II.9 TOW RELEASES
For aerotow : nose release E 75
For winch tow : safety release Europa G 73

II.10 WEAK LINK IN TOW ROPE
Aerotow max. 600 ± 60 daN
Winch tow max. 1000 ± 300 daN

II.11 TIRE PRESSURE
Main wheel 5.00-5 : 2.7 bar
Nose wheel 4.00-4 : 2.0 bar
Tail wheel 210x65 : 2.5 bar

II.12 CROSSWIND
The permissible crosswind component is about 15 km/h.
(8 knots).
III. EMERGENCY PROCEDURES

III.1 RECOVERY FROM SPIN

According to the standard procedure spinning is terminated as follows:

1. Apply opposite rudder (i.e., apply rudder against the direction of rotation of the spin).

2. Short pause (hold control inputs for about 1/2 spin turn).

**Warning:** Disregarding the pause will result in slower recovery!

3. Release stick (i.e., give in to the pressure of the stick) until the rotation stops and sound airflow is established again.

**Warning:** Pull forward stick may retard or even prevent the recovery!

4. Centralize rudder and allow sailplane to dive out.

The altitude loss from the beginning of the recovery until the normal flight attitude is regained is about 80 meter (260 feet).

**Note:** During spins the ASK 21 oscillates in pitch. From a steep nose down spin recovery according to the standard procedure is up to 1 turn, from a flat spin less than 1 turn.

III.2 CANOPY JETTISON AND EMERGENCY BAIL OUT

Front canopy:

a. Move lever with red knob above the instrument panel to the left and push canopy upwards.

b. Open safety harness.

c. Get up and bail out.

d. With manual chute seize release grip and pull out entirely after 1 to 3 seconds.
Rear canopy: a. Pull back both canopy side locks and push canopy upwards.
b. Open safety harness.
c. Get up and bail out.
d. With manual chute seize release grip and pull out entirely after 1-3 seconds.

If circumstances allow, the front pilot should allow the rear pilot to bail out first.

III.3 FLIGHTS IN THE RAIN

With wet or slightly iced wings or insect accumulation there will be no deterioration in flight characteristics.

However, one has to reckon with a rather considerable deterioration in flight performance. This must be taken into account especially on landing final approach!!

Add a safety margin of 10 km/h (5.4 knots) for approach speed!!

14 April 1980 14
III.4 WING DROPPING

The sailplane stalls extremely benign. Nevertheless one always has to face the possibility of wing dropping because of turbulence. In that case push stick forward immediately and apply opposite rudder against a noticeable turn at the same time to regain a normal flight attitude. If the rudder deflection against the turn is forgotten, a spin may occur even if the stick pressure is released.

III.5 GROUND LOOPING

For normal conditions, smooth runway, short grass, one may take off with the wing on the ground without having to fear a change in the direction.

High grass and rough ground, however, may cause ground looping. In that case release the tow rope immediately.
IV.4 TAKE OFF

Winch tow:

Trim neutral.

Max tow speed: 150 km/h (81 kts).

The sailplane features a tow release for winch tow in front of the main wheel.

The most favorable tow speed is 90 - 110 km/h (49 - 60 kts).

There is little pitch up tendency during the initial tow. In the upper third of the tow additional altitude may be gained by slight back pressure.

Tow release: pull the release knob to the stop several times.

Aero tow:

Aero tows only with the nose release in front of the nose wheel.

Recommended tow rope length: 30-60 m (98-197 ft); textile rope.

Trim neutral.

Max tow speed: 180 km/h (97 kts).

The most favorable tow speed during climb is 90 - 140 km/h (49 - 76 kts).

Take off may be done with the wingtip on the ground. Getting the wings level is no problem. However, the pilot is advised to be careful with high grass and very rough ground.

Take off takes place at about 75 km/h (40 kts).

April 1980
IV.5 FREE FLIGHT

The sailplane may be flown up to Vne = 380 km/h (200 kts), see p.8. Up to maneuvering speed of 180 km/h (97 kts) full control deflections can be applied. At higher speeds the controls must be applied more carefully. At Vne only 1/3 of the max. possible deflections must be applied.

