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FLIGHT MANUAL

MDM-1 „FOX”
MDM-1P „FOX P”

WITH WING TIPS

ISSUE IV / DECEMBER 1998

Factory Nº	
Registration Nº	

Pages identified by “Approved” are approved by **Civil Aircraft Inspection Board, POLAND**

Signature:

Stamp:

Original date of approval *February 24, 1999*

This glider is to be operated in compliance with information and limitations contained in this Manual.

This is translation of the original Polish text agreed with the Civil Aircraft Inspection Board, Poland

Translated by:
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0. ISSUANCES

0.1. RECORD OF REVISIONS

Any revision of the present Manual must be recorded in the following table. In case of approved Sections, they have to be 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 left-hand margin, and the Revision Number and the date will be shown in appropriate cells in the heading.

Note on organisation of the document: where used, indexed page No identifies: i, ii, ... - added new Manual page, not present in original issue

Revision Number	Affected Section	Affected Pages	Date of Issue	Approval	Date of Approval	Date inserted	Signature
1. *applicable only to gliders with electronic accelerometer installed*	0 2 7	2, 3A, 11A, 13A, 43A, 44A, 45A, 47A, 54A	10.10.2012		16.11.2012		
2.	0 9	4 51, 52, 53	09.01.2014		09.01.2014		
3. *removed pages 3A, 11A, 13A, 43A, 44A, 45A, 47A, 54A -inserted with previous revisions*	0 1 2 4 5 6 7 8	2, 3, 4, 5, 6, 6i, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17 22, 23, 24, 25, 26, 27, 28, 34, 35, 38, 39, 40, 40i, 41, 42, 43, 45, 46, 47, 48, 49, 50, 52 54	21.06.2019		21.06.2019		
4.	0 2 3 4 5	2, 3, 14, 15, 19, 20, 20i 26, 29, 30, 30i, 31, 32 35, 36 54	15.12.2020	EASA MC Appr No 10083362	28.11.2023		

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0.2. LIST OF EFFECTIVE PAGES

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Section	Page	Date of Issue	Section	Page	Date of Issue
0	1	December 1998	6	38	June 2019
	2	December 2020		39	June 2019
	3	December 2020		40	June 2019
	4	June 2019		40i	June 2019
1	5	June 2019	7	41	June 2019
	6	June 2019		42	June 2019
	6i	June 2019		43	June 2019
	7	June 2019		44	December 1998
	8	June 2019		45	June 2019
	9	June 2019		46	June 2019
	10	June 2019		47	June 2019
2	11	June 2019	8	48	June 2019
	Appr. 12	June 2019		49	June 2019
	Appr. 13	June 2019		50	June 2019
	Appr. 14	December 2020			
	Appr. 15	December 2020	9	51	January 2014
	Appr. 16	June 2019		52	June 2019
	Appr. 17	June 2019		53	January 2014
3	18	December 1998		54	December 2020
	Appr. 19	December 2020			
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	Appr. 20i	December 2020			
4	21	December 1998			
	Appr. 22	June 2019			
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	Appr. 24	June 2019			
	Appr. 25	June 2019			
	Appr. 26	December 2020			
	Appr. 27	June 2019			
	Appr. 28	June 2019			
	Appr. 29	December 2020			
	Appr. 30	December 2020			
	Appr. 30i	December 2020			
	Appr. 31	December 2020			
	Appr. 32	December 2020			
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	37	December 1998			

0.3. TABLE OF CONTENTS

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1. GENERAL

1.1. Introduction.

1.2. Certification basis.

1.3. Warnings, cautions and notes.

1.4. Glider description and technical data.

1.5. Three-view drawing.

1.1. Introduction.

3

This glider Flight Manual has been prepared to provide pilots and instructors with information for the safe and efficient operation of the glider in both: aerobatic MDM-1 „Fox” and utility MDM-1P „Fox P” versions.

This Manual includes the material required by JAR-22. It also contains supplemental data provided by the glider manufacturer.

Originally designed for aerobatics, the MDM-1 “Fox” is successfully used for both competition flying, as well as for initial and advanced training in aerobatics, to include unlimited aerobatics with a 2-person crew. This glider facilitates the safe and effective instruction of student pilot to every aerobatic maneuver and unusual attitude encountered in flying.

Over the project run, the original variant (MDM-1 “Fox”) has been modified to accommodate detachable wing-tips, permitting an extension of the wing span for non-aerobatic soaring flight. The new variant (MDM-1P “Fox-P”), permits easy in-field conversion between the Aerobatic and Utility versions by the simple exchange of short/long wing-tips.

The a.m. glider variants, differing in details explained below, have been defined and used in the formal process of design approval:

glider variant / project area	MDM-1 “Fox”	MDM-1P “Fox-P”
Design/ construction:	Short wing-tip permanently bonded to wing in the original manufacture.	Short or long wing-tips, interchangeably attached to the wing in a socket added to the original wing design.
Operational limitations:	Aerobatic Category; aerotow/winch-launch takeoffs.	Aerobatic Category (short wing-tips); aerotow/winch-launch takeoffs. Utility Category (long wing-tips); aerotow takeoffs only.

For operation practice however, important is to distinguish between the listed below glider versions (configurations) referred to later in this Manual:

AEROBATIC (short wing-tips/basic wing span), and

UTILITY (long wing-tips/extended wing span).

3 **1.2. Certification basis.**

This type of glider has been approved by airworthiness Authority (Civil Aircraft Inspection Board) in accordance with JAR-22, Change 4 of 7 May 1987, and with exemptions contained in Technical Data Sheet, Issue IV dated January 1999.

Type Certificate Nº BG-197 has been issued on 27 July 1994.

This glider has been classified to the following categories:

A - AEROBATIC - relates to glider version with basic wing span of 14,00 m {45,9 ft} intended for unlimited aerobatic manoeuvres.

U - UTILITY - relates to glider with wing span extended to 16,15 m {53,0 ft} intended for normal soaring flight and limited aerobatic manoeuvres.

3 **1.3. Warnings, cautions and notes.**

The following definitions apply to „WARNINGS”, „CAUTIONS” and „NOTES” used in this Flight Manual:

WARNING:	***means that the non-observation of the corresponding procedure leads to an immediate or important degradation of the flight safety.***

CAUTION:	***means that the non-observation of the corresponding procedure leads to a minor or to more or less long degradation of the flight safety.***

NOTE:	***draws the attention on any special operation item, not directly related to flight safety but which is important or unusual.***

3 **1.4. Glider description and technical data.**

MDM-1 „FOX” is a two-seat performance aerobatic glider, mid-wing layout with conventional tail arrangement. The structure is glass-epoxy and carbon-epoxy composite.

Wings:

Two-panel planform of considerable taper. Monospar structure with an auxiliary spar and sandwich type skin. Double C shaped spar. Monoplate air brake extended on wing upper surface only.

Large span, constant chord Friese-type ailerons, split in two panels, mass-balanced and suspended on 7 hinges.

Overlapping-type spar connection with two horizontal bolts extending up to rear fittings, connecting also wings to fuselage.

Fuselage:

Monocoque, sandwich structure with integral fin. Seat pans bonded permanently. Two-piece, side-hinged canopy opening sidewards to the right.

3 In fuselage nose the total pressure port and air intakes for air vent are provided, static pressure ports on the fuselage nose both sides.

Transceiver antenna installed in the fin.

Aero-towing hook installed in the front fuselage part.

Winch-launching hook installed in front of the main undercarriage.

Balancing weights are installed in front cockpit on both sides of the floor.

Pedals at front seat -adjustable with a grip (item 11 in Fig. 7.1.).

Back rest of front seat - adjustable by changing the position of back rest support (item 23 in Fig. 7.2.).

Tail unit:

Stabilizer, elevators and rudder of sandwich structure, control surfaces aerodynamically and mass balanced.

Control system:

3 Elevator and aileron control system - push rod type.

Rudder control system - cable type.

Air brake control system of push rod type (in wings) and - combined type (in fuselage).

The elevator control system is equipped with a spring type trimming device, operated with a lever at the control stick base, at front seat.

