ALEXANDER SCHLEICHER SEGELFLUGZEUGBAU
D-6416 Poppenhausen / Wasserkuppe

# Flight and Operations Manual

for the Sailplane Type

A S W 1 7

May 1976 Edition

This manual is always to be carried on board.

It belongs to the Sailplane ASW 17

Serial No. : .....

Registration No. : .....

Owner : .....

.....

.....

Manufacturer : Alexander Schleicher
Segelflugzeugbau
D-6416 Poppenhausen /
Wasserkuppe

This manual is the translation of the German original which is approved by the Federal Office of Civil Aeronautics of the Federal Republic of Germany (LBA). The translation has been done by best knowledge and judgement.
In any case the original text in German language is authoritative.

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## 1.2 Operation Values and Limitations

### Speed Limits :

| | | | |
|---|---|---|---|
| At Flap Setting | 1 | 250 km/h | 135 knots |
| At Flap Setting | 2+3 | 180 km/h | 97 knots |
| At Flap Setting | 4 | 150 km/h | 81 knots |
| With full control deflections (manoeuvering speed ) | | 180 km/h | 97 knots |
| For aerotow | | 180 km/h | 97 knots |
| For auto and winch tow | | 120 km/h | 65 knots |

The following color codes show on the airspeed indicator :

| | | | |
|---|---|---|---|
| Red radial mark at | | 250 km/h | 135 knots |
| Green arc | 80 - | 180 km/h, | 43 to 97 kts |
| Yellow arc | 180 - | 250 km/h. | 97 to135 kts |

### Weights :

| | | | |
|---|---|---|---|
| Empty weight with minimum equipment approx. | | 415 kg | 915 lbs |
| Maximum all-up-weight | | 610 kg | 1345 lbs |
| Maximum weight of non - lift producing members | | 245 kg | 540 lbs |
| Water ballast in wings according to cockpit load | 40 - 90 | kg, 88 to | 198 lbs |

See loading schedule page 10

### Weak Link in Towline

| | | |
|---|---|---|
| Aerotow and winchtow | 600 kg | 1323 lbs |

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## Inflight Center of Gravity

Reference point is the leading edge of the wing root rib.
Horizontal reference line is the center line of the conical fuselage aft section. An equivalent to that is a wedge template 1.000 : 37 set up " level " on the top of the fuselage aft section ( see page 33 " rigging data " in the appendix ).

The " Inflight Center of Gravity " range extends from 0.340 m ( 13.39 inch ) behind reference point to 0.460 m ( 18.11 inch ) behind reference point.

## Permissible Load factors

| | |
|---|---|
| Maximum positive load factor | + 5.3 |
| Maximum negative load factor | - 2.65 |
| at 180 km/h ( 97 knots ) | |
| Maximum positive load factor | + 4.0 |
| Maximum negative load factor | - 1.5 |
| at 250 km/h ( 135 knots) | |

## Notes

The sailplane is suited for cloud flying. Flights under icing conditions are not recommended.
The experiences during the World Championships have shown that in the area of the rather narrow control gaps, any rain or condensation drops dry off relatively slowly and turn to ice when climbing above the freezing level. Therefore, one has to expect a stiffening of the controls, leading to blocking of controls in extreme cases. Isolated climbs above the freezing level with a dry sailplane did not lead to any stiffening of the controls, even though the leading edges of wings and control surfaces showed severe icing.

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If flights are made without seat back panel, a stiff cushion must be used which protrudes beyond the edges of the tow hook fairing and the wheel fairing. Extremely tall pilots will significantly improve their seating comfort by wearing gym shoes ( warm socks underneath ) or shoes with flat heels.

## 1.3 Minimum Equipment

Airspeed indicator with range 30 - 270 km/h ( 16 to 146 knots )
Safety belt and shoulder harness
Parachute or back cushion with 8 cm ( 3.15 inch ) minimum thickness when compressed
Altimeter

Additional minimum equipment for cloud flying :

Electric turn and bank indicator
Compass
Transceiver ( Federal Rep. of Germany only)

Experience to date has shown the pitot pressure system for the airspeed indicator satisfactory for cloud flying.

If the compass cannot be properly compensated on the instrument panel, it should be mounted on the inside of the canopy ( say above the control stick or on the right cockpit wall in the area above the map pocket ).