IV.6 LOW SPEED FLIGHT, WING DROPPING AND SPINS

With the stick back a distinct tail buffet is felt. The sailplane is very benign in low speed flight. By use of normal aileron deflections the wings may be kept level down to minimum speed, even with aft C.of.G.-positions.

With normal rudder deflections no wing dropping is found. Yaw angles of up to 5° have no significant influence on the wing dropping attitude.

Also rapid pulling up into 30° pitch does not cause wing dropping, but only a gentle nose drop. The same applies for stalling out of a 45° turn.

But one has to point out that even the most benign sailplane needs speed in order to be controllable.

In turbulence this is especially important when also a wing dropping may occur.

Spin development from wing dropping strongly depends on the C.of.G.-position and also to some extent from the pilot reaction.

For C.of.G.-positions forward of 315 mm aft of datum the ASK 21 does not spin at all. This configuration applies to 2 heavy pilots.

For C.of.G.-positions from 320 mm through 385 mm aft of datum, more incipient spin turns are possible followed by self recovery after 4 1/2 turns at most. Such C.of.G.-positions are possible in dual flight with a lightweight pilot in the front seat.

For C.of.G.-positions aft of 400 mm behind datum controlable sustained spins are possible. Such a C.of.G.-position is usually only possible with one lightweight pilot in the front seat.
Note: During spins the ASK 21 oscillates in pitch. From a steep nose-down spin recovery according to the standard procedure is up to 1 turn, from a flat spin less than 1 turn.

The speed at which the stall takes place depends on the payload. The following standard values are applicable:

**Single:** All up weight 470 kg (1034 lb): 65 km/h (35 kts) IAS
- without airbrakes 68 km/h (37 kts) IAS
- with airbrakes

**Dual:** All up weight 600 kg (1320 lb):
- without airbrakes 74 km/h (40 kts) IAS
- with airbrakes 77 km/h (42 kts) IAS

### IV.7 HIGH SPEED FLIGHT

The sailplane shows no flutter tendency within the permissible speed range. With airbrakes extended in a 45° dive the speed remains below \( V_{\text{X}} = 280 \text{ km/h (151 kts)} \); it goes up to 232 km/h (125 kts) at \( G = 600 \text{ kg} \).

### IV.8 CLOUD FLYING

For min. equipment for cloud flying see II.3 a and II.3 c.

According to past experiences the airspeed indicator system is not exposed to the danger of icing-up. However, with strong icing up the pilot must be always take into account the possible failure of the airspeed indicator. When planning cloud flying, he must take this point into consideration.

Excessive speeds during cloud flying must be avoided in any case. The pilot should try to keep an average speed of about 100 km/h (54 kts) and with increasing speed above 130 km/h (70 kts) he should use the airbrakes in order to control the speed.
IV.9 AEROBATICS

Attention aerobatic flyers!!

Even a sailplane which is approved for full aero- batics does not have infinite strength capacities. Most hazardous are aerobatics which get out of con- trol or are badly executed, as they result in the high loads.

Therefore, it is urgently recommended to have one- self guided by an experienced flight instructor. The ASK 21 being an approved two-seater for full aerobatics offers this possibility.

Such guidance is even prescribed according to §69 (4) of the German 'LuftFeraPO' (Aviation Personnel Test Regulations) dated January 9, 1976. Following §96 (3) of the said 'LuftFeraPO' an adequate experience is required from flight instructors.

Note!!

The normal airspeed indicator system shows a large pressure error in inverted flight during which the airspeed indicator reads 40 km/h (22 kts) too low. When extending the pitot head by attaching a brass tube - 125 x 11 x 140mm (5,5 in) in length - this error disappears. The tube must project in the front at least 70mm (2,75 in). For normal flights this is not necessary. In order to avoid damage when parking the sailplane in the hangar, this tube should not be left on any longer than necessary.