Undercarriage:

Faired, fixed undercarriage (with main and tail wheel). Hydraulic disc brake on the main wheel, actuation coupled with air brake.

Main technical data:

	Version			
	Aerobatic		Utility	
Wing span	14,00 m	45,9 ft	16,15 m	53,0 ft
Length (measured to rudder top edge)	7,38 m	24,2 ft	7,38 m	24,2 ft
Height (measured in flight attitude)	2,25 m	7,4 ft	2,25 m	7,4 ft
Wing dihedral	0 deg		0 deg	
Wing area	12,34 sqm	132,8 sqft	13,09 sqm	141,0 sqft
Aspect ratio	15,88		19,92	
Root chord	1,308 m	4,29 ft	1,308 m	4,29 ft
3 Mean Standard Chord (MSC) [1]	0,971 m	3,186 ft	0,938 m	3,077 ft
Wing profile	NACA 64_1 412		NACA 64_1 412	
Tailplane span	3,16 m	10,37 ft	3,16 m	10,37 ft
Tailplane area	1,873 sqm	20,2 sqft	1,873 sqm	20,2 sqft
Tailplane profile	NACA 63_1 012 ÷ 63006 mod		NACA 63_1 012 ÷ 63006 mod	
Fin and rudder area	1,123 sqm	12,0 sqft	1,123 sqm	12,0 sqft
Fin and rudder profile	NACA 63_2 015 ÷ 63_1 012		NACA 63_2 015 ÷ 63_1 012	
3 C.G. position (empty glider) (aft of Datum Plane(DP))	620÷645 mm	24,4÷25,4 in	620÷645 mm	24,4÷25,4 in
Nominal empty weight				
- without balancing weights	350,0 kG	772,0 lb	355,0 kG	783,0 lb
- with balancing weights (2 × 5,5 = 11,0 kG) {2 × 12,1 = 24,2 lb}	361,0 kG	796,0 lb	366,0 kG	807,0 lb

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(1) Mean Standard Chord (MSC) - chord of aerodynamically equivalent rectangular wing
(2) Datum Plane (DP) - vertical plane passing through the wing leading edge

	Version			
	Aerobatic		Utility	
Maximum weight of structural non-lifting parts - glider without wings	165,0 kG	364,0 lb	165,0 kG	364,0 lb
Maximum in-flight weight	530,0 kG	1168,0 lb	535,0 kG	1179,0 lb
C.G. position (in-flight) (aft of DP)	213÷379 mm	8,4÷14,9 in	213÷379 mm	8,4÷14,9 in
Position of load components				
- front instrument panel (fore of DP)	1.580 mm	62,2 in	1.580 mm	62,2 in
- balancing weights (fore of DP)	1.520 mm	59,8 in	1.520 mm	59,8 in
- pilot on front seat (fore of DP)	950 mm	37,4 in	950 mm	37,4 in
- rear instrument panel (fore of DP)	440 mm	17,3 in	440 mm	17,3 in
- pilot on rear seat (aft of DP)	60 mm	2,4 in	60 mm	2,4 in
- luggage	not allowed		not allowed	
Maximum wing surface loading	42,95 kG/sqm	8,80 lb/sqft	40,87 kG/sqm	8,37 lb/sqft
Limit manoeuvring load factors	+ 7,0 / - 5,0		+ 5,3 / - 2,65	
Limit manoeuvring load factors for solo flying (pilot weight ≤ 100 kG)	+ 9,0 / - 6,0		+ 5,3 / - 2,65	

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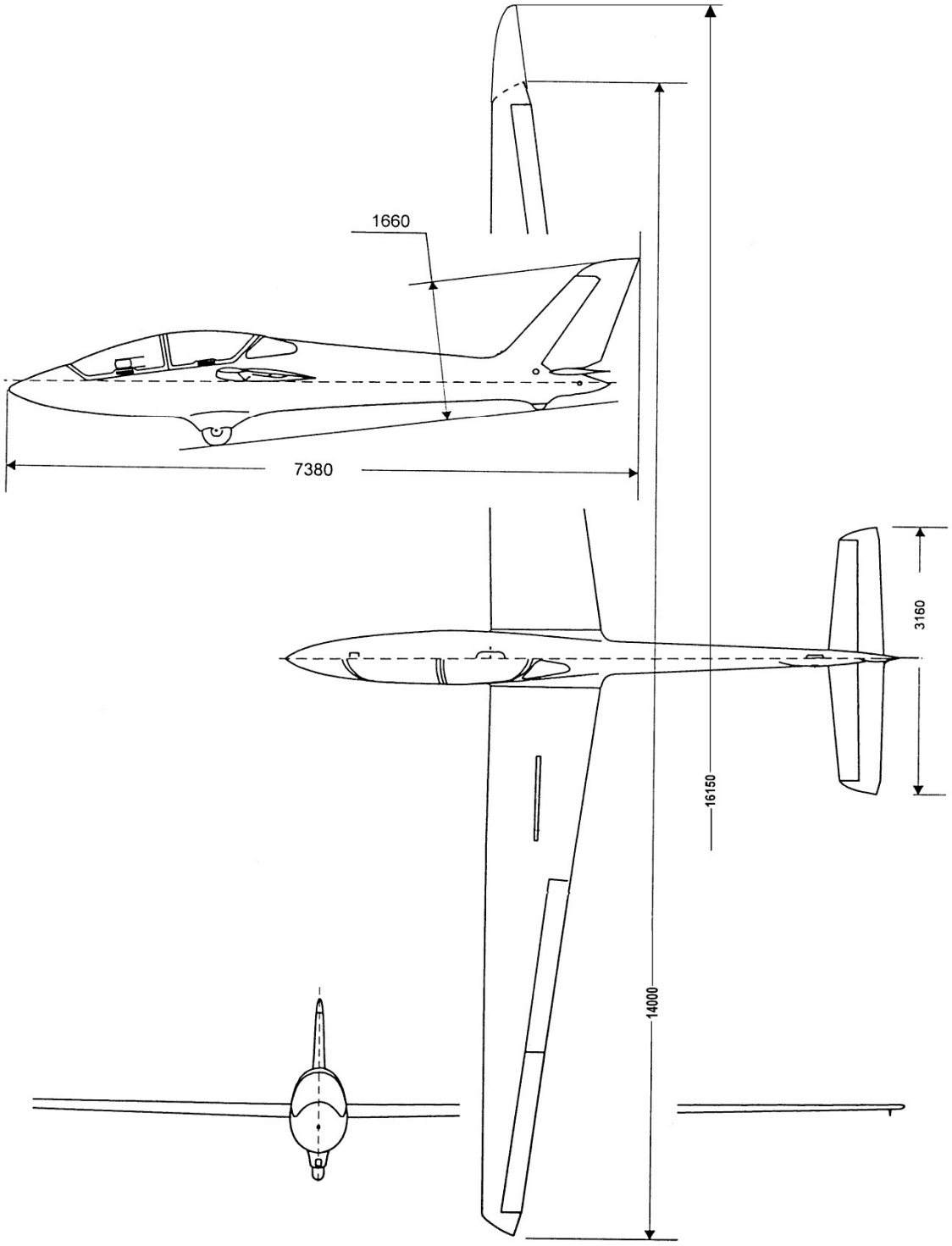
3 **1.5.** Three-view drawing



2. LIMITATIONS

2.1. Introduction.

2.2. Airspeed.

2.3. Airspeed indicator markings.

2.4. Power plant, fuel and oil. — NOT APPLICABLE

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3 **2.6. Weight.**

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2.11. Kinds of operation.

3 **2.12. Minimum equipment.**

2.13. Aerotow and winch launching.

2.14. Other limitations.

3 **2.15. Limitation placards**

2.1. Introduction.

3 Section 2 contains operating limitations, instrument markings and basic placards, necessary for safe operation of the glider, its systems and standard equipment.

The limitations contained in this Section and in Section 9 have been approved by Civil Aircraft Inspection Board.

