

Every pilot knows from his instruction time that the minimum speed goes up in steep turns or when loading the aircraft with ballast ( fuel, flight instructor ). In conformity to the same law as the minimum speed the speed ranges of the single flap settings do also shift by chagement of the wing loading and/or the load factor.

The following table will show to you the coherencies. The data stated are based on performance measurements.

For the 16,59 m span version the upper part of the table for 33 kg/m<sup>2</sup> or 6.75 lb.p.sq.ft. wingloading are valid.

m/S (kg/m <sup>2</sup> )	Load- factor n	V <sub>min.</sub> (km/h) FlapL	Low-drag speed range (km/h)			
			Flap 4	Flap 3	Flap 2	Flap 1
33	0,5	47	50 ÷ 60	60 + 81	81 ÷ 117	117 over
33	1,0	66	70 ÷ 85	85 + 114	114 ÷ 165	165 over
33	1,3	75	80 + 97	97 ÷ 130	130 ÷ 188	188 over
33	2,0	93	99 + 120	120 ÷ 161	161 ÷ 220*	220 over
43	0,5	54	57 ÷ 68	68 ÷ 92	92 ÷ 134	134 over
43	1,0	75	80 + 97	97 ÷ 130	130 ÷ 188	188 over
43	1,3	86	91 ÷ 110	110 ÷ 148	148 ÷ 215	215 over
43	2,0	106	113 + 137	137 + 184	184 ÷ 220*	220 over

\* Maximum speed for this flap setting!

m/S (lb/sq.ft.)	Load-factor n	V <sub>min.</sub> [kts] Flap L	Low-drag speed range [kts]			
			Flap 4	Flap 3	Flap 2	Flap 1
6,75	0,5	25,5	27 + 32,5	32,5 + 43,5	43,5 + 63	over 63
6,75	1,0	35,5	38 + 46	46 + 61,5	61,5 + 89	over 89
6,75	1,3	40,5	43 + 52,5	52,5 + 70	70 + 101,5	over 101,5
6,75	2,0	50	53,5 + 65	65 + 87	87 + 118,5*	over 118,5
8,8	0,5	29	31 + 36,5	36,5 + 50	50 + 72	over 72
8,8	1,0	40,5	43 + 52,5	52,5 + 70	70 + 101,5	over 101,5
8,8	1,3	46,5	49 + 59	59 + 80	80 + 116	over 116
8,8	2,0	57	61 + 74	74 + 99	99 + 118,5*	over 118,5

\* Maximum speed for this flap setting!

Now these above-mentioned coherencies should not confound the ASW 20-pilot nor make him give up because it is too complicated. There is a very simple method of estimating the correct flight attitude.

The flap has been designed such that the change-ment of the angle of attack produced by flap de-flection just compensates the difference of angle of attack which results from the new flight atti-tude. This means that the fuselage and tailplane remain always almost parallel to the airflow.

Since the glide angle is very flat for the whole speed range of the ASW 20, the relation of the ship to the horizon remains the same for load factor 1 ( 1g ) provided that the flaps are used properly. A simple pitch indicator will move on-ly in a small range, even in turns and other ac-celerated maneuvers, and, therefore, is a good control instrument for the low drag- angle of attack. ( This is, however, not true for flap position L or for extended air brakes because in this case you are leaving intentionally the aero-dynamically optimum ranges in order to produce more drag ).

The table also shows the control actions for some flight maneuvers.

Principally, a flapped glider has two pitch con-trols : flaps and elevator. However, only one combination of both control settings results in optimum performance for a given flight attitude.

Case 1

Acceleration from thermalling to fast cruise :

According to the law that energy remains constant we can only pick up speed ( kinetic energy ) by giving away altitude ( potential or static energy ) with regard to the air around us. This is only possible by reducing our g-load ( or load factor ) below 1.

