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GLIDER FLIGHT MANUAL

GROB G 102

CLUB ASTIR III

CLUB ASTIR III b

STANDARD ASTIR III

This handbook is to be kept on board the aircraft at all times.

This Glider Flight Manual is FAA approved for U.S. registered gliders in accordance with the provisions of 14 CFR Section 21.29 and is required by FAA Type Certificate Data Sheet No. G 33 EU.

It refers to the serie: _____

Registration: N90538 Factory Serial Number: _____

Owner: BRUCE McClellan

German edition of operating instructions are approved under § 12(1) 2. of LuftGerPO.

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

I. GeneralI.1. Log of revisions

Revision No.	Pages affected	Description	LBA approval signature	Date

All Manuals for GROB G 102 can be ordered at:

- Burkhardt Grob of America, Inc.
1070 Navajo Drive, Bluffton Airport Complex
Bluffton, OH 45817 (419)358-9015 or 9025
- Grob-Werke GmbH & Co. KG
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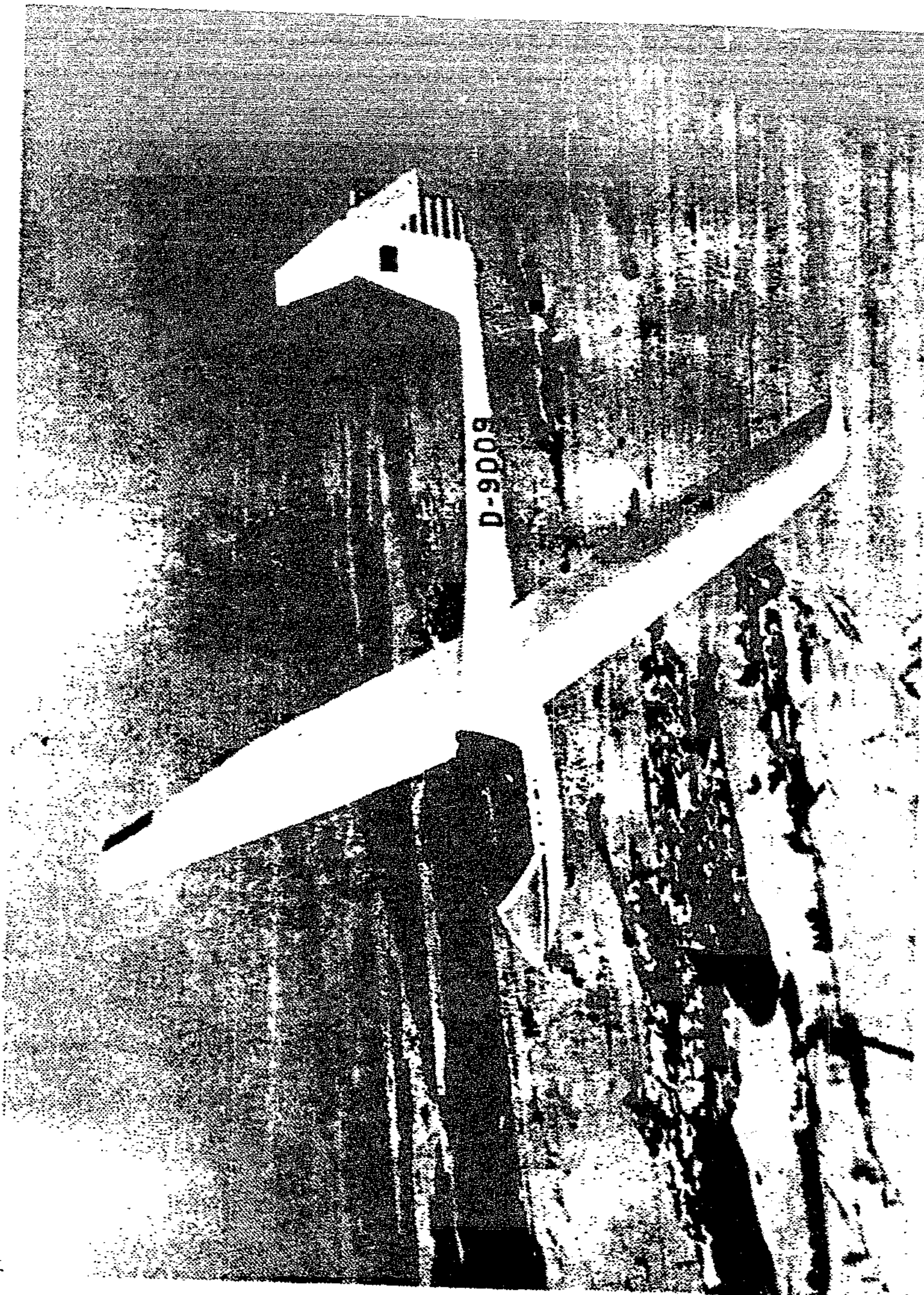
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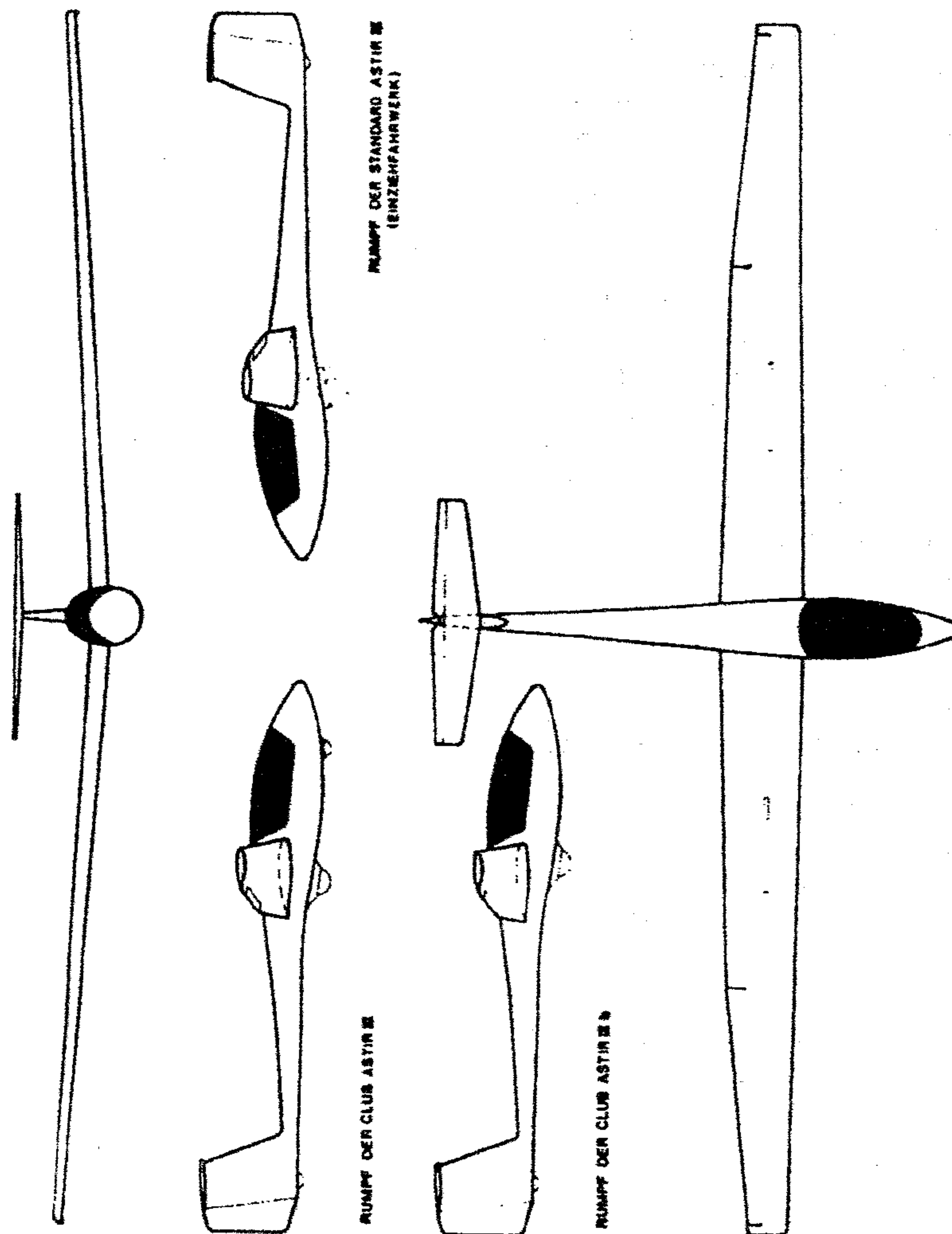
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I.4. Total view (photo)