2.2. Airspeed.

3 Airspeed limitations and their operational significance used in this Manual are shown below:

	Speed (IAS)	Version				Remarks
		Aerobatic		Utility		
		[km/h]	[kt]	[km/h]	[kt]	
V_{NE}	Never exceed speed	282	152	282	152	Do not exceed this speed in any operation; do not use more than $^1/_3$ of full control surfaces' deflection.
V_{RA}	Rough air speed	225	122	225	122	Do not exceed this speed except in smooth air and then only with caution. Examples of rough air are: lee-wave rotor, thunderclouds etc.
V_A	Manoeuvring speed	214	116	214	116	Do not make full or abrupt control deflections above this speed, since under certain conditions the glider may be overstressed by full control movement.
V_W	Max. winch-launching speed	150	81	—		Do not exceed this speed during winch-launching.
V_T	Max. aerotowing speed	150	81	150	81	Do not exceed this speed during aerotowing.

3 ***WARNING: In high altitude flight, the true airspeed (TAS) is higher than value indicated by airspeed indicator (IAS). To maintain the safe margin against the flutter limit related to true airspeed value, V_{NE} must be reduced with altitude to values specified in the following table.***

Flight altitude	***Never exceed speed V_{NE} IAS***	***Flight altitude***	***Never exceed speed V_{NE} IAS***
[m]	*[km/h]*	*[ft]*	*[kt]*
0-3000	282	0-10000	152
4000	267	13000	145
5000	253	16000	138
5500	246	18000	133

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2.3. Airspeed indicator markings.

3 Airspeed indicator markings and their colour-code significance are shown below.

Marking	IAS (value or range)		Significance
	[km/h]	[kt]	
Green arc	92÷225	50÷122	***Normal operating range*** Lower limit is 1,1 V_{S1} at max. weight and most forward C.G. Upper limit is Rough Air speed (V_{RA})[1].
Yellow arc	225÷282	122÷152	***Caution operation range*** Manoeuvres must be conducted with caution and in smooth air only. Upper limit is Never Exceed speed (V_{NE}).
Red radial line	282	152	Max. speed for all operations (V_{NE}).
Yellow triangle	115 [2]	62	Approach speed at max. weight.

2.4. Power plant, fuel and oil. — NOT APPLICABLE

2.5. Power plant instrument markings. — NOT APPLICABLE

3 [1] Leaving markings for the upper airspeed limit of the Normal Operating Range at V_A =214 km/h (116kt), i.e. at a value lower than allowed for the design V_{RA} =225 km/h (122kt), is considered conservative and accepted for gliders S/N up to 251 inclusive.

[2] Approach speed is 110 km/h for U version, while it is 115 km/h for A version {59 and 62 kts respectively}. However, in order to keep air speed indicator face legible, only the higher of these two values is marked on the instrument.

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2.6. Weight.

	Version			
	Aerobatic		Utility	
	[kG]	[lb]	[kG]	[lb]
Max. take-off & landing weight	530	1168	535	1179
Max. take-off & landing weight for the range of manoeuvring load factor extended to +9 / -6 g in solo flight	450	992	N/A	
Max empty weight without balancing weights	350	772	355	783
Max empty weight with balancing weights	361	796	366	807
Max. weight of structural non-lifting parts	165	364	165	364
Max. weight in baggage compartment	0	0	0	0

2.7. Centre of gravity.

		Version			
		Aerobatic		Utility	
C.G. range (in flight)	per cent of MSC[1]	22÷39		22÷39	
		[mm]	[in]	[mm]	[in]
	aft of DP[2]	213÷379	8,4÷14,9	213÷379	8,4÷14,9
C.G. range (empty glider)	aft of DP	620÷645	24,4÷25,4	620÷645	24,4÷25,4

2.8. Approved manoeuvres.

This glider is certified in both Aerobatic and Utility categories. Approved aerobatic manoeuvres for each glider Category, together with recommended entry airspeeds for particular manoeuvres are given in FM Section 4.

2.9. Manoeuvring load factors.

	Version	
	Aerobatic	Utility
Allowed load factors	+ 7,0 / - 5,0 g	+ 5,3 / - 2,65 g
Allowed load factors for solo flying, (pilot weight ≤ 100 kG (220 lb))	+ 9,0 / - 6,0 g	+ 5,3 / - 2,65 g
NOTE: ***above limitations apply to glider in a clean configuration, in a flight with air-brake extended +3,5 / 0,0 g***		

[1] Mean Standard Chord (MSC) - chord of aerodynamically equivalent rectangular wing
[2] Datum Plane (DP) - vertical plane passing through the wing leading edge

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2.10. Flight crew.

The crew consists of one or two persons.
Solo flying on front seat only.

2.11. Kinds of operation.

4 This glider is allowed for VFR flights, by day.

3 Flying in anticipated icing conditions and night flying — **PROHIBITED**.
Cloud flying — **ALLOWED**
provided pilot and glider meet National Regulations.

2.12. Minimum equipment.

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component & location	range of indication	remarks
Type of operation:	**normal (soaring) flight**	
airspeed indicator, *at front seat*	300 km/h (160 kts)	
altimeter, *at front seat*		
5-point safety harness, *at front-, and at rear seats*		
parachute or back cushion:, *for each crew member*		cushion thickness: 8 cm (3 in) for the front seat, 2 cm (1 in) for the rear seat
Type of operation:	**aerobatic flight** (in addition to the above)	
accelerometer, *at front seat*	9 /-6 g	
for dual aerobatic instruction, an accelerometer required in both instrument panels		

NOTE: ***The regulations in the country of registry may mandate the installation of additional equipment items (compass, transceiver, etc.) which must be complied with for the intended type of operation.***

2.13. Aerotow and winch-launching.

3

Aerotowing is allowed from the nose hook only.

Winch-launching is allowed from the C.G. hook only, and then only in Aerobatic version.

For aerotow, the nylon towing cable of 25÷60 m {80÷195 ft} length, with safety link of 677 daN {1525 lb} ± 10 per cent strength shall be used.

For winch-launching the cable with safety link of 677 daN {1525 lb} ± 10 per cent strength shall be used.

Max. aerotowing and winch launching speed is 150 km/h {81 kt}.

Autotow-launching — **PROHIBITED**.

2.14. Other limitations.

3 Cross-country flying, both free and aerotowed, in the Aerobatic version — with one-person crew only.

4 ***WARNING: Aerobatics in rough air is prohibited.***

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3 **2.15. Limitation placards.**

Following placards should be placed in visible place in the cockpit:

3

LIMITATIONS
1. Night flying - PROHIBITED. *2. Cloud flying - ALLOWED,* *provided pilot and glider meet National Regulations.* *3. Flying in anticipated icing - PROHIBITED.* *4. Aerobatics - ALLOWED,* *in accordance with Flight Manual, item 4.5.9.*

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SPEED LIMITATIONS		
IAS	*[km/h]*	*[kt]*
V_{NE}	*282*	*152*
V_{RA}	*225*	*122*
V_A	*214*	*116*
V_T	*150*	*81*

For aerotowing, from nose hook only,
use 25÷60 m (80÷195 ft) long nylon cable,
with safety link of 677 daN (1525 lb) ±10% strength

For winch-launching, from C.G. hook only,
and only in Aerobatic version, use cable
with safety link of 677 daN (1525 lb) ±10% strength

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BEFORE FLIGHT
• *Check cockpit for loose items* • *Check security of balancing weights* *(required for pilot under 70 kG /154 lb)* • *Adjust pedals and back rest (at front seat)* • *Fasten and tighten safety belts* • *Check access to all instruments and controls* • *Check full deflection of control surfaces, retract air brake* • *Set altimeter to zero reading* • *Set elevator trim to “nose-heavy”* • *Close and lock both canopies, perform communications check*

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LOADING PLAN

Pilot with parachute weight						*Balancing weights*		*Manoeuvring load limits*	
front seat				*rear seat*					
minimum		*maximum*						*Aerobatic*	*Utility*
[kG]	*[lb]*	*[kG]*	*[lb]*	*[kG]*	*[lb]*	*[kG]*	*[lb]*		
55	*121*	*89*	*196*	*0*	*0*	*2×5,5*	*2x12,1*	*+9 / -6 g*	*N/A*
70	*154*	*100*	*220*	*0*	*0*	*0*	*0*	*weight 450 kg max*	
55	*121*	*105*	*231*	*0*	*0*	*2×5,5*	*2x12,1*	*+7/ -5 g*	*+5,3/-2,65g*
70	*154*	*110*	*242*	*0*	*0*	*0*	*0*		
55	*121*	*110*	*242*	*70*	*154*	*0*	*0*		
55	*121*	*70*	*154*	*110*	*242*	*0*	*0*		

