr. 92			
	"	4.16	"				
	"	4.17	"	Febr. 92			
	"	4.18	"				
	"	4.19	"				
	"	4.20	"				
	"	4.21	"				
	"	4.22	"				
	"	4.23	"				
	"	4.24	"	July 2017			
	"	4.25	"	May 08	July 2017		
	"	4.26	"				
5	"	5.1	"				
	"	5.2	"				
	"	5.3	"				
	"	5.4	"				
	App.	5.5	"				
		5.6	"				
		5.7	"				
		5.8	"				
		5.9	"	Febr. 96			
		5.10	"				
6		6.1	"				
		6.2	"				
		6.3	"				
		6.4	"				
		6.5	"	Febr. 96			
		6.6	"	Sept. 92			
		6.7	"	Sept. 92			
		6.8	"				
		6.9	"	Febr. 96			

0.2 List of effective pages (cont.)

Section	page	issued	replaced	replaced	replaced	replaced
7	7.1	April 89	May 08			
	7.2	"	Sept. 92	July 2017		
	7.3	"				
	7.4	"				
	7.5	"				
	7.6	"				
	7.7	"	Sept. 92			
	7.8	"	" "			
	7.9	"				
	7.10	"				
	7.11	"	Aug. 90	Dec. 98	July 2017	
	7.12	"				
	7.13	"				
	7.14	"				
	7.15	"				
	7.16	"	May 08			
	7.17	"	Febr. 96			
	7.18	"	"			
8	8.1	"				
	8.2	"	Febr. 96	Jan. 01		
	8.3	"	July 2017			
	8.4	"				
	8.5	"				
	8.6	"	Febr. 96			
	8.7	"	Sept. 92			
9	9.1	April 89	May 10			
	9.2	May 10				

2.14 Aerotow, winch and autotow launching

2.14.1 Weak links

10 000 N ± 10%
2 200 lbs ± 10%

2.14.2 Length of the towing cable

for aerotow 30-70 m (100 - 230 ft) Material: hemp- or plastic fibres

2.14.3 Max. towing speeds

Aerotow	VT = 197 km/h, 106 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 demonstrated crosswind velocity is 15 km/h (8 kts) according to the airworthiness requirements.

2.16 Tyre Pressure

Main wheel	3.0 bar 44 psi
Nose wheel	2.5 bar 36 psi
Tail wheel	4.0 bar 58 psi

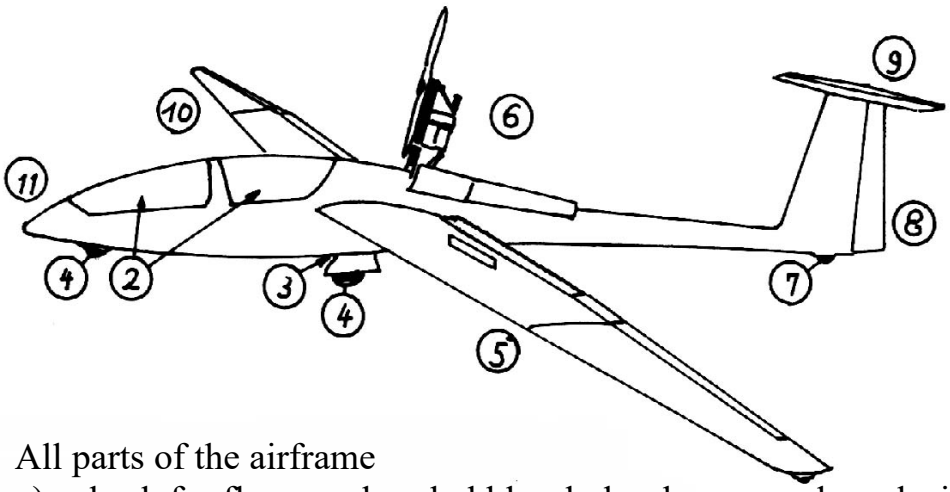
2.17 Waterballast

Max. capacity 50 l (13.2 U.S. gal.) per wing. Filling the water ballast is only allowed with a filling system which enables determination of the exact amount of ballast filled, e.g. water gauge or calibrated canisters. Only symmetrical loading is allowed.
After filling, balance the wings by dumping enough water from the heavy wing. Flight with leaking watertanks is prohibited, as this may result in asymmetrical loading condition.
Warning: Follow the loading chart, see sect. 6.8. The max. take off weight must no be exceeded.

2.18 Wing fuel tanks (Option)

Max. capacity 20 l (5.3 U.S.gal.) per wing
Don't park the rigged glider with filled wing fuel tanks for extended periods!