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I.5. Three-side view



I.6. Description

The CLUB ASTIR III and IIIb a single seat performance glider for the club class with a T-tail and airbrakes on the upper wing surface.

The STANDARD ASTIR III is the equivalent high performance glider for the standard class, with retracting undercarriage and ballast tanks in the wings.

The glider incorporates the most modern fibre reinforced plastic technology. The fuselage stringers are fabricated from Carbon fibre; all other surfaces and shells are glass-fibre.

Technical Data

Wingspan	15,0 m	(49,2 ft)
Length	6,75 m	(22,1 ft)
Height	1,26 m	(4,1 ft)
Aspect ratio	18,2	(18,2)
Wing area	12,4 m ²	(133,5 sq.ft.)
Maximum flying weight with waterballast	450 kg	(992 lbs)
without waterballast	380 kg	(838 lbs)
Maximum wing loading	36,3 kg/m ²	(7,4 lbs/sq.ft)

II. Operating limitationsII.1 Category of airworthiness:

U (Utility) according to JAR 22

Certification Basis: 14 CFR Sections 21.23 and 21.29 effective 1 February 1965; and Joint Airworthiness Requirements for Sailplanes and Powered Sailplanes (JAR-22), dated 1 April 1980.

II.2 Permitted operations:

1. VFR day
2. Simple aerobatics (loop, stall turn, lazy eight, chandelle, spin)

II.3 Minimum equipment

1. Air speed indicator reading to 300 km/h (162 knots, 187 mph)
2. Altimeter
3. Four part safety harness
4. Back cushion of at least 3" depth when compressed, or parachute
5. Loading limit placard
6. Flight limits placard
7. Flight Manual

II.4 Airspeed limitations

Never exceed	VNE	250 km/h(135 kts,155mph)
Maximum Rough Air	VB	250 km/h(135 kts,155mph)
Manoeuvring speed	VM	170 km/h(92 kts,105mph)
Maximum on winch launch	VW	120 km/h(65 kts, 74mph)
Maximum on aerotow	VT	170 km/h(92 kts,105mph)
Maximum for operating landing gear, and L.G. extended	VT	250 km/h(135 kts,155mph)

"Rough air" includes the turbulence likely to be encountered in wave rotors, clouds, whirlwinds, and while flying over mountain ridges.

The manoeuvring speed is the maximum speed at which full control deflections are permissible. At VNE only one third of the available movements may be used. True airspeed is higher than indicated airspeed at altitude.

This fact has no influence on the strength and the aerodynamic loads on the sailplane. But for flutter prevention VNE must be decreased according to the following table.

Altitude (ft)	0-6500	10000	13000	16500	19000
VNE (indicated knots)	135	128	121	115	109
(indicated km/h)	250	237	225	213	202

Air speed indicator markings

72-170 km/h	39-92 kts	45-106mph	Green arc (normal range)
170-250 km/h	92-135 kts	106-155mph	Yellow arc (caution range)
At 250 km/h	135 kts	155 mph	Red line (max. speed)
At 90 km/h	49 kts	56 mph	Yellow triangle (minimum approach speed at max. flying weight)

Installation Errors of ASI

The airspeed indicator must be connected to the following sources: Pitot head in the tail fin, static vents side of the fuselage near the seat.

Using a calibrated ASI the position error is not greater than ± 2 km/h or 1 kt or 1,2 mph. A calibration curve is therefore not necessary.

II.5 Flight envelope

The following g-loads must not be exceeded.