- *Solo flying on front seat only.*
- *Installation of balancing weights (2x5,5 kG/ 2x12,1 lb) acc. to FM item 7.2. and Fig 7.1*

3

Flight altitude	*[m]*	0-3000	4000	5000	5500
V_{NE}	*[km/h]*	282	267	253	246

Flight altitude	*[ft]*	0-10000	13000	16000	18000
V_{NE}	*[kt]*	152	145	138	133

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3. EMERGENCY PROCEDURES

3.1. Introduction.

3.2. Canopy jettison.

3.3. Bailing out.

3.4. Stall recovery.

3.5. Spin recovery.

3.6. Spiral dive recovery.

3.7. Power plant failure. **— NOT APPLICABLE**

3.8. Fire.

3.9. Other emergencies.

3.1. Introduction.

4 Section 3 provides checklist and amplified procedures for coping with emergencies that may occur.

3.2. Canopy jettison.

4 1. Pull back simultaneously with both hands the red lever on the right hand side of canopy and the canopy-opening lever on the left-hand side.
2. Push the canopy upwards and away, if necessary.

> ***WARNING:*** ***Both pieces of canopy cannot be jettisoned by one person. In case of training or passenger flight, each crew member should be familiarised with canopy jettison and bailing out procedures.***

3.3. Bailing out.

1. Jettison the canopy.
2. Release safety belts.
4 3. Grasp cockpit frame, pull up legs and bail out.
4. If the glider is gyrating (e.g. spinning), bail out towards the centre of rotation.

3.4. Stall recovery.

The glider, both in straight and in turning flight, provides clear stall warning in the form of perceptible vibrations, with sufficient margin prior to stall, as the critical angle of attack is approached.
Stall is characterised by a g-break (i.e. gentle nose-drop below the horizon). Ailerons control remains efficient up to stall.
Altitude loss in a wing-level stall is 20÷30 m {65÷100 ft}.
With control stick pulled completely aft and lateral control maintained with ailerons, the glider enters a deep stall condition with considerable sink rate (approx. 9 m/s {1800 ft/min}).
Recovery from a deep stall condition is straightforward and immediate by pushing the control stick slightly forward of neutral, or by releasing the controls.

Adding the wing tips does not change the stall characteristics of the glider.

> ***NOTE:*** ***A high speed stall can be induced at any airspeed by abrupt application of up-elevator. High speed stall with rudder deflected will result in a flick towards the rudder and entering a spin, if not recovered in time.***

> ***WARNING:*** ***If the glider is stalled at low altitude, pulling out too early or too hard will result in a secondary stall and eventual spin close to the ground.***

3.5. Spin recovery.

4

Spinning characteristics of the FOX are not critical. It must be kept in mind however, that the position of the centre of gravity (C.G.) affects considerably both stalling and spinning of the glider. With C.G. approaching the aftmost limit, stall becomes more pronounced and spin recovery may be more difficult. It is highly recommended for a light pilot to establish a slightly forward C.G. by using the ballast weights.

Spin entry from a stall at low airspeed and level flight results in a nose-low attitude and moderate rate of rotation. The spin, at least during the first few turns, is unstable. Oscillations both in pitch and rotational speed are common. During the second turn, the autorotation accelerates and the nose rises momentarily. In this phase, recovery may be slightly delayed. Even under these conditions, the delay in spin recovery does not exceed one turn.

Dynamic spin entry from higher airspeed and higher G will result in a spin with nose-high attitude and rapid high rate rotation. Due to the high angle of attack and high energy of gyration, this kind of spin can only be recovered after multiple turns, when the rotational speed decreases and the nose starts to drop. Altitude loss in this manoeuvre is considerable! It mostly occurs when in a positive flick the control stick is pulled too far back or back-stick is released too late.

Aileron deflection in the direction of spin will result in nose rise and flattening of the spin. In this situation recovery may not be possible before the nose is lowered again by neutralising the ailerons.

This “flattened spin” must not be confused with a “true flat spin” caused by C.G. position too far aft. The latter form of spin may be non-recoverable. Extending the air-brake and shifting the front pilot forward in the seat (e.g. by loosening the shoulder harness and leaning forward as far as possible) may help to recover.

Neutralising the rudder before rotation stops may accelerate rotation and result in additional loss of altitude.

Recovery from normal spin	Recovery from flat spin
1. Full rudder opposite to rotation	1. Aileron neutral
2. Push control stick to slightly forward of neutral	2. Full rudder opposite to direction of rotation
3. Neutralise rudder when rotation stops	3. Push control stick forward, short of the forward travel stop *!! maintain recovery controls until rotational energy is dissipated and nose drops after couple of turns !!*
4. Pull out from the ensuing dive	4. Rudder neutral when rotation stops
	5. Pull out from dive
	NOTE: • *extending the air brake* • *shifting the front pilot forward to move C.G. forward (after loosening of shoulder belts)* *may help in recovering from flat spin*

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NOTE: ***Deflecting the ailerons opposite to the direction of spin results in a transition from spin to spiral dive.***

Mounting long wing-tips does not change the spinning characteristics of the glider.

WARNING: ***Be aware that in some cases a parachute jump remains the sole and obligatory rescue measure – then follow the procedures given in items 3.2, 3.3 above.***

3.6. Spiral dive recovery.

Upright	Inverted
1. Roll wings level.	1. Roll upright (*stick towards the sky!*).
2. Rudder neutral.	2. Rudder neutral.
3. Pull out of dive.	3. Pull out of dive.

3.7. Power plant failure. — NOT APPLICABLE

3.8. Fire. — NOT EXPECTED

3.9. Other emergencies.

SAFETY RECOMMENDATIONS

Be aware that the FOX model is designed for competition aerobatics at the highest level. Therefore, flight controls are highly effective. Overly aggressive control inputs, especially in elevator, may result in extreme attitude and rapid auto-rotation with severe loss of altitude. Stopping figures (stall turn, tailslide), flick rolls and spins may result in momentary loss of control and consequently inordinate loss of altitude. Therefore, such manoeuvres should always be practiced at a safe height. In design of aerobatic sequences this fact should be kept in mind and such figures placed near the top of the sequence.

To improve flight safety, the following rules are recommended in operation of FOX glider:

- limit max speed for vertical auto-rotation manoeuvres to 145 km/h IAS
- avoid positive autorotation manoeuvres below 700 m AGL
- for the role of Pilot-In-Command in aerobatic flight with 2-person crew, a minimum experience of 50 flight hours in the FOX glider is recommended.

4. NORMAL PROCEDURES

4.1. Introduction.

4.2. Rigging and de-rigging.

4.3. Daily inspection.

4.4. Pre-flight inspection.

4.5. Normal procedures and recommended speeds.

4.5.1. Launch, take-off run and ground rolling.

4.5.2. Take-off and climb.

4.5.3. Flight.

4.5.4. Approach.

4.5.5. Landing.

4.5.6. Flight with water ballast. **— NOT APPLICABLE**

4.5.7. High altitude flight.

4.5.8. Flight in rain.

4.5.9. Aerobatics.

4.1. Introduction.

Section 4 provides the procedures for the conduct of normal operation. Normal procedures associated with optional equipment can be found in Section 9.

4.2. Rigging and de-rigging.

3 Four persons with basic technical skill are required to perform glider de-rigging after an off-field landing. Before starting the de-rigging process of particular assembly, all participants should be informed in details on the procedure to be carried out.

Tools necessary:
- open end spanner 17 mm,
- spanner 10 mm,
- pliers,
- assembly wrench (steel rod ∅15×400 mm) with duralumin tip for alignment of main fittings (supplied with glider).