Instruments which weigh more than 1.000 grams ( 2.2 lbs ) should not be mounted solely with the 4 instrument screws, but should be braced against one or possibly several of the rubber instrument panel mounts.

## Loading with Water Ballast

**The maximum permissible weight of 610 kg must not be exceeded. For a determination of the correct amount of water ballast the following chart may be used :**

**Maximum permissible water ballast liters ( l )**
**Weight of pilot and parachute ( kg ) : ⟶**

| Empty weight (kg) see page 22 ↓ | 75 | 85 | 95 | 105 | 115 |
|---|---|---|---|---|---|
| 390 | full | full | full | full | full |
| 400 | full | full | full | full | 95 l |
| 410 | full | full | full | full | 85 l |
| 420 | full | full | 95 l | 85 l | + |
| 430 | full | 95 l | 85 l | + | + |
| 440 | 95 l | 85 l | + | + | + |

**Maximum permissible water ballast in U.S. gal.**
**Weight of pilot plus parachute in lbs : ⟶**

| Empty weight (lbs) see page 22 ↓ | 165 | 187 | 209 | 231 | 253 |
|---|---|---|---|---|---|
| 860 | full | full | full | full | full |
| 882 | full | full | full | full | 25 gal. |
| 904 | full | full | full | 25 gal. | 22,5gal. |
| 926 | full | full | 25 gal. | 22,5 gal | + |
| 948 | full | 25 gal. | 22,5gal. | + | + |
| 970 | 25 gal. | 22,5 gal. | + | + | + |

**These weight combinations due to very high payload exceed the maximum permissible weight of the non - lift producing parts.**

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## 1.5 Operating Handles, Placards and Nomenclatures

**Plate :**

**Segelflugzeugbau A. Schleicher Poppenhausen**

Type: ASW 17 S. No. 17 xxx

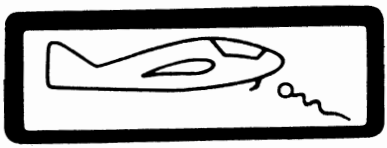
| Airspeed limits: | knots | km/h |
|---|---|---|
| Winch and auto tow | 65 | 120 |
| Aero tow | 97 | 180 |
| Rough air conditions | 135 | 250 |
| Calm air conditions | 135 | 250 |

Trimming plan

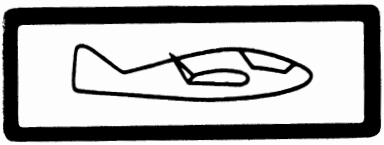
Load in the front seat (incl. parachute):

single / dual max. see Flight - Manual min. see Flight - Manual

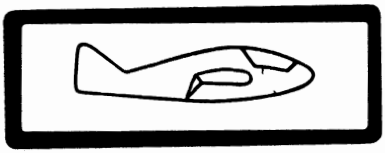
Pilots of less weight have to complete the weight by a reliablely fixed lead cushion



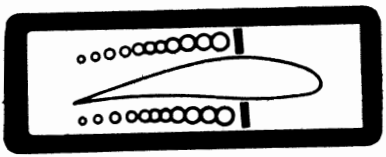
**Tow Release :**
Yellow knob on LH area next to the control stick



**Flaps :** (negative for high speed flight )
Black handle on upper left cockpit wall



**Flaps :** (positive for slow flight )



**Dive Brakes :**
Blue handle on middle left cockpit wall;
Pull = dive brakes out

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## Wind Launch

Permissible maximum speed: 120 km/h (65 knots).
Recommended flap setting: 3 ( 0° )
If C of G is in the middle or towards the rear the sailplane will lift off by itself and will assume a moderate climb attitude. Once the safety altitude is reached, slight back pressure can be applied with the control stick. The winch launch using the aerotow hook has not been tested by the factory.

## Aerotow

Permissible maximum speed: 180 km/h (97 knots).
This speed is only permitted in flap positions 3, 2 and 1. Tow rope lenghts are usually from 20 - 60 m (65 to 200 ft). The aerotow can be made using the aerotow or winchtow hook.
For the roll off the flap handle is set to position 2 or 1. Once sufficient aileron control has been obtained - at approx. 50 km/h (27 knots) - the flaps should be set to position 4. This will take considerable weight off the landing gear and the sailplane will lift off at the earliest possible moment. If sufficient headwind prevails the entire aerotow can be made using flap setting 3.
After the safety altitude has been reached, the landing gear can be pulled up. To release from tow the yellow release knob is pulled all the way to the stop. Heavy pilots should use back pressure on the stick during take-off roll. This keeps the tailskid forced to the ground and minimizes any breakout tendencies during crosswind take-offs.