At VM + 5.3 - 2.65 At VNE + 4.0 - 1.5
(Airbrakes closed)

II.6 Weight limits

Empty weight	appr. 260 kg (573 lbs)
Max. permissible without waterballast	380 kg (838 lbs)
Max. permissible with waterballast	450 kg (992 lbs)
Maximum permissible weight of non lifting parts	250 kg (551 lbs)

II.7 Center of gravity position

Permitted center of gravity positions in flight lie in the range

from 310 mm (12,20 inches) to
480 mm (18,90 inches)

behind the datum line, equivalent to 24% to 44% of the M.A.C. of the wing.

A/c attitude: incidence board of 600:26 angle horizontal on the back of the fuselage.

The datum line is the wing root leading edge.

The permitted center of gravity range will not be exceeded if the loading is carried out according to the loading plan in section II.8.

II.8 Loading limitations

Minimum weight in the seat 70 kg (154 lbs)

Maximum weight in the luggage space 10 kg (22 lbs)

Maximum weight in the seat 110 kg (242 lbs)

Pilot weights lower than 70 kg (153 lbs) must be compensated by ballast carried in the seat.

The maximum flying weight of 380 kg (838 lbs) without waterballast and of 450 kg (992 lbs) with waterballast must not be exceeded. Water ballast can only be loaded until this maximum weight is reached (see diagram on side 10a).

Water ballast can not be used to compensate locking weight in the seat.

Modifications of loading plan

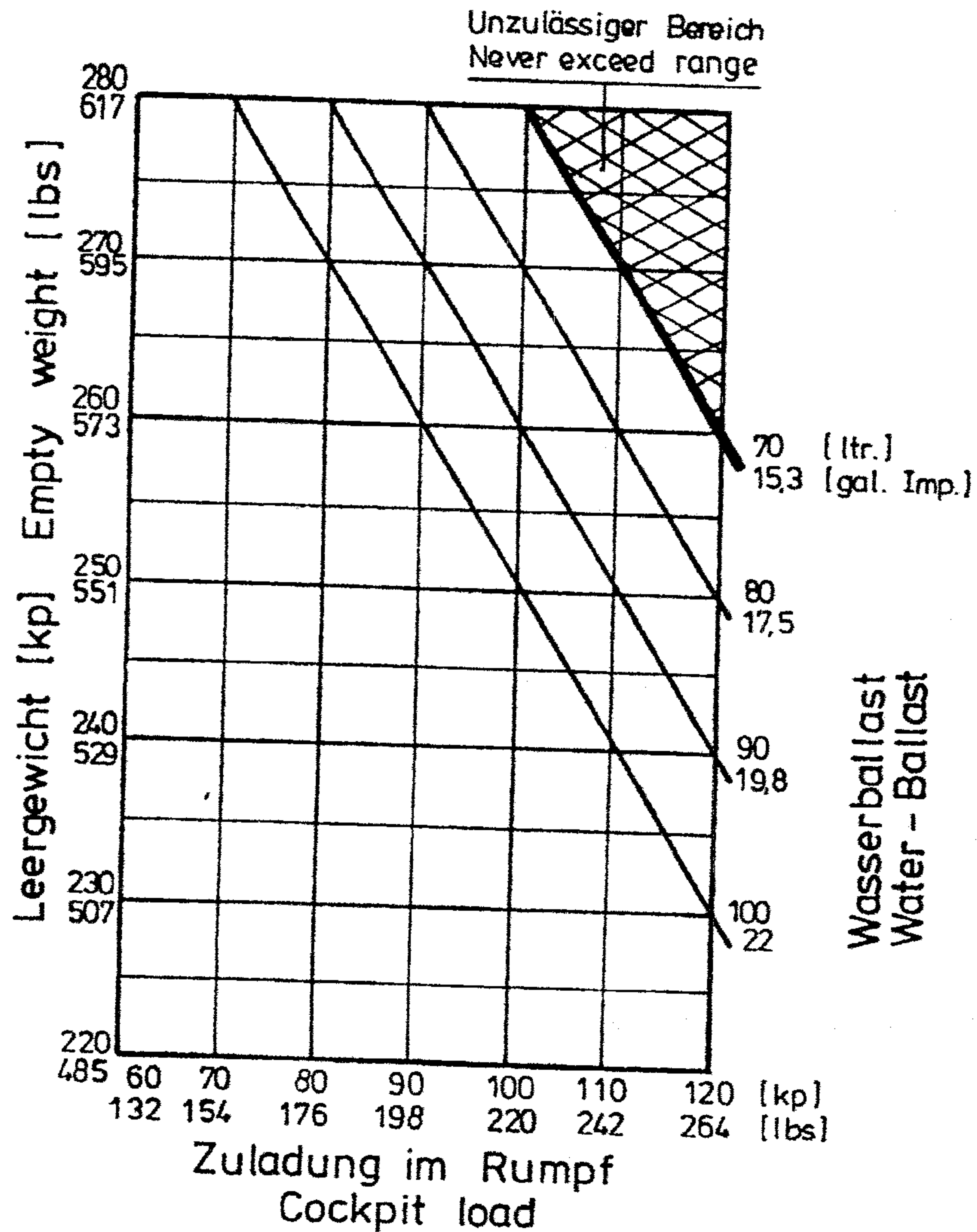
Registration: ---

Serial Number: 5531 S

Date of weighing carried out by:	Record of fitting-out. Date:	Empty weight kg (lbs)	Empty C of G (mm behind datum)	Max. Payload
08.04.81	08.04.81	265	702	110

This page was taken from previous flight manual 3-17-83 Tom Glyn

Waterballast chart (only Standard Astir III)



(einschließlich Gepäck; Baggage inclusive
and ballast in ballast box)

II.9 Tow hooks and cable length

For Aerotow: Optional nose hook E 75 with
modification 1-79

For Aerotow and winch launch: Europa G 73
safety hook.

Minimum aerotow cable length 40 m (130 ft)

Minimum launch cable length 600 m (1970 ft)

II.10 Weak link in launching cable

Aerotow and winch launch 500 kg (1100 lbs) ±10%
(e.g. Weak link no. 5,
colour code white)

II.11 Tire pressure

Tire size Main wheel 5.00-5 / Tire pressure
2,5 bar

Nose wheel and Tail wheel \emptyset 210 x 65 mm.
2,5 bar

II.12 Crosswinds

The maximum approved crosswind component for
take off and landing is 20 km/h (11 knots,
12 mph).