The de-rigged assemblies should be stored directly on the trailer. In case a trailer is not at hand, wings and tailplane may be temporarily laid on grass, after ensuring no protruding stones or other hard objects are present.

DO NOT PUT THE BOLTS AND SCREWS IN CONTACT WITH THE GROUND.

Assemblies should be de-rigged in the following sequence.

3

4.2.1. De-rigging the tailplane.

Two persons are necessary.

- The glider is supported on the wing.
- Set the spring of trimming device back onto stop, control stick free, rudder deflected to either side.
- Remove the safety pin, unscrew nut and remove the tailplane main bolt (at the nose portion of stabilizer in its plane of symmetry).
- Push the stabilizer backwards at the leading edge until the stabilizer front fitting disengages from the sleeves. Then, holding stabiliser on both sides and allowing both elevators to drop down, shift the tailplane backwards. The control system disconnects automatically.
- Insert the main bolt back into fittings in fuselage, screw on the nut initially and insert the safety pin (to protect against loss).
- Put the stabilizer on the trailer or other suitable location.

4.2.2. De-rigging the wing-tips.

One person is necessary.

- Support glider on a wing or put wing on a trestle.
- Remove pin from castellated nut.
- Unscrew the nut of fitting screw.
- Remove the screw.
- Disassemble the wing-tip.
- Prevent the screw, pin and nut from being lost.

4.2.3. De-rigging the wings.

Two persons hold the glider at wing tips in a horizontal position.

- Remove the safety pins. Unlock the main bolts by rotating downwards the safety locks that prevent the bolts from shifting -off. Safety pins and locks are located at the main bolts front face with access from the cockpit.
- Insert steel pin of assembly wrench into the whole in the main bolt base.
- Unload the bolt by lifting the wing tip slightly and remove the bolt with advance-rotary motion. Repeat this procedure with the other bolt.
- Lift one wing at its root, holding it at the leading edge and at the vicinity of rear fitting as well as at the tip. Shove the wing out of the fuselage. The aileron and airbrake control system of the de-rigged wing will disconnect automatically. One person should firmly hold the opposite wing at the tip.
- Shove the wing out of the fuselage.
- Remove the second wing in the same way. One person should hold the fuselage at the fin or at cockpit side rim to secure it against tipping over.
- The main bolts should be inserted back into the fuselage main fittings and secured by rotating the safety device upwards into vertical position (to avoid losing the bolts).

4.2.4. Final remarks.

The rigging of the glider requires the reverse sequence, preferably with 5 persons. All mating surfaces, main bolts and sleeves should be dried and re-greased.

The Utility version glider is provided with the long wing-tips extending the wing span, whereas in Aerobatic version the short wing-tips are closing the outline of the wing.

NOTE:	***Glider rigging should be supervised by a rigger, acquainted with servicing a glider of this type.***

Approved

4.3. Daily inspection.

Check:

3 1. Glider’s documents (verify and complete the required entries).

2. External inspection, structure integrity and surface condition.

3. Securing of connecting elements and coupling in control systems. Locking of main bolts in wing and tailplane fittings, and control systems, where accessible, condition of, and play in connection at wing-tip fitting.

4. Correct operation of control systems.

5. Operation of towing hooks.

6. Condition of undercarriage, wheels rollability and operation of wheel brake.

3 7. Air pressure in tyres (visually), cleanliness of undercarriage well.

8. Pilot’s safety harness.

3 ***CAUTION: The spring of belt clamp must neither be bent nor broken.***

9. External condition of static and total pressure ports.

10. Correct operation of board instruments and battery condition.

11. Condition of pedals and possibility of their adjustment.

3 12. Operation of valve in air-vent system. This is visible through the nozzle on fuselage nose.

13. Condition of canopy, locks and jettison system.

14. Presence and correct installation of balancing weights.

15. Transceiver — communication test.

3 ***WARNING: When leaving the glider in the airfield on a sunny day, the canopy perspex should be necessarily protected with a cover, to avoid self-ignition of cockpit elements due to the focusing effect of the canopy !!!***

Approved

4.4. Pre-flight inspection.

3

1. Check securing of connecting elements and coupling in control systems, in accordance with item 4.3.3.
2. Remove or fasten loose items in the cockpit, check reliable installation of balancing weights (if present).
3. Put on the parachute.
4. Adjust the cockpit elements for comfortable position (pedals, back rest, cushions).
5. Take a seat in the cockpit, fasten the safety harness.
6. Ensure access to all devices.
7. Check full movement of controls.
8. Ensure the air brake is locked in retracted position.
9. Set the altimeter to „zero” reading.
10. Set the elevator trim to „nose heavy” position.
11. Close and correctly lock the canopy.
12. Connect the towing cable, check a reliable connection.
13. Make a communication test.

4.5. Normal procedures and recommended speeds.

4.5.1. Launch, take-off run and ground roll.

1. Towing cable connection.

3

– Pull the release handle onto stop.

– Insert the small ring of cable end into the hook and release the handle.

CHECK THE RELIABLE CABLE CONNECTION BY PULLING ON THE CABLE SEVERAL TIMES !!!

3 2. Winch launching — ON C.G. HOOK ONLY, AND WITHOUT THE LONG WING-TIPS !!!

- Prior to take-off inform the winch operator that the increased launching speed must be maintained, as for gliders with water ballast.
- Before take-off, set the trimming device at:

  1st slot (counting from front) — for light pilot in solo flight,

  4th slot (counting from front) — for two person crew.
- During the take-off run, maintain the control stick neutral until lift-off.

4 ***CAUTION: Do not attempt to force an early lift-off with elevator.***

3
- When airborne, having gained the proper speed, the glider can gently pass into climbing.
- In case of hitching a ground with the wing, release towing cable immediately.
- Recommended steep climbing airspeed is 110÷120 km/h {59÷65 kt}.
- Before releasing the towing cable, the pilot should slightly unload the cable by pushing forward on the stick.

4 ***NOTE: In case the cable exceeds an 80° angle, an automatic release will occur.***

3
- After releasing the cable, pull on the release handle in cockpit several times and then pass into gliding.

4 ***CAUTION: Do not change the elevator trim setting during the climb.***

3 3. Aerotowed take-off — ON NOSE HOOK ONLY!!!

- When tensioning the tow cable, brake on the wheel. This prevents rolling the wheel over the cable. In case of surge and slackening of the tow cable, release it immediately.
- Take-off run with control stick pushed forward is recommended, to lift the tail as soon as possible.
- Should the wing touch the ground, release the cable immediately.

Approved

3 4.5.2. Take-off and climb.

- After establishing the aerotow airspeed, neutralise control stick forces with elevator trim.
- The low-tow position behind the tow plane is not recommended due to cable rubbing against fuselage surface.

4.5.3. Flight.

3 The glider controllability in free flight is correct, control surfaces deflections are proportional and control forces are low.

Stall warning, in the form of perceptible vibrations, appears approximately 4÷5 km/h {2÷3 kt} before the stall.

The air brake can be operated up to V_{NE}. At speed above 200 km/h {108 kt}, extend the air brake gently as pilot may be subjected to the forward surge (braking effect).

Extending the air brake results in strong buffeting at tailplane, increasing in line with airspeed. This, however, does not present a problem for piloting the glider.

In aquatinting flights on this type, pay attention to high forces of air brakes rectration, at airspeeds above 200 km/h {108 kt}, and to strong braking effect.

In thermal and soaring flights, the careful piloting and attention are necessary due to a small margin between stall warning and stall speed.

Flight in thunder conditions conducive to lightning should be avoided.

4.5.4. Approach.

3 Approach at 115 km/h {62 kt} airspeed. In rough air or in rain, at 125 km/h {67 kt}. Extending the air brake incurs a nose-down pitching, which requires compensation with aft stick input .

Efficiency of air brakes allows for precise adjustment of approach path angle.

Approved

4.5.5. Landing.

Due to lack of shock absorber, land on selected smooth part of airfield.

3 Touch down simultaneously with main and tail wheel. Due to coupling between air brake and wheel brake actuation, avoid touching ground with fully extended air brake.

Avoid hard wheel braking. During landing roll-out, hold the control stick completely aft, as the glider has tendency to pitch nose down.