For thermalling our speed was 85 km/h and  $n = 1.3$  ( because of  $40^\circ$  bank ) in flap position 4. Now we want to accelerate downwards (  $n = 0.5$  ) and, pursuant to our table, therefore simultaneously must reduce bank and put the lever at least into No. 3 position, but as soon as our speed exceeds 76 km/h we must even put the flap lever into position No. 2. If we now do not do anything else, the static stability of the sailplane will balance out at approximately 120 to 150 km/h and load factor 1. If we want to fly faster, we have to set flap position No. 1.

The stick shows only little movement during the whole maneuver which manifest itself also by the fact that the trim hardly needs to be adjusted. With a conventional rigid profile wing the whole trim range would be needed for such a maneuver.


Case 2

Pullup into a thermal from very high speed ( wing loading  $33 \text{ kp/m}^2$  ) :

From fast cruise of 200 km/h (  $1g$  ) a pullup into a thermal shall be done. This is impossible without increasing the load factor. Since turbulence is to be expected, a mild  $1.3g$  - pullup should be initiated.

A glance at the table shows that at  $n = 1.3$  and 200 km/h (108 kts) the pilot should still fly at flap setting 1.

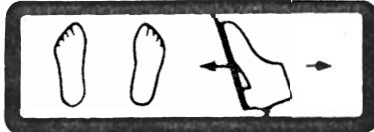
Hence the pull up should first be started by pulling in up elevator. At about 188 km/h (101,5 kts) flap setting 2 is selected. The aircraft is now climbing so steeply that the elevator can be neutralized to produce a straight climb at  $n = 1$ ; flap setting 2 is best up to approximately 114 km/h (61,5 kts), then flap setting 3 is selected. In order to end the climb; we briefly select flap setting 2 which produces  $n = 0,5$ , start the thermal turn at about 85 km/h (46 kts) and select directly flap setting 4. During this maneuver also the control stick is only required to make very minor corrective movements and the trim will need only slight adjustment.

- On a flapped glider the flap control is the more active means of pitch control while the elevator is more or less a corrective control.
  - The flap control affects the lift of the wing directly and is, therefore, much more sensitive than the elevator control which alters the angle of incidence of the wing by rotating the aircraft and, therefore, alters the lift relatively slowly.
  - During high-speed flight above 140 km/h (76 kts) the elevator control alone is used, as the flap setting 1 covers a large angle of incidence range.
-  When flying close to the ground (landing approach, ridge soaring, passing the finishing line) and also when thermalling together with several aircraft, the flaps must on no account be operated, because of the resultant abrupt changes in altitude which are difficult for the pilot to judge.

1.2. Operating Handles, Placards, and Nomenclatures

Stick with wheelbrake lever and transmitter button ( optional ) .

Rudder pedal with longitudinal adjustment.



Rudder pedal adjustment :  
grey knob RH of control stick

To move pedals back :

Take load off pedals and pull back. Release control knob suddenly and put slight pressure on pedals to adjust them.

To move pedals forward :

Pull knob and simultaneously push pedals forward. Release control knob suddenly and lock in place by putting slight pressure on pedals.

Flap control : Black lever on upper LH cockpit wall.

Marking of the essential flap positions by numbers 1, 2, 3, 4, and L below the flap lever.



Flap lever in high speed position.



Flap lever in landing position

1.3 Operation Values and Limitations

If a sailplane can be operated in two variants, the lower/limited variant is to be indicated on placards and A.S.I. color markings according to the airworthiness requirements.

Therefore, for the ASW 20 L the operational limitations of the 16,59m span version are given on the placard and on the A.S.I. markings. The operational limitations of the 15m span version are only to be found in this manual.