B Inspection after rigging
Walk around the aircraft



1. All parts of the airframe
   a) check for flaws such as bubbles, holes, bumps and cracks in the surface
   b) check leading and trailing edges of the wings and control surfaces for cracks
2. Cockpit area
   a) check the canopy locking mechanism
   b) check the canopy emergency release see sect. 7.15 (not each day, but min. every 3 month)
   c) check the main pin securing
      check the securing ropes of the headrest in the rear cockpit for wear and function and length: is it possible that the headrest interferes with the control stick?
   d) check all controls for wear and function, incl. positive control check, check if the handle of the pedal adjustment cable will be pulled to the front so that it can't hook into the trim release lever at the control stick, even with pedals in a rear position;
   e) check the tow release system for wear and function incl. cable release check
   f) check for foreign objects
   g) check the instrumentation and radio for wear and function
   h) check the brake fluid level
   i) check the fuel filter for dirt and sludge
   j) check the engine controls
   k) check all fuses including the battery fuse
   l) check the extension-retraction mechanism by operating it in both directions. The extension time should not exceed 13 seconds!
      Note: If the mechanism can't be operated with the ignition switch or with the manual switch, check the circuit breaker.
   m) extend the engine with the manual switch

4.3 **B ff**

3. C.G. Tow hook
   a) check the ring muzzle of the C.G. hook for wear and function
   b) check for cleanliness and corrosion
4. Main landing gear and nose wheel
   a) check the struts, the gear box, the gear doors and the tyre for wear; dirt in the struts can hinder the landing gear from locking over center the next time!
   b) check the tyre pressure
      mainwheel: 3.0 bar - 44 psi
      nose wheel: 2.5 bar - 36 psi
   c) check wheel brake and cable for wear and function
5. Left wing
   a) check locking of the outboard wing
   b) check the aileron for excessive free play
   c) check the wing flaps for excessive free play
   d) check airbrake- and box and control rod for wear and free play. It must be possible to retract the airbrake, even if it is pressed in backward direction. If there is any water in the airbrake box this has to be removed.
   e) check the locking of the rear wing attachment pin
6. Power plant checks
   Extend the powerplant via the manual switch (ignition off).
   a) all screwed connections and their securing
   b) function of throttle and propellerbrake
   c) ignition system incl. wires and the spark plug connectors for tight fit
   d) toothed belt for wear and correct tension, sudden loss of tension indicates damage of the engine assembly see item h)
   e) engine restraining cables and their connections in the engine compartment
   f) fuel lines, electrical wires, bowden cables and structural parts for wear and kinks
   g) exhaust muffler, intake muffler, engine mount and accessories for tight fit and any cracking, intake opening screens of intake muffler for dirt.
   h) apply strong forward pressure to the propeller mount, to check if the bolted connection between the propeller mount and the engine block are loose or damaged.
      Check the mounting points of the two GFRP struts for free play. No free play is allowed.

4.3 **B ff**

i) check cooling liquid level, refill if necessary
Warning: The hose clamp which secures the cap of the cooling liquid reservoir must be mounted so that the screwed joint is in the front to prevent the engine retaining cables catching the screwed joint.
j) check the oil level for rotary valve drive
k) check the cooling system and the oiling system for leaks,
check the coolant hoses visually for leaks and any defects of the outer surface.
l) visual check of the propeller
m) turn the propeller 1 revolution by hand listen for abnormal sounds which may indicate engine damage
n) fuel level
o) drain condensed water from the fuel tank. The drainer is located in the main wheel box on the rear wall on the right hand side.

7. Tail wheel
   a) check for wear, free play and excessive dirt in the wheel box. Remove excessive dirt prior to take off!
   b) check tyre pressure: 4 bar -58 psi
8. Rear end of the fuselage
   a) check the lower rudder hinge and the connection of the rudder cables for wear, free play and correct securing
   b) check the bulkhead and fin trailing edge shear web for cracks and delamination
9. Fin - horizontal tail
   a) check the upper rudder hinge for wear and free play
   b) check the elevator for free play and correct control hook up, look from the rear into the gap at the right hand side of the rudder
   c) check the securing of the stabilizer
   d) check the horizontal tail for free play
   e) check the TE or Multiprobe for correct insertion
10. Right wing see detail 5.
11. Fuselage nose
   a) check the ports for the static pressure and the pitot pressure for cleanliness.
   b) if the sailplane was parked in rain, you have to empty the static ports by sucking out the water at the ports.
   c) check the nose hook for cleanliness and corrosion

4.5.8 Flight with water ballast

Wing tanks

recommended ballast for smooth thermals:

rate of climb		ballast	
m/s	fpm	ltr.	U.S. gallons
below 1,5	300	none	
1,5-3	300-600	60	16
more than 3	600	max. ballast	

Do not exceed the maximum gross weight when loading the water ballast. The maximum quantity of water allowed is dependent on the empty weight and the cockpit load (see sect.6). In flight, the water drains at approx.0,5 ltr./sec. (1.1 lbs/sec).

If there is the risk of freezing, dump all water before you reach freezing altitude or descend to lower altitudes. If you suspect a tank is leaking, dump all water immediately. Water ballast raises the approach speed, so it is recommended to dump the waterballast before landing. Dump the ballast before an outlanding in any case.