4.5.6. Flight with water ballast. **— NOT APPLICABLE**

4.5.7. High altitude flight.

3 Due to the lack of integral oxygen equipment, high altitude flights are only allowed up to 3000 m {9840 ft} pressure altitude (unless supplemental oxygen is carried and used on the glider).

Remember to reduce the V_{NE} with altitude, as per instruction in FM item 2.2 Airspeed, to ensure safe margin against flutter critical speed.

4.5.8. Flight in rain.

3 Flight in rain results neither in considerable deterioration of glider performance, nor in changes of its piloting characteristics.

In circling and in approach, maintain the airspeed increased by approximately 5 km/h {2,5 kt}. In poor visibility, or in case of perspex fogging, open the side window and the cockpit air-vent.

A glider considerably wetted by rain should by wiped with a flannel cloth and allowed to dry with air brake extended.

3

After flying in rain complete the following:

- Drain water from drainage- units by removing drain plugs.
- Disconnect the total- and static pressure ducts.
- Disconnect the instruments and blow out the ducts with compressed air, if necessary.
- Having the ducts dried, re-connect the system and perform a leak-check.

The following day, the glider should be de-rigged, and the fittings and bolts greased.

Approved

4.5.9. Aerobatics.

Before aerobatics:

4

- Tighten pilot’s safety harness and check securing of its locks.
- Ensure the air brakes are closed and locked,.
- Reset the G-meter,
- Set the elevator trim for approx.. 150 km/h {80 kts}

(do not change trim setting during manoeuvres)

Be aware that FOX is a high-performance aerobatic glider. Performing aerobatics safely in this glider requires expert guidance instruction. Any aerobatic manoeuvres should initially be trained dual with qualified instructor.

Practising solo, always have a competent observer on the ground to comment and critique your flying. Remember, in competition counts only what the judges on the ground see, not what you see from the cockpit !

Stopping figures (stall turn, tail-slide) and flicks may result in momentary loss of control and considerable loss of altitude. Such figures should never be attempted below a safe height (initially not below ca. 700 m (2500 ft) AGL). Minimum height may only be lowered when the pilot is thoroughly familiar with the glider.

The glider Aerobatic version is capable of the manoeuvres listed in Table 1, whereas Utility version is limited to manoeuvres listed in Table 2.

Recommended entry airspeeds for aerobatic manoeuvres – see Table 1, Table 2 as appropriate for the glider version.

To avoid overstressing the glider and possible loss of control, do not exceed given maximum entry speed for flick rolls on descending line.

WARNING: ***Aerobatics in rough air is prohibited.***

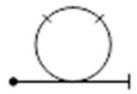
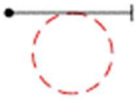
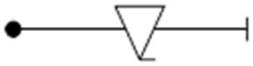
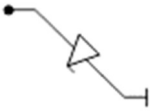
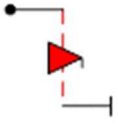
NOTE: ***Rear C.G. position causes elevator control to become more sensitive , increasing risk of over-G, making stall/ spin recovery more demanding.***

CAUTION: ***In tailslide, always hold the stick with both hands and before the glider stops block stick and rudder pedals firmly. Failing to do so may cause severe damage to controls during the slide.***

NOTE: ***In case of control stick being snatched away in prolonged tail-slide, inspect the glider acc. to Technical Service Manual, item 3.4, Table 3.***

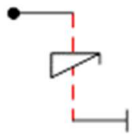
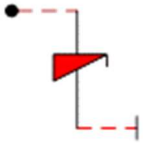
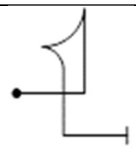
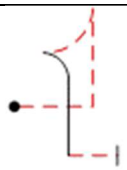
Table 1. Allowed aerobatic manoeuvres (AEROBATIC VERSION).

4

Item	***Manoeuvre***	***Aresti catalogue symbol***	***(IAS) Entry airspeed km/h (kt)***	***Average load factor***
1.	Positive loop		190÷210 (*103÷113*)	4,0
2.	Negative loop upwards (from inverted flight)		240÷260 *(130÷140)*	- 4,0
3.	Negative loop downwards		100 ÷110 (*54 ÷59*)	- 4,5
4.	Normal stall turn		200 ÷230 *(108÷124)*	4,0
5.	Inverted stall turn		230 ÷250 *(124÷135)*	- 4,0
6.	Aileron (slow) roll		180 min *(97 min.)*	
7.	Positive flick roll		160 ÷170 *(86÷92)*	3,5 ÷ 4,5
8.	Negative flick roll		160 ÷170 *(86÷92)*	-3,0 ÷ -3,5
9.	Positive flick roll on descending line		130 ÷145 max.	3,0 ÷ 3.5
10.	Negative flick roll on descending line		130 ÷145 max. *(70 ÷78)*	-3.0 ÷ -3,5
11.	Positive flick roll vertically down		120 ÷145 max. *(65 ÷78)*	3,0 ÷ 4,0
12.	Negative flick roll vertically down		130 ÷140 max. *(70 ÷76)*	-2,8 ÷ -3,5

Approved

4

Item	*Manoeuvre*	*Aresti catalogue symbol*	*(IAS) Entry airspeed km/h (kt)*	*Average load factor*
13.	Upright spin		min.	up to 3,5
14.	Inverted spin		min.	up to -3,5
15.	Positive tail-slide (not longer than 2 sec.)		200 ÷230 *(108 ÷124)*	4,0
16.	Negative tail-slide (not longer than 2 sec.)		230 ÷250 *(124 ÷135)*	-4,0

Approved

Table 2. Allowed aerobatic manoeuvres (UTILITY VERSION).