Maximum indicated airspeeds

( equivalent airspeeds are about 5 % higher, see page 55 )

	Span : 16,59 m		15 m	
	km/h	knots	km/h	knots
For flap position 1 (below 3000m m.s.l./ 9000 ft m.s.l.)*	250	135	265	143
For flap positions 2 and 3	200	108	200	108
For flap position 4	160	86	160	86
For flap positions L (landing positions )	120	65	120	65
With full control deflections (maneuver speed)	160	86	175	94
In rough air **	165	89	180	97
For winch and auto tow	120	65	120	65
For aerotow	160	86	175	94
For extending landing gear	160	86	175	94

The colored calibration markings on the A.S.I. are valid for the 16,59m span version :

Red line at	250 km/h ( 135 knots )
Green range	90 - 165 km/h ( 48,5 - 89 knots )
Yellow range	165 - 250 km/h ( 89 - 135 knots )
White range	85 - 200 km/h ( 46 - 108 knots )
White marking 'WK L' at	120 km/h ( 65 knots )
" " 'WK 4' at	160 km/h ( 86 knots )
" " 'WK 2 + 3' at	200 km/h ( 108 knots )

\* see next page  
\*\*

For flap position L ( flaps  $38^{\circ}$  down, ailerons -  $8^{\circ}$  up ) minimum speed in level flight is :  
66 km/h or 35,5 knots  
( 75 km/h or 40,5 knots ).

Extending of the airbrakes ( spoilers ) increases minimum speeds by approx. 7 km/h or 4 knots.

In bankings the minimum speeds are increased. An increase of 10 % is valid for  $30^{\circ}$  bank, 20 % are valid for  $45^{\circ}$  bank.

About the proper use of flap settings this manual has already informed you at length in the pre-face pages 8 and 9.

Maximum approved wing loading is not always the most favorable, the type of flight rather has to be considered.

For long distance flights ballast is not necessary, since the optimization of weak morning and evening thermals matters and not a slightly increased cruising speed.

For speed tasks the following wing loadings are proposed :

0 to 1 m/s ( 200 feet per min. ), flying weight should be as low as possible ( wing loading below  $33 \text{ kg/m}^2$  or 6,75 lbs per sq.ft. ).

1,5 m/s ( 300 feet per min. ), flying weight about 360 kg or 800 lbs ( wing loading  $35 \text{ kg/m}^2$  or 7.2 lbs per sq.ft. )

If the rate of climb is higher than 2 m/s ( 400 feet per min. ), the ASW 20 L should fly with max. all up weight of 454 kg ( 1000 lbs ), which is only approved for the 15 m span version.



Dangerous Flight Attitudes

The ASW 20 L has an extremely harmless stalling flight which is indicated by large stick movements without noticeable speed change. The aileron effectivity, too, is noticeably weaker when stalling speed is reached. In all configurations approach to stall speed can be noticed by slight tail buffeting.

Even in stalled flight attitude ( the vario will read 1,5 to 2 m/s sink in calm air, that is 300 to 400 feet per min. ) ailerons and rudder work in the usual manner, as long as only half control deflections are applied. Full control deflections result in light wing dropping, whereas full deflected controls in opposite directions with stick pulled completely back will cause rapid wing dropping.

Initiated from turning flight wing dropping is more rapid than from level flight.

The loss in altitude for wing dropping is about 20 m ( 60 feet ). For flap position I ( landing position ) loss in altitude can be 50 m until recovery, since the airflow may separate from the horizontal tail surface, if the elevator remains in full up deflected position. For recovery move stick in less pulled back position, until elevator effectivity is regained.

Only at rear C. of G. positions ( near minimum cockpit load ) the ASW 20 will not maintain a stationary stall with the stick hard back, but starts 'porpoising'.

Full deflections of rudder and aileron will cause wing dropping, opposite rudder and aileron deflections will lead to a spin. Wing dropping as well as spinning are terminated with the ( German ) standard procedure ( opposite rudder and elevator neutral, see page 25 ).

If no corrective measures are taken, the sailplane will terminate the sideskid or spin by itself and will pass into a spiral-like side slip. This

side slip can also be terminated with opposite rudder, before the ship eventually changes to a spiraldive with the typical build-up of high speeds.