Filling the waterballast see sect. 4.2

After filling level the wings and check if the dump valves are tight. It is not allowed to fly with leaking watertanks as this may result in an asymmetric loading condition.

Dumping of the waterballast

Open both wing ballast tanks together. Do not empty one wing tank after the other to avoid an asymmetric loading condition.

Valves leaking, servicing

Please refer to the maintenance manual sect. 1.8 and 4.1.

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 circiuts 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 grater 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. Dump the water ballast before you reach freezing altitude or descend to lower altitudes.
4. Do not fly below 0°C (32°F) when your glider is wet (e.g. after rain).
5. The antifreeze in the coolant of the engine is mixes normally for a lowest OAT of -20°C. For high altitude flights where lower temperatures may be expected you have to change the mixture for -40°C, see MM section 1.11.2.

4.5.10 **Flight in rain and thunderstorms**

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

Warning: Flights and especially winch launches in the vicinity of thunder storms should be avoided. Due to lightning discharge, carbon fibre structures may be destroyed.

With the engine running

In normal rain, the rate of climb will be reduced by 1/3. The cross country cruising speed will also be reduced by approx. 10 km/h (5 kts). Take off in rain should only be done with a long enough airfield and attention given to safety. A take off should not be attempted in heavy rain. Rain increases the wear on the leading edge of the propeller so that any flight in rain should be kept to the absolute minimum.

4.5.11 **Cloud flying**

(only without waterballast and with the engine retracted)

Take care to fly smoothly and coordinated. It is prohibited to use a spin as a method for loosing 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.

Warning: Flying in or near thunderstorm-clouds is prohibited.

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-500M is a two-seater high performance sailplane with retractable powerplant and wing flaps.

Construction

Wings, ailerons and wingflaps	CFRP-foam-sandwich-shell CFRP-Rovingspar caps
Elevator	GFRP-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.

Colours

Airframe:	white		
registration numbers:	grey	RAL 7001	(Pantone 444)
or	red	RAL 3020	(Pantone 485)
or	blue	RAL 5010	(Pantone 301)
or	blue	RAL 5012	(Pantone 307)
or	green	RAL 6001	(Pantone 349)
or	similar colours		

42) Control light **Gen**. : red permanent light
on = Generator not charging the battery
off = Generator charging the battery

43) Digital readout selector switch CHT/battery voltage for the right hand display
CHT °C Battery V
centre T= Cylinderhead (water) temperature CHT displayed in °C
right B= battery voltage displayed in V.
The switch returns by itself into the T position.

44) Exhaust gas temperature EGT indication (Option).
Switch No. 43 to the left: EGT in °C is displayed on the centre display for the front cylinder and on the right hand display for the rear cylinder. **E** will be displayed on the left hand display. **E 55 54** (55 means 550°C)
If the EGT of one or of both cylinders exceeds the max. permissible value of 650° C (1202° F) all 3 displays, 45, 46 and 47, start blinking and the EGT will be displayed, e.g. **E 71 70** .

Warning: If 650°C will be exceeded, the engine speed must be reduced so far, that the EGT's will return into their limits, to avoid engine damage. High EGT's are likely to occur in horizontal cruising flight. If the EGT's are too high in climb, this may indicate too lean a carburettor setting, or the start of piston damage.

Below 200°C **E --- ---** will be displayed if the probes are connected and working. Otherwise nothing will be displayed.

45) Display for the fuel level in the fuselage tank in liters.
Fuel **liter** :The amount displayed is the total amount in the tank less 1 l (0.26 U.S.gal.) unusable amount.

If the displayed fuel level is lower than 5 l (1.32 U.S.gal.) an L (low) is displayed in front of the liter number as a warning.

When reaching the non usable amount of fuel LL will be displayed and the display starts blinking.

Note: With a fuel level of less than 5 l (1.32 U.S.gal.) the fuel indication is no longer independent on the pitch attitude of the aircraft. If you fly with low pitch attitude less fuel than real will be displayed.
With more than 5 l (1.32 U.S.gal.) fuel the indication is nearly independent of pitch altitude due to the second fuel level probe.

46) Display for the engine speed x 10 **engine speed RPM x 10**
e.g. 602 means 6020 RPM engine speed. When exceeding the max. continuous engine speed of 6900 RPM a blinking double point will appear in front of the last digit, e.g. **6 9:1** .
When exceeding the max. engine speed of 7200 RPM the whole display starts blinking **7 2:1** .
After switching off the ignition (DEI still switched on) 3 dashes will be displayed **- - -** .
As soon as the propeller is aligned or the ignition is switched on again, the engine speed will be displayed.

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. Water ballast can be left in the wings, for a few days only, but not when there is the possibility of freezing! On sunny days the cockpit should be closed and covered.

Note: Longer parking with exposure to sun and humidity will cause premature ageing of the skin of your sailplane.
Don't park the rigged glider with filled wing fuel tanks for extended periods!

8.5 Trailering

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

Approved fitting points:
Inner 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 and outboard wing panels:
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.