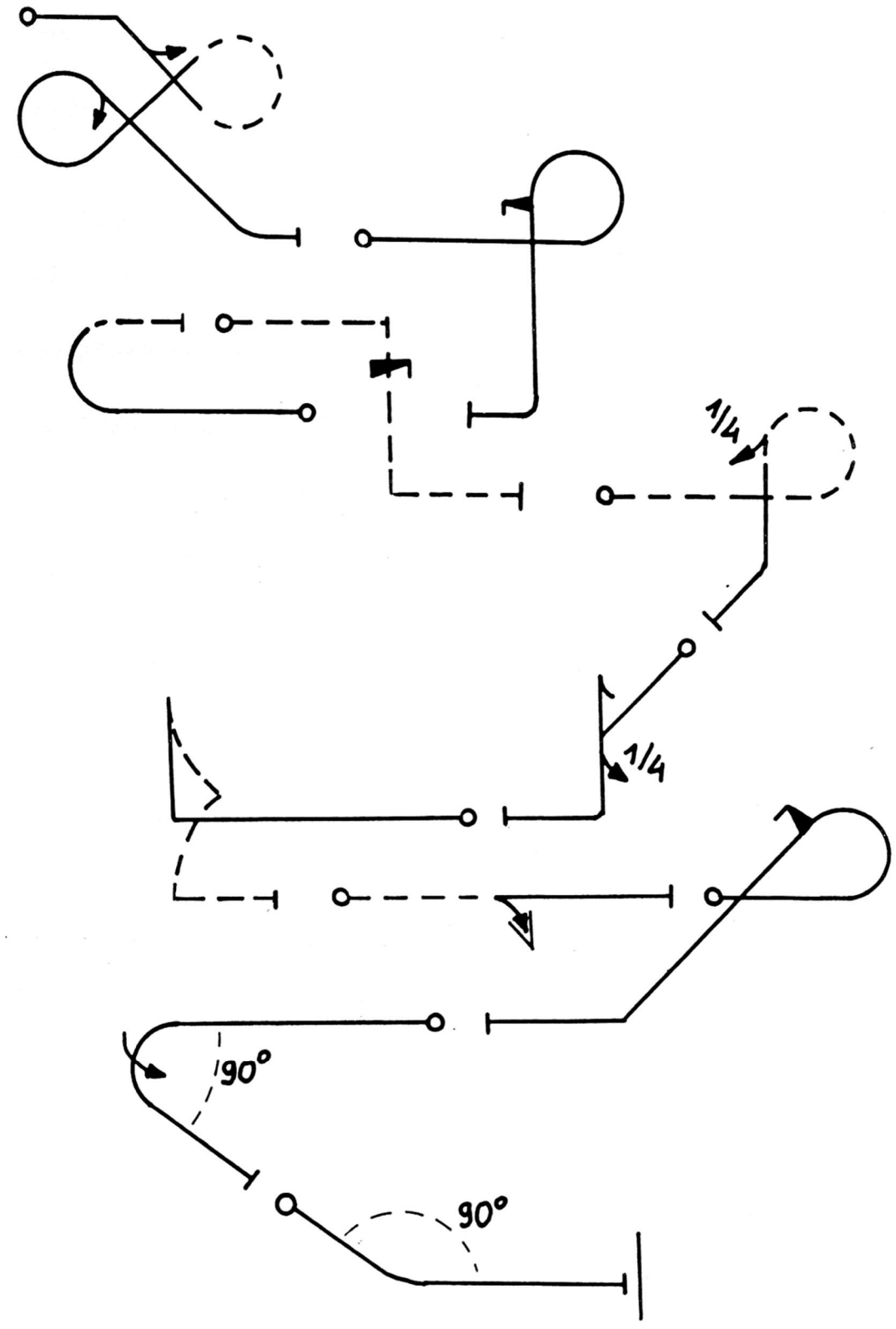
4

Item	***Manoeuvre***	***Aresti catalogue symbol***	***(IAS) Entry airspeed km/h (kt)***	***Average load factor***
1.	Upright spin		min.	~3,5
2.	Positive loop		190÷210 (*103÷113*)	4,0
3.	Normal stall turn		200 ÷230 *(108÷124)*	4,0
4.	Lazy eight		170 ÷ 200 (92 ÷ *108)*	~2,0
5.	Chandelle		~210 *(~114)*	4,0
6.	Steep turn		180 *(97)*	-

Approved

Example of competition program

4 The altitude loss for this program in smooth air should not exceed 900 m {2950 ft}.



5. PERFORMANCE

5.1. Introduction.

5.2. Approved data.

5.2.1. Airspeed indicator system calibration.

5.2.2. Stall speeds.

5.2.3. Take-off performance. — **NOT APPLICABLE**

5.2.4. Additional information.

5.3. Other, non-approved information.

5.3.1. Demonstrated cross-wind performance.

5.3.2. Flight polar.

5.1. Introduction.

Section 5 provides approved data for airspeed calibration, stall speeds and take-off performance as well as non-approved further information.

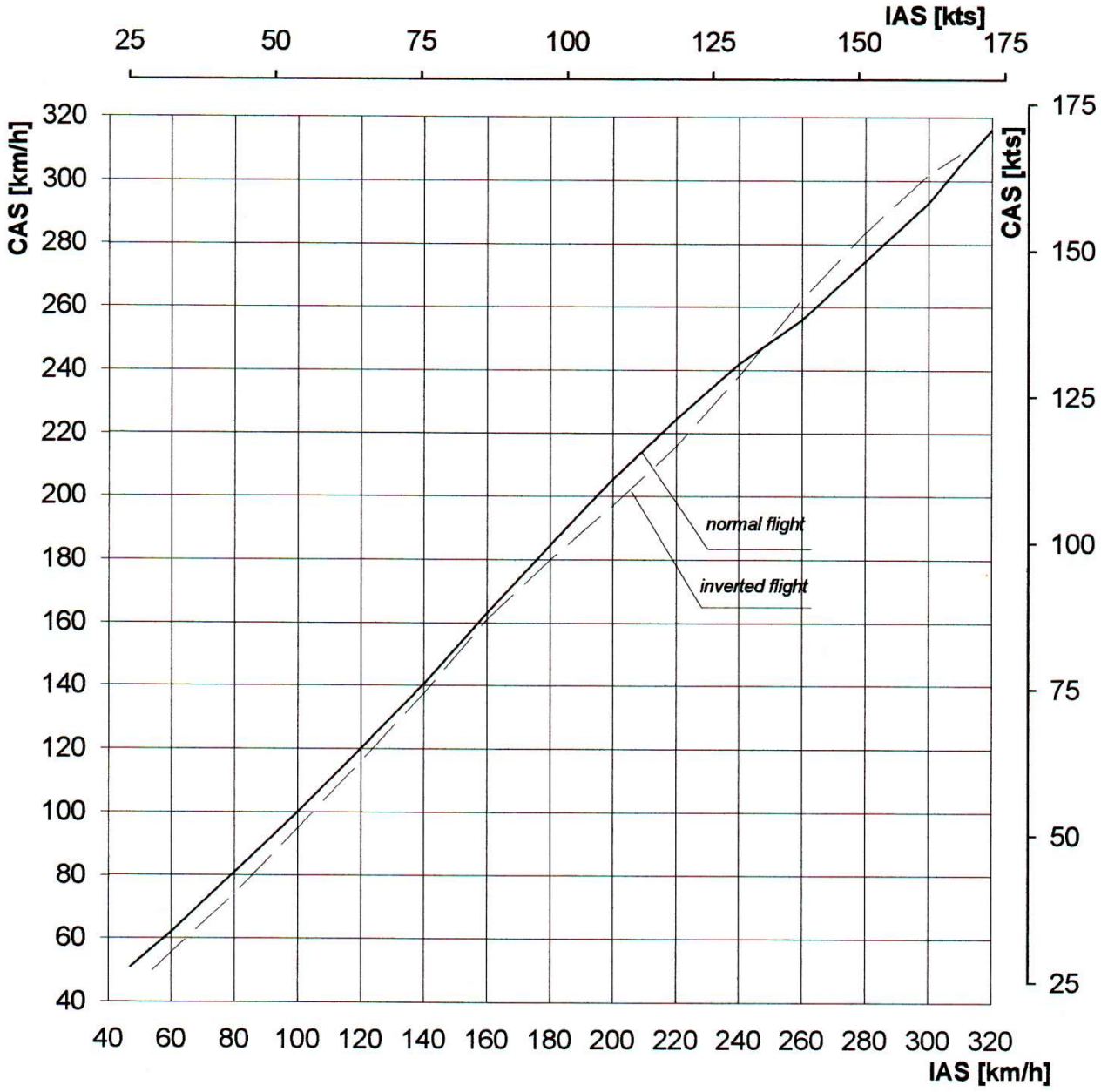
3

The data in the charts has been computed from actual flight tests with the glider in good condition and using average piloting technique.

5.2. Approved data.

3

5.2.1. Airspeed indicator system calibration.



Calibration of airspeed indicator system
MDM-1 „Fox” glider, Fact. Nº P-13

Approved

5.2.2. Stall speeds

3

Stall speed (IAS) for in flight weight								
Version	Aerobatic				Utility			
Crew	1 person		2 person		1 person		2 person	
	kG	lb	kG	lb	kG	lb	kG	lb
In-flight weight	455	1003	530	1168	470	1036	530	1168
	km/h	kt	km/h	kt	km/h	kt	km/h	kt
Stall speed in clean configuration	78,0	42,0	84,0	45,5	76,0	41,0	79,0	42,5
Stall speed with air brake extended	87,0	47,0	94,0	51,0	85,0	46,0	90,0	48,5

4 Approach to stall is indicated by perceptible and audible oscillations (buffeting).

The stalled glider drops down symetrically.

Recovery is troubleless and reliable, by releasing the control stick.

Altitude loss in recovery from wings-level stall, clean configuration does not exceed 50 m {165 ft}.

NOTE: ***Statically stalled glider, with control stick pulled completely aft, passes into a deep stall condition associated with a high sink rate (9÷10 m/s {1800-2000 ft/min}) at indicated speed (IAS) of approx. 85÷100 km/h {46÷54 kt}, whereas the lateral and directional control is retained.***

Such a deep stall can be obtained throughout the whole range of C.G. position, requiring intensive use of ailerons to maintain this flight condition.

Releasing, or pushing the stick slightly results in an immediate recovery to normal flight .

The above remains valid also for stalling the glider in inverted flight,with control stick pushed fully forwards. Also in this case, relaxing the pressure on control stick regains the controlled flight immediately.