At forward C. of G. positions the ASW 20 L spins very steeply and starts spiraldive after less than one turn, whereas at rear C. of G. positions the glider's pitch becomes steeper and steeper after an initial flat and slow turn ( approx.  $30^\circ$  negative pitch ) until the transition into spiraldive develops after 5 to 7 turns.

Raindrops, hoarfrost, and icing deteriorate the aerodynamic flow and will cause a change in flight characteristics. Therefore, a safety margin of 10 km/h, 5 knots or 7 mph should be added to the above speeds for level flight and circling. These speeds must be regarded as minimum speeds.

Again we point out that the ASW 20 L spins easier and flatter with positive (down) flap settings ( 4 + L ) than with negative (up) flap settings ( 2 + 1 ). Therefore, setting the flaps in negative positions is a measure to prevent wing dropping and spins. Because of the involved altitude losses ( about 15m = 50 feet ) this is impossible near the ground or when thermalling in gaggles. Here only a safety margin in extra speed compared to minimum speed is good airmanship.

### Landing

Lower the landing gear in time, at the latest in 100m ( 300 feet ) altitude, and put the flap lever in position no. 4.

The approach normally should be made at about 90km/h or 48,5 knots ( yellow  $\blacktriangleright$  at airspeed indicator ), this speed should be trimmed. For turbulent air a correspondingly faster speed must be flown. Only if the pilot is very sure that he can make the threshold of his airstrip, the flap lever is moved to position no. 5 ( flaps  $55^\circ$  down ).

The unmarked flap setting between 4 and 5 is a bit less effective as a landing flap. The limitations for this flap setting are the same as for position 5.

Because of the enormous aerodynamic twist of this flap configuration ( flap down, ailerons up ) the performance of the sailplane is bad in this flap setting. By extending of the airbrakes ( spoilers ) the performance can be further reduced ( glide ratio 5 in 1 at 85 km/h or 46 knots ) so that very steep approaches are possible with headwind.

- For strong headwinds flap setting No. 1 is not recommended because of the danger of landing short off the field.
- Those pilots having no experience with flaps for landings should only use flap setting 4 for headwind landings !

Setting the flaps from position No. 1 back to position No. 4 is not recommended near the ground because of the danger of loss in altitude. This maneuver should only be done after plenty of training at a safe altitude and in a very careful manner.

In flap position No. 4 sideslippling is very effective with the ASW 20L. At low bank and high yaw angles the loss in performance is great.

In flap position No. 1 such great yaw angles are impossible.

Because of the good landing qualities which can be achieved by flap setting 1 in combination with the variable effectivity of the spoilers sideslippling is restricted to extreme situations ( approaches in rain, snow-showers or into the sun ), since then the landing field can be observed more easily through the slide window.

Therefore, landing with sideslip should be practiced occasionally under good conditions.



Water ballast must be dumped before landing !

## 2.1 Rigging

All pins and fittings including the ball pip fittings are to be cleaned and lubricated.

Put the flap lever in position 2 as to avoid that the pushrods running from the wing into the fuselage interfere with the mixer and thereby become bent. Insert right wing ( 2-prong spar end ) from the side into the fuselage tunnel, then left wing from the opposite side. Align the main fittings, push in the main pins and safety. Now the wing tips can be released.

Connect ailerons and dive brakes and double-check the connection by trying to pull the push-pull rods away from the ball fittings.

The horizontal tail, first, is only inserted into the vertical tunnel of the fin. Then the ball fitting at the elevator is connected. And now the horizontal tail is pushed back until the Allan bolt at the nose can be screwed in.

The taping of the wing-fuselage junction with a plastic tape makes a lot of performance with but small expenditure ( 1-2 points on the L/D ).

The inspection hole cover of the fuselage must also be taped so that its cover plate cannot be sucked off at high sir pressure loads.

Do not tape the canopy gap, otherwise any emergency exit is jeopardized.

It is recommended to wax the taping area prior to taping so that the tape can be removed later on without pulling off the finish.