II.13 Placards and markings

Maximum weight		kg	lbs
without water ballast:		380	836
with water ballast:*		450	990
Airspeed limits	km/h	m.p.h.	kts
Never exceed	250	155	135
In rough air	250	155	135
Manoeuvring	170	105	92
On aerotow	170	105	92
On winch tow	120	74	64
Airbrakes	250	155	135
Gear extension	250	155	135

cockpit * (no valid for CLUB ASTIR III and IIIB)

Payload		
Payload (pilot and parachute)		
The maximum weight must not be exceeded.		
Minimum payload: 70 kg, 154 lbs.		
Less weight must be compensated with ballast in the seat or in the ballast box		
Maximum load	110 kg	243 lbs
The maximum weight must not be exceeded.		

cockpit

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Check before launch

- Wing and tailplane connections checked?
- Full and free movement of controls?
- Parachute secured?
- Straps tight and locked?
- Pedals adjusted and locked?
- Brakes closed and locked?
- Trim correctly adjusted?
- Altimeter adjusted?
- Canopy locked?
- Cable on correct hook?

Beware: — Crosswind! — Cable break!

cockpit

Simple aerobatics manoeuvres

Recommended entry speed	km/hr	knots	mph
Loop	180	97	112
Stall turn	180	97	112
Chandelle	150	81	93
Lazy eight	120	65	75
Spins	—	—	—

Aerobatics with waterballast is not allowed.

Cockpit

TIRE: 2,5 bar (36psi)