4 5.2.3. Take-off performance. — **NOT APPLICABLE**

5.2.4. Additional information. — **NO ADDITIONAL INFORMATION**

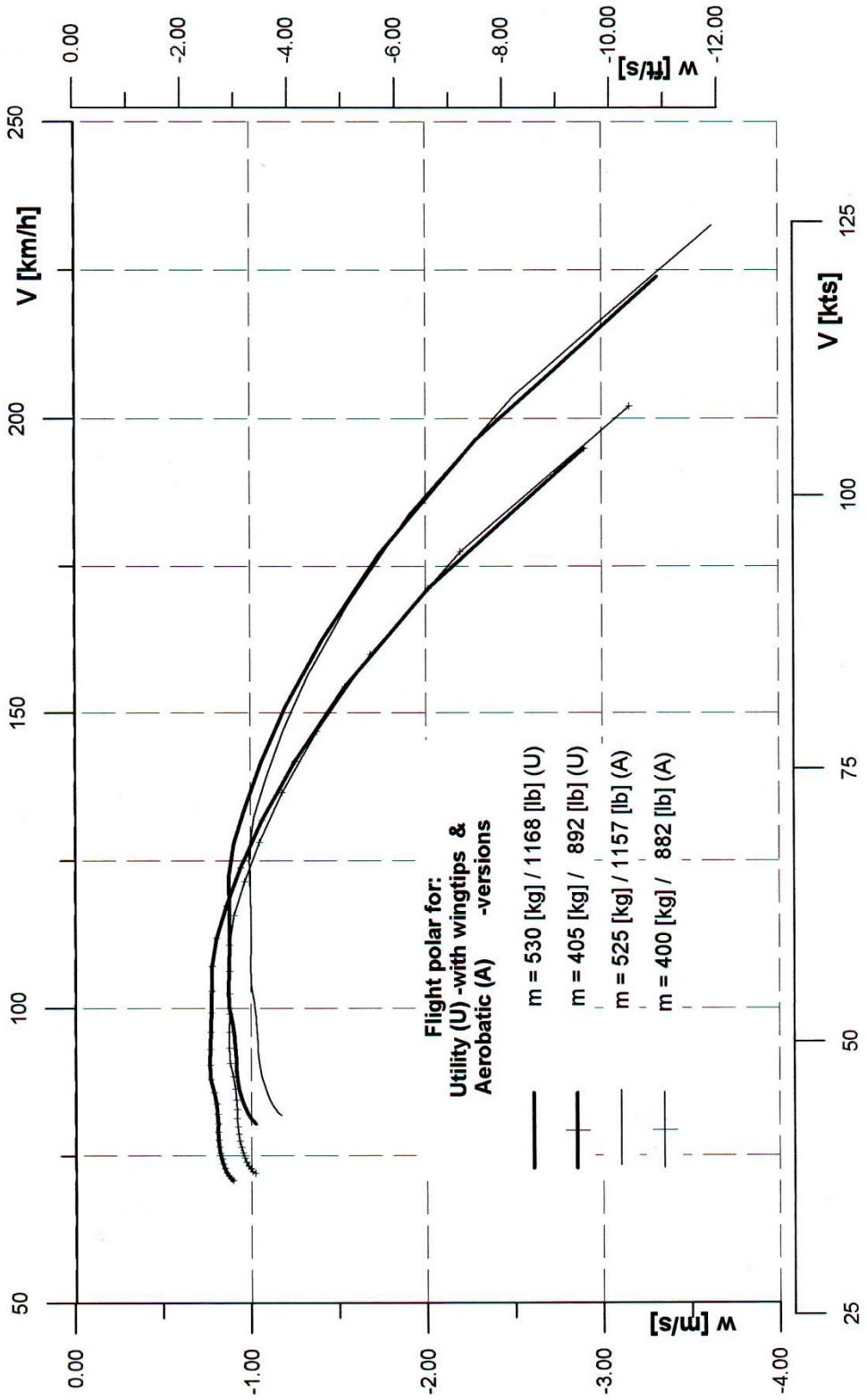
Approved

4 **5.3. Other, non-approved information.**

5.3.1. Demonstrated cross-wind performance.

4 Aerotowed take-offs as well as landings have been demonstrated with cross-wind component up to 17 km/h {9 kt}.

5.3.2. Flight polar.



3 # 6. WEIGHT AND BALANCE

6.1. Introduction.

3 ## 6.2. Records of weight and balance, and permitted payload range.

6.1. Introduction.

This Section contains payload range within which the glider may be safely operated.

3 Procedures for weighing the glider, method for C.G. location calculation and a comprehensive list of all equipment available for this glider, as well as the equipment installed during weighing of the glider are contained in Technical Service Manual.

3 **6.2. Records of weight and balance, and permitted payload range.**

Date	Empty weight	C.G. position of empty glider	Permitted crew weight [kG] S/N:										Approved	
			2-person crew				1-person crew						Date	Signed
			with balancing weights 2 x 5,5 kG		without balancing weights 2 x 5,5 kG		with balancing weights 2 x 5,5 kG		without balancing weights 2 x 5,5 kG					
			Total payload on front and rear seats		Total payload on front and rear seats									
	kG	cm	Max	Min	Max	Min	Max	Min	Max	Min				
1	2	3	4	5	6	7	8	9	10	11	12	13		

In accordance with JAR-22 Appendix H, columns 2 through 11 should be filled with values calculated on the basis of procedure described in Technical Service Manual, item 2.7

3 **Records of weight and balance, and permitted payload range (Imperial units).**

Date	Empty weight	C.G. position of empty glider	Permitted crew weight [lb] S/N:								Approved	
			2-person crew				1-person crew				Date	Signed
			with balancing weights 2 x 12,1 lb		without balancing weights 2 x 12,1 lb		with balancing weights 2 x 12,1 lb		without balancing weights 2 x 12,1 lb			
			Total payload on front and rear seats		Total payload on front and rear seats							
			Max	Min	Max	Min	Max	Min	Max	Min		
1	lb	in	4	5	6	7	8	9	10	11	12	13
	2	3										

In accordance with JAR-22 Appendix H, columns 2 through 11 should be filled with values calculated on the basis of procedure described in Technical Service Manual, item 2.7

7. GLIDER AND SYSTEMS DESCRIPTION

7.1. Introduction.

7.2. Cockpit controls.

7.3. Instrument panel.

7.4. Landing gear retraction system. — **NOT APPLICABLE**

7.5. Seats and safety harness.

3 **7.6. Instrument pneumatic system.**

7.7. Air brake system.

7.8. Loading and baggage fastening. — **NOT APPLICABLE**

7.9. Water ballast system. — **NOT APPLICABLE**

7.10. Power plant. — **NOT APPLICABLE**

7.11. Fuel system. — **NOT APPLICABLE**

3 **7.12. Electrical system.**

7.13. Miscellaneous equipment

7.1. Introduction.

This Section provides description and operation of the glider and its systems. Refer to Section 9 for details of optional equipment.

7.2. Cockpit controls.

3 General view from glider front and rear seats are shown in Fig. 7.1 and Fig. 7.2.

All controls are operated conventionally.

The wheel brake is coupled with air brake, the control lever (Fig. 7.1 and Fig. 7.2 item 16) located on the cockpit left hand side.

The elevator spring trimming device is operated with a grip on the left hand side at the control stick base, at front seat only (Fig 7.1 item 18).

The canopy panels are opened with the white levers (Fig. 7.1 and Fig. 7.2, item 14) located on the left hand side.

Canopy emergency jettison is activated by simultaneously pulling, with both hands the red lever (Fig. 7.1 and Fig. 7.2, item 15) on canopy right hand side, and the canopy opening lever (Fig. 7.1 and Fig. 7.2, item 14) on canopy left hand side. Jettison of each canopy panel independently from front and rear seat.

Adjustment of rudder pedals at front seat — on ground only — by means of an adjustment handle (Fig 7.1 item 11) located under the instrument panel.

No pedals adjustment provided at rear seat.

The front seat pilot’s back rest adjustable on its support (Fig. 7.2, item 23), accessible from