Normally the wing is fitted to the fuselage in its 15 m span version, as the trailers are not large enough to take up the long extended wings. However, it is permissible to rig the wing also in its long span version.

The short wingtips respectively the wing extensions are assembled by using the Allan bolt M10 of the horizontal tail or the assembly bolt M10. Screw this bolt into the spring-loaded safety pin and pull it out. Now remove the short wingtip and fit the wingtip ex-

tension, in doing so the two surfaces must be brought carefully into line before sliding the aileron connection together, otherwise these may be damaged.

The short wingtip respectively the wingtip extension is correctly fitted when the safety pins are flush with the wing skin.

### Loading of the Water Ballast

Water ballast must only be filled into the rigged glider and is only approved for the 15m span version. On page 22 of this manual the max. permissible amount of water is determined.

Take care that both wings get the same amount of water. This may easily be verified by levelling the loaded glider. If the loading of water is not symmetrical, one connects both exit pipes by means of a short tube and opens both valves. With level wings the ballast will become nearly symmetric. After the balancing the valves are reclosed and the connection tube is removed.

Filling is done through the exit pipe near the landing gear doors by using a big funnel. The filling with pressure water is strongly prohibited because the ventilation pipe is too narrow and the water pressure becomes too strong when the reservoir is full and will blow up the wing.

Each wing tank takes about 60 l ( 15.8 USGal. ). However, this maximum cannot be carried as every lateral acceleration will press some water through the ventilation.

Therefore, you either fill the tanks full up and then drop one gallon ( open the valve approx. 10 seconds ) or fill each side from the first with only 15 gallons.

Table dated: 07.04.83

(Dimensions in m.m.)

Control surface movements: ASW 20 B/BL/C/CL

Flap lever setting	Control stick position	Aileron MPE=79mm		STARBOARD WING Flap MPE=14,8mm		PORT WING			
		specified	actual	specified	actual	Flap specified	Flap actual	Aileron specified	Aileron actual
① -12°	Right	-30 ±3	-39 ±5	-39 ±5	-39 ±5	-23 ±5	-23 ±5	-35 ±3	-35 ±3
	Neutral	-16,5 ±1,5	-31 ±2,5	-31 ±2,5	-31 ±2,5	-31 ±2,5	-31 ±2,5	-16,5 ±1,5	-16,5 ±1,5
	Left	-3,5 ±3	-23 ±5	-23 ±5	-23 ±5	-39 ±5	-39 ±5	-30 ±3	-30 ±3
② -6°	Right	-29 ±3	-27 ±5	-27 ±5	-27 ±5	-3 ±5	-3 ±5	+11 ±3	+11 ±3
	Neutral	-8 ±1,5	-15,5 ±2,5	-15,5 ±2,5	-15,5 ±2,5	-15,5 ±2,5	-15,5 ±2,5	-8 ±1,5	-8 ±1,5
	Left	+11 ±3	-3 ±5	-3 ±5	-3 ±5	-27 ±5	-27 ±5	-29 ±3	-29 ±3
③ 0°	Right	-22 ±3	-12 ±5	-12 ±5	-12 ±5	+12 ±5	+12 ±5	+19 ±3	+19 ±3
	Neutral	0 ±1,5	0 ±2,5	0 ±2,5	0 ±2,5	0 ±2,5	0 ±2,5	0 ±1,5	0 ±1,5
	Left	+19 ±3	+12 ±5	+12 ±5	+12 ±5	-12 ±5	-12 ±5	-22 ±3	-22 ±3
④ +9°	Right	-11 ±3	+11 ±5	+11 ±5	+11 ±5	+35 ±5	+35 ±5	+27 ±3	+27 ±3
	Neutral	+10 ±1,5	+23 ±2,5	+23 ±2,5	+23 ±2,5	+23 ±2,5	+23 ±2,5	+10 ±1,5	+10 ±1,5
	Left	+27 ±3	+35 ±5	+35 ±5	+35 ±5	+11 ±5	+11 ±5	-11 ±3	-11 ±3
Ⓛ -8° Ail. +38° Flap	Right	-29 ±4,5	+87 ±7,5	+87 ±7,5	+87 ±7,5	+106 ±7,5	+106 ±7,5	+5,5 ±4,5	+5,5 ±4,5
	Neutral	-11 ±1,5	+96,5 ±5	+96,5 ±5	+96,5 ±5	+96,5 ±5	+96,5 ±5	-11 ±1,5	-11 ±1,5
	Left	+5,5 ±4,5	+106 ±7,5	+106 ±7,5	+106 ±7,5	+87 ±7,5	+87 ±7,5	-29 ±4,5	-29 ±4,5