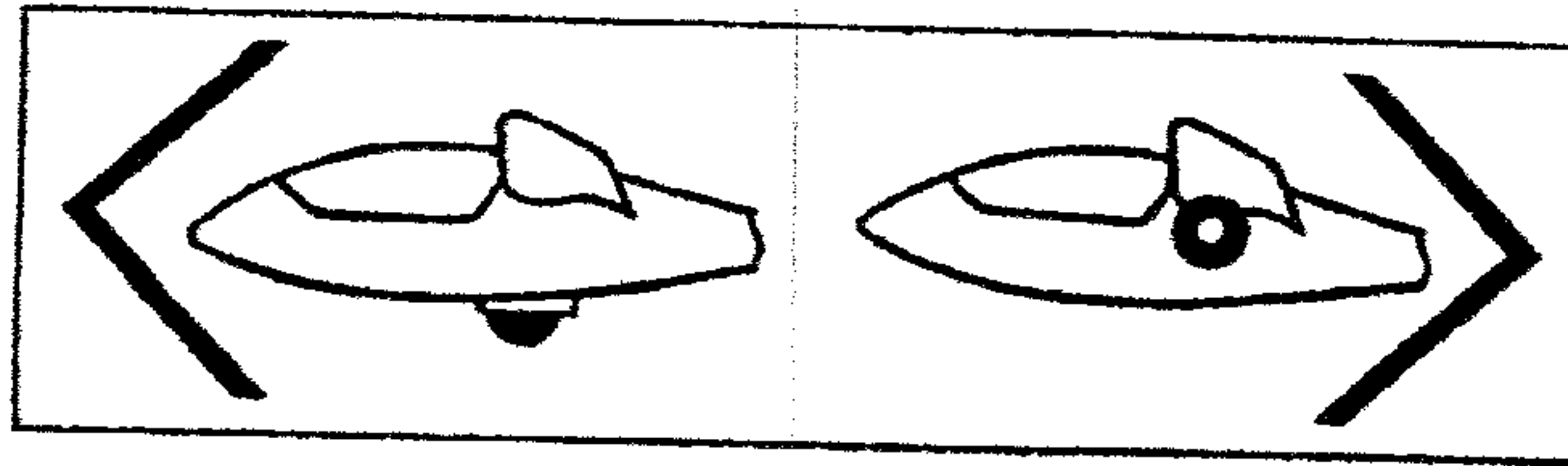
Nose and Tail wheel cover

**Weak links for towing
500 kp, 1100 lbs. max.
Tire: 2,5 bar 36 psi.**

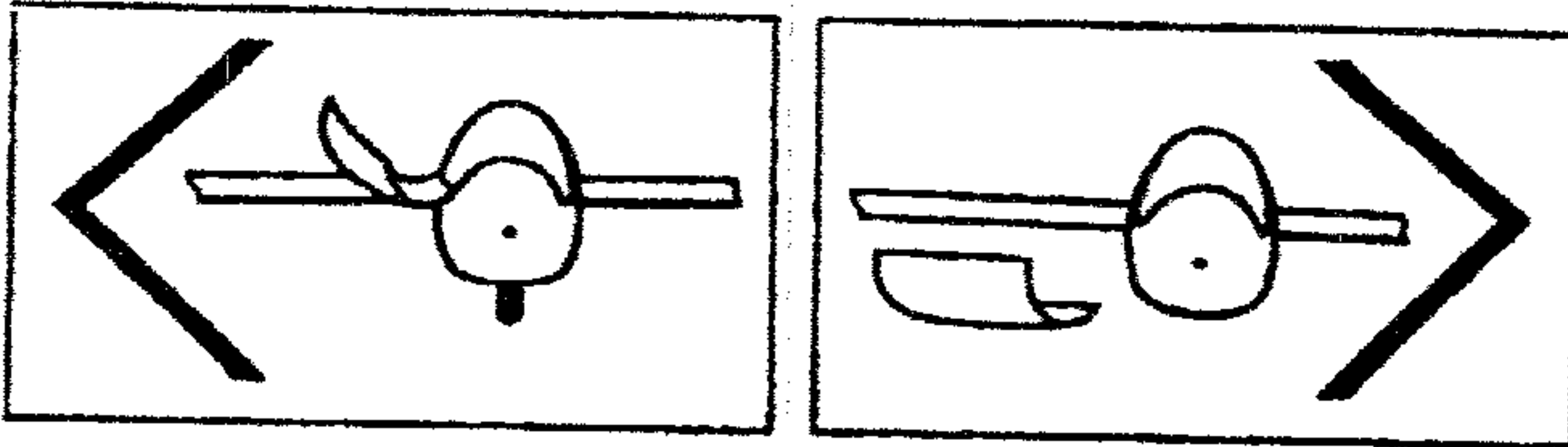
Main wheel cover

Altitude(ft)	0-6500	10000	13000	16500	19000
VNE (KIAS)	135	128	121	115	109

near airspeed indicator

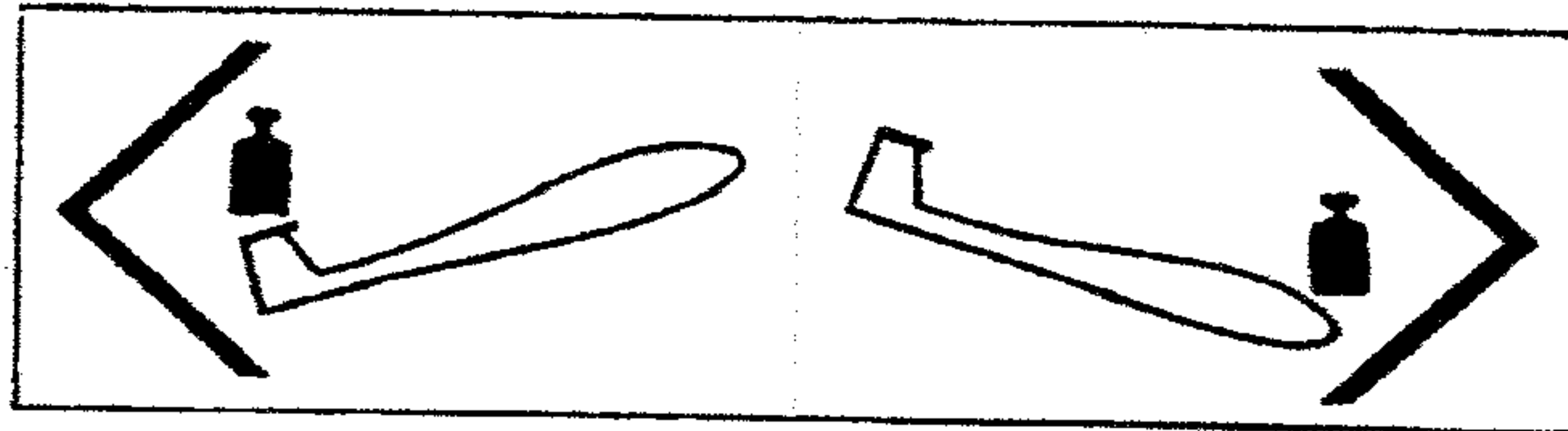


Undercarriage lever (only Stand. Astir III)