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## Free Flight

Because of the possibility of loading the ship with waterballast, the flying weight varies in a wide range. The following data pertain to a flying weight of 500 kg (1100 lbs.). For the maximum flying weight of 610 kg (1345 lbs.) the values in parentheses apply.

The minimum speed in level flight for flap 4 position is 66 km/h (74 km/h), 36 knots (38 knots),

flap 3 71 km/h (80 km/h) / 38 knots (43 knots),
flap 2 78 km/h (86 km/h) / 42 knots (46 knots),
flap 1 81 km/h (90 km/h) / 44 knots (49 knots),

The minimum speeds in turning flight are higher. One should expect an increase in stalling speed of 10 % for 30° banks and 20 % for 45° banks.

The optimum flap settings for optimal flying are shown in the polar diagram page 37. One should consider here also that all speed values will increase by the above-mentioned percentage with increasing angles of bank.

For thermalling the flap setting 4 is optimal up to 100 km/h, if an angle of bank of about 40° is used.

The highest possible wing loading is by no means always the most favourable one. The task should always be taken into consideration.

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For distance tasks ballast is not needed, since the slightly higher cruising speed is not nearly as essential as the optimal utilization of the weak morning and evening thermals. For speed tasks the following guidelines apply :

Average climb rate 0 - 1 m/sec. (2 knots, 200 ft. p. min.) = lowest possible wing loading - less than 33 kg/m$^2$ (6,76 lbs. p. sq. ft.) if possible.

Average climb rate 1.5 m/sec. (3 knots, 300 ft. p. min.) = flying weight about 520 kg (1150 lbs.). (Wing loading about 35 kg/m$^2$ = 7,17 lbs. p. sq.ft.).

For climb rates over 2 m/sec. (4 knots, 400 ft. p. min.) the maximum flying weight of 610 kg (1345 lbs.) should be used (wing loading of 41,4 kg/m$^2$ (8,48 lbs. p. sq.ft.).

Dangerous Flight Attitudes

The ASW 17 has an extremely harmless stall, which is indicated by very great stick movements and yet very minimal speed changes. The aileron effectiveness also is markedly reduced as the stall is approached. Even in fully stalled flight attitude (in calm air the vario will show 1.5 - 2 m/sec. sink) the aileron as well as rudder are reasonably effective, as long as only half size control movements are used.
Full control movements lead to a slight wing dropping. Crossed and fully deflected controls, together with the stick pulled full back lead to a dropping of a wing. If these crossed controls are initiated from circling flight, the wing dropping movement is more vehement than from normal flight. If the sailplane after the wing dropping goes into a spin, depends primarily on the flap setting and only to a lesser degree on the C of G position.

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The tire pressure should be 2.2 - 2.4 atu (31 - 34 psi) for flying weights of approx. 500 kg and for the maximum flying weight of 610 kg 3.1 - 3.3 atu (44 - 47 psi).
Insufficient tire pressure causes the tire to deform too much during landing and might lead to damage of the landing gear doors.

Lubrication of Bearings

The ball bearings are covered as much as possible and therefore do not require any care for a longer period of time. The rudder hinges are inspected and lubricated during the annual maintenance inspection. If necessary, the rudder axle will be dismantled for this lubrication. The flap bearings, which for aerodynamic reasons are located on the underside of the wings, are especially subject to dirt pickup and must therefore be periodically checked.

The skidplate has to be removed in time or should be protected against excessive wear by welding several stellite beads to it.

The rubber tail skid has been designed in such a manner that it will shear off under strong sideloads. It can be glued back on or repaired with contact cement. It is important to cover the gap from rubber skid to fuselage in order to prevent any peeling and catching of long grass.

The towing hooks are especially exposed to soil and dirt and require frequent cleaning and oiling. For that, the fiberglass fairing below the instrument panel or aft of the seat pan has to be removed.

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