Rudder	MPE=310mm	Right	160 ±15
		Left	160 ±15
Elevator	MPE=145mm	up	-60 ±10
		down	65 ±50 ±5

Datum:   
 Serial No:   
 Signature:

\* MPE (Meßpunktdistanz zur Drehachse) = Distance from measuring point to pivot axis (m.m.)

Table dated: 07.04.83

Control surface movements: A.S.W 20 B/BL / C/CL

Flap lever setting	Control stick position	STARBOARD WING		PORT WING			
		Aileron MPE=79mm	Flap MPE=148mm	Flap	Aileron		
		specified	actual	specified	actual	specified	actual
① -12°	Right	- 22° ± 2°	- 15° ± 2°	- 9° ± 2°	- 2,5° ± 2°		
	Neutral	- 12° ± 1°	- 12° ± 1°	- 12° ± 1°	- 12° ± 1°		
	Left	- 2,5° ± 2°	- 9° ± 2°	- 15° ± 2°	- 22° ± 2°		
② -6°	Right	- 21° ± 2°	- 10,5° ± 2°	- 1,5° ± 2°	+ 8° ± 2°		
	Neutral	- 6° ± 1°	- 6° ± 1°	- 6° ± 1°	- 6° ± 1°		
	Left	+ 8° ± 2°	- 1,5° ± 2°	- 10,5° ± 2°	- 21° ± 2°		
③ 0°	Right	- 16° ± 2°	- 4,5° ± 2°	+ 4,5° ± 2°	+ 14° ± 2°		
	Neutral	0° ± 1°	0° ± 1°	0° ± 1°	0° ± 1°		
	Left	+ 14° ± 2°	+ 4,5° ± 2°	- 4,5° ± 2°	- 16° ± 2°		
④ +9°	Right	- 8° ± 2°	+ 4,5° ± 2°	+ 13,5° ± 2°	+ 20° ± 2°		
	Neutral	+ 7,5° ± 1°	+ 9° ± 1°	+ 9° ± 1°	+ 7,5° ± 1°		
	Left	+ 20° ± 2°	+ 13,5° ± 2°	+ 4,5° ± 2°	- 8° ± 2°		
Ⓛ -8° Ail. +38° Flap	Right	- 21° ± 3°	+ 34° ± 3°	+ 42° ± 3°	+ 4° ± 3°		
	Neutral	- 8° ± 1°	+ 38° ± 2°	+ 38° ± 2°	- 8° ± 1°		
	Left	+ 4° ± 3°	+ 42° ± 3°	+ 34° ± 3°	- 21° ± 3°		

Rudder	MPE=310mm	Right	30° ± 3°
		Left	30° ± 3°
Elevator	MPE=145mm	up	22° ± 3,5°
		down	5° ± 18° ± 2°

Date:   
 Serial No:   
 Signature:

\* MPE (Meßpunktentfernung zur Drehachse) = Distance from measuring point to pivot axis [m.m.]

Maximum permissible control surface play

The maximum permissible play can also be measured at the Measuring Points (MPE) at which the control surface deflections are measured. To do this, lock the controls in the cockpit so that they cannot move.