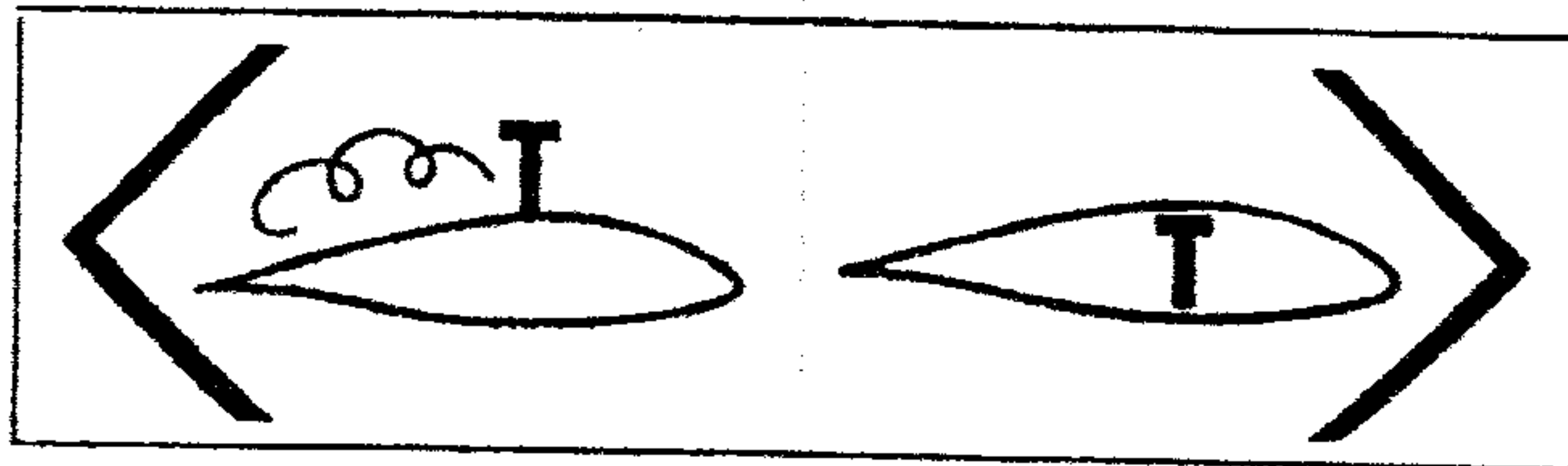


Left

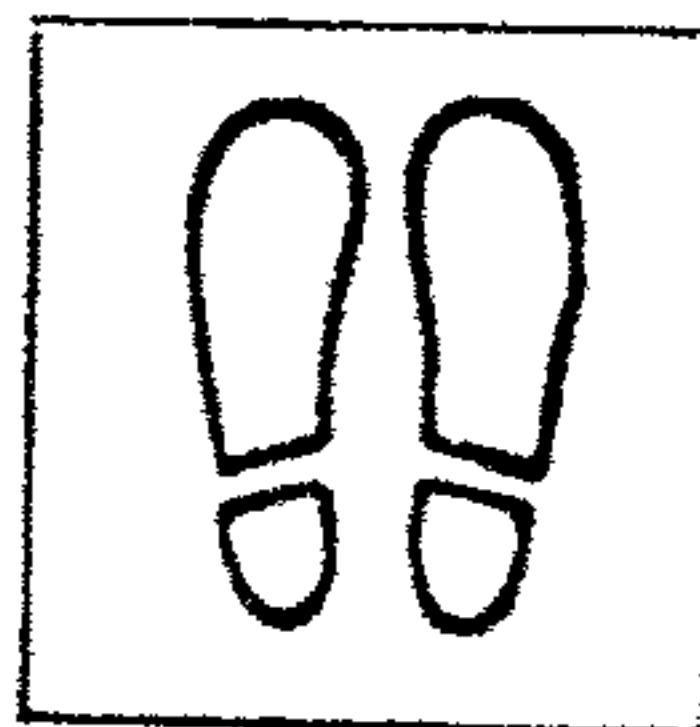
Canopy catch
Right side



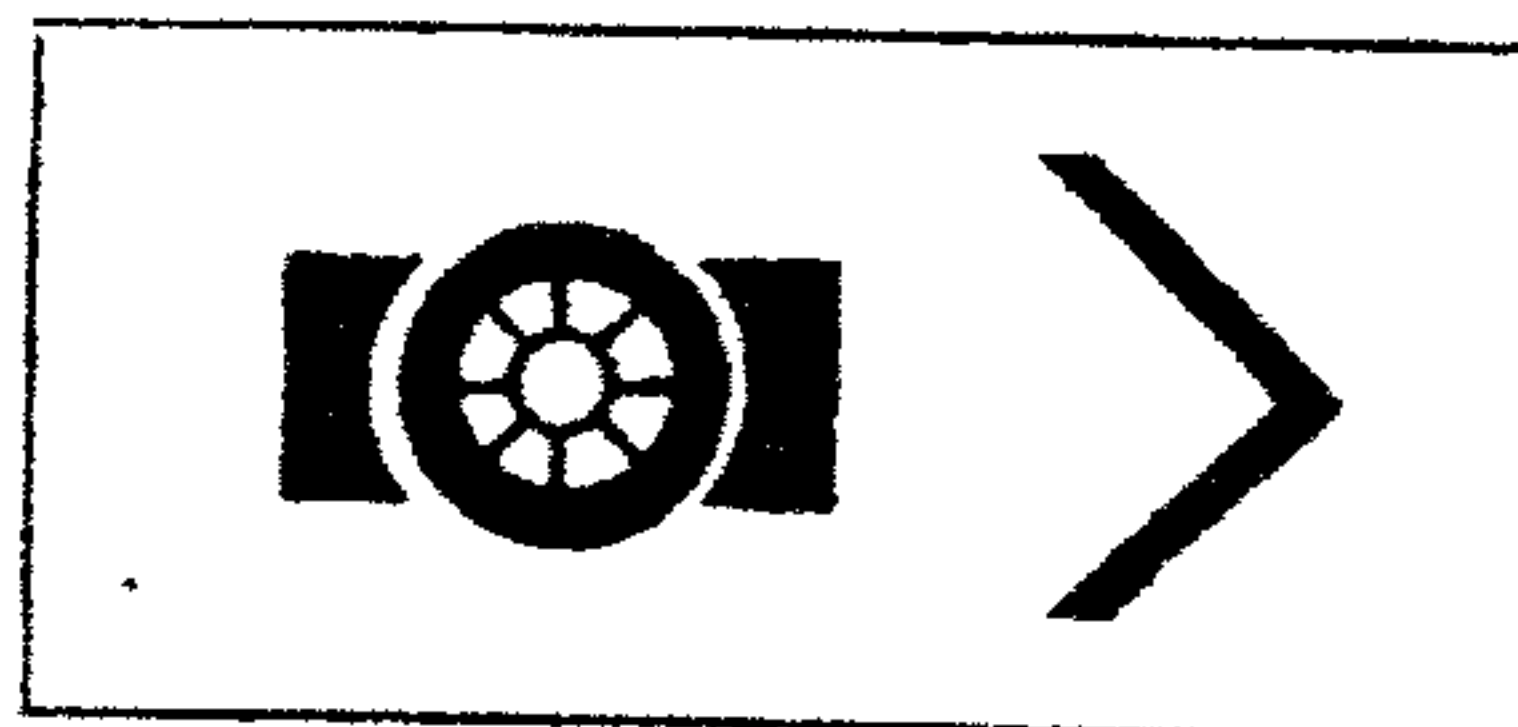
Trimmer green lever (left side of fuselage)



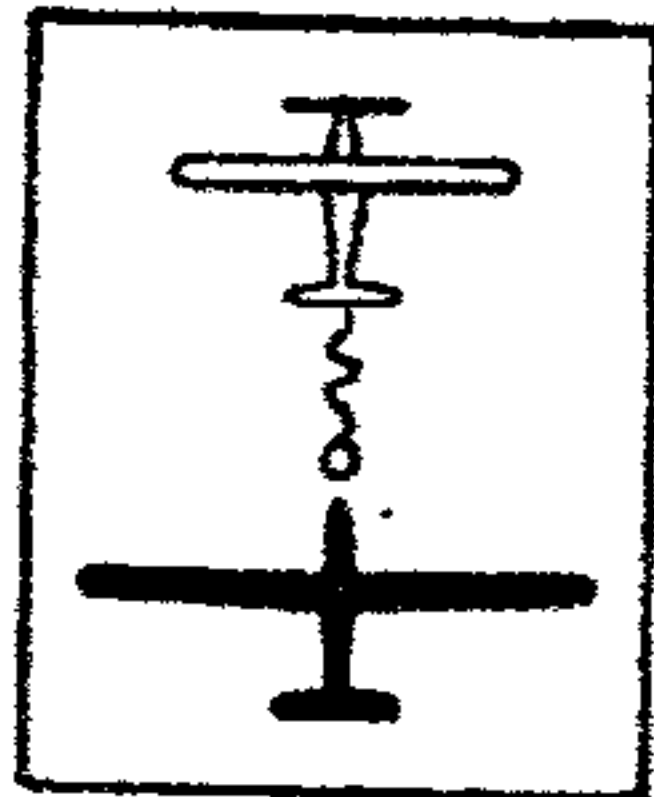
Airbrake lever



Rudder pedal adjustment (Instrument panel)



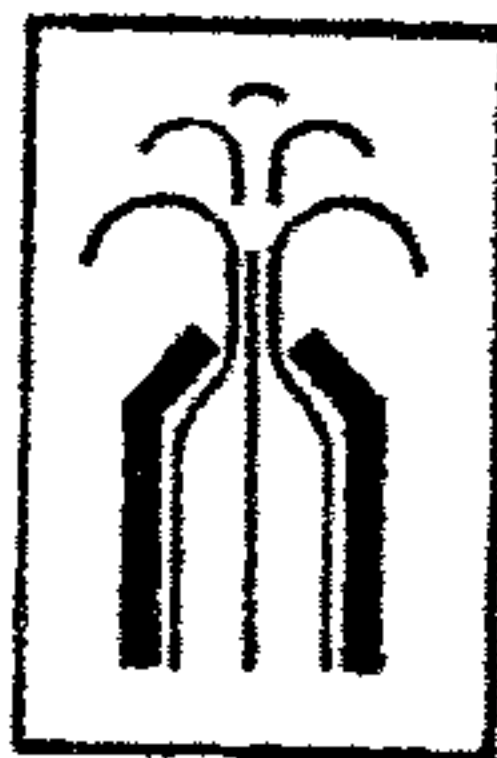
Wheel brake (Airbrake lever)



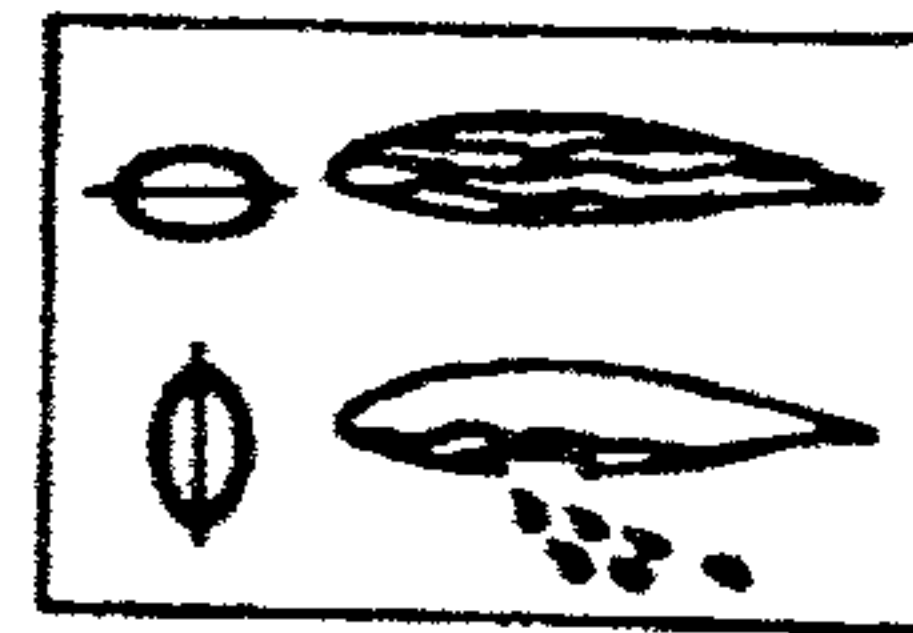
Baggage maximum
22 lbs 10 kg

(luggage compartment)

Cable Release
(Instrument panel)



Ventilation
(Instrument panel)



Water ballast jettison
(Instrument panel)
(Standard Astir III)

Don't push or
lift here

Fin
(both sides)

Elevator quick lock connected
Markings notice
Rotating knob turned in
Tailplane secured (cover closed)

Tailplane
checklist
(Fin)

For	N	90	60	E	120	180
Steer						
For	S	210	240	W	300	360
Steer						
DATE						

near magnetic
direction indicator

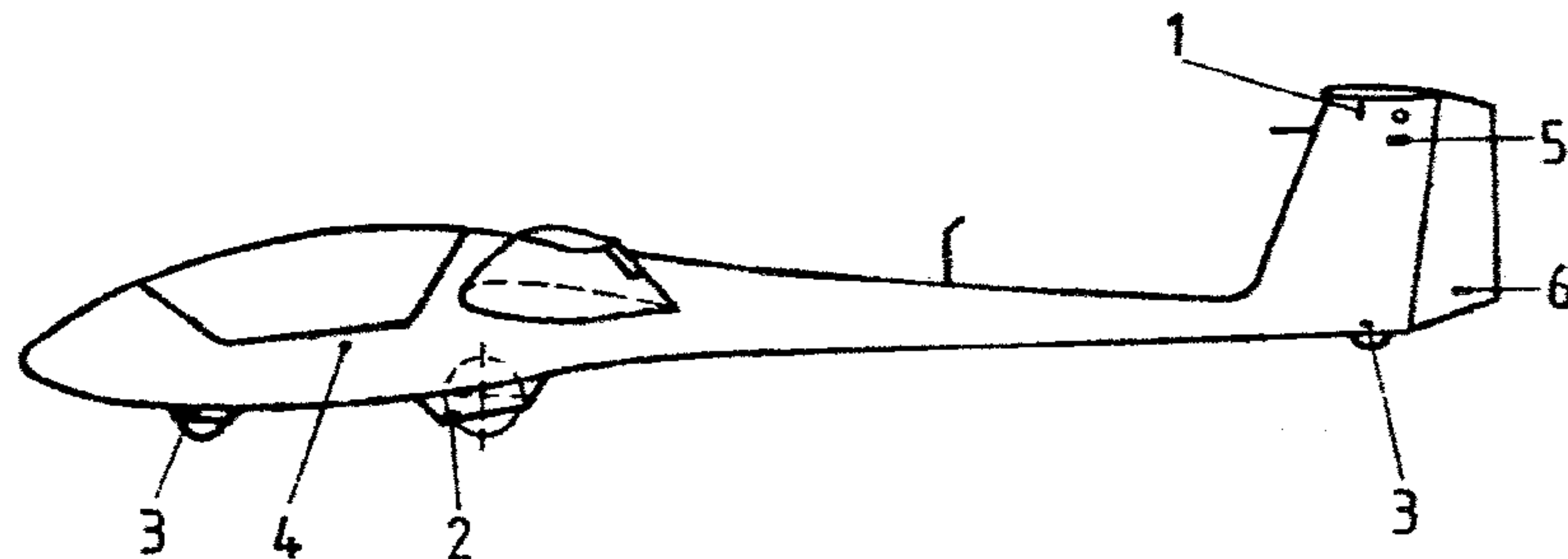
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Number of ballast weights		
Weight of pilot (parachute incl.)	55-69,9 kg	70-110 kg
Number of weights	1	0
1 ballast weight: 8,6 kg		

cockpit

Labels and Markings outside of the fuselage



- 1 Control Markings for the correct rigging of the tailplane
- 2 Label of Tire pressure and weak link strength
- 3 Label of Tire pressure
- 4 Red rings around static pressure port
- 5 Placard for elevator fastening
- 6 "Don't push or lift here"

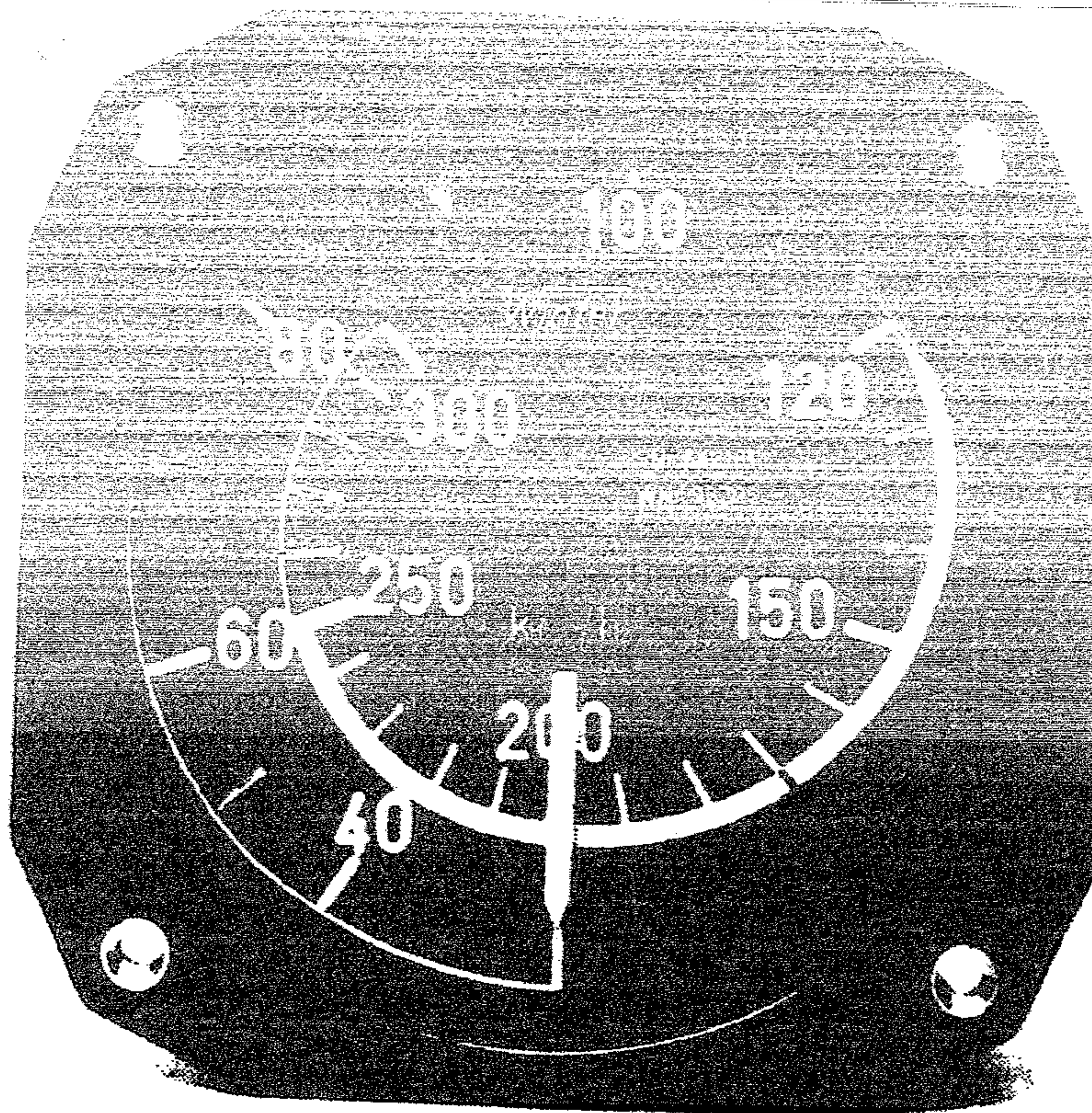
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Air Speed Indicator Markings

km/h	knots	mph	Marking	Significance
72-170	39-92	45-105	Green arc	Normal range of flying speed
170-250	92-135	105-155	Yellow arc	Range of flying speeds to be used with care
250	135	155	Radial Red line	Maximum speed (VNE)
90	49	56	Yellow triangle	Minimum recommended landing speed at maximum all up weight

72 km/h (39 kts / 45 mph) = V_{s1} under max. flight weight conditions



III. Emergency procedures

III.1 Spin recovery

Exit from spin can be accomplished by the standard recovery procedure:

- Full opposite Rudder
- Neutralize stick
- Ailerons should be neutral
- when rotation stops neutralize rudder and pull out gently.

III.2 Canopy jettison and exit

The freedom of movement in the cockpit makes exit easy in an emergency. The point to fix the parachute is the red ring on the central tube behind the seatback.

- a) Pull red knob back on the left and disengage the pin.
- b) Pull red knob back on the right and with the left hand push canopy upwards.
- c) Unbuckle seat harness.
- d) EXIT over left or right side.
- e) Wait only 1-3 seconds before pulling the rip cord.