	MPE (mm / in)	Permissible play (mm / in)
Rudder	310 / 12,2	4,5 / 0,18
Elevator	145 / 5,71	3,0 / 0,12
Aileron	79 / 3,11	1,75 / 0,07
Camber-changing flap	148 / 5,83	2,75 / 0,11

The aileron connection to the attachable tip extension must have no play at all.

CONTROL SURFACE WEIGHTS AND TAILHEAVY MASS BALANCE MOMENTS

	Mass (kg)*	Moment (daNcm)
Rudder	2,8 - 3,6	8,6 - 11,0
Elevator	2,1 - 2,7	6,6 - 8,4
Aileron	1,76 - 2,10	1,88 - 2,53
Camber-changing flap	3,64 - 4,46	7,07 - 9,23
Aileron of the attachable tip extension	0,23 - 0,29	0,56 - 0,66

(\*The table in lbs and inlbs is given on page 50 a.)



The permissible control surface weights and tailheavy mass balance moments are:

	<u>Mass (lbs)</u>	<u>Moment (inlbs)</u>
Rudder	6,18 - 7,93	7,45 - 9,53
Elevator	4,63 - 5,95	5,72 - 7,28
Aileron	3,88 - 4,63	1,63 - 2,20
Camber-changing flap	8,02 - 9,83	6,14 - 8,01
Aileron of the attach- able tip extension	0,51 - 0,64	0,49 - 0,57

Spare Data Placard

*Segelflugzeugbau A. Schleicher Poppenhausen*  
 Type ASW 20 L S. No.

Data plate

Permission for:

Winch Launch	up to	<input type="text"/>
Aero tow	up to	<input type="text"/>
Max. speed	up to	<input type="text"/>
Maneuvering speed	up to	<input type="text"/>
Max. speed, rough air	up to	<input type="text"/>
Max. speed for flaps pos.	1	<input type="text"/>
Max. speed for flaps pos.	2	<input type="text"/>
Max. speed for flaps pos.	3	<input type="text"/>
Max. speed for flaps pos.	4	<input type="text"/>
Max. speed for flaps pos.	L	<input type="text"/>
Gear down	up to	<input type="text"/>


Weight and Balance

single  
 dual

max.  min.

Max. permissible  
 all up weight

Spare Placards

	
<b>A. Schleicher</b> 6416 Poppenhausen	
Muster :	AS - W 20 L
Werk Nr.:	20 XXX
Kennz.:	
<i>Made in West Germany</i>	

*Loading of baggage max.  
compartment 15 kp [33 lb]*

<b>Segelflugzeugbau A.Schleicher Poppenhausen</b> Type: AS W 20 L                      S.No.		
Data plate		
Permission for:		
Winch Launch	up to <input style="width: 100px; height: 20px;" type="text"/>	
Aero tow	up to <input style="width: 100px; height: 20px;" type="text"/>	
Max. speed	up to <input style="width: 100px; height: 20px;" type="text"/>	
Maneuvering speed	up to <input style="width: 100px; height: 20px;" type="text"/>	
Max. Speed for rough air	up to <input style="width: 100px; height: 20px;" type="text"/>	
Max. speed for flaps pos.	1 <input style="width: 100px; height: 20px;" type="text"/>	
Max. speed for flaps pos.	2 <input style="width: 100px; height: 20px;" type="text"/>	
Max. speed for flaps pos.	3 <input style="width: 100px; height: 20px;" type="text"/>	
Max. speed for flaps pos.	4 <input style="width: 100px; height: 20px;" type="text"/>	
Max. speed for flaps pos.	L <input style="width: 100px; height: 20px;" type="text"/>	
Gear down	up to <input style="width: 100px; height: 20px;" type="text"/>	
Weight and Balance		
single	max. <input style="width: 100px; height: 20px;" type="text"/>	min <input style="width: 100px; height: 20px;" type="text"/>
dual		
Max. permissible all up weight	<input style="width: 100px; height: 20px;" type="text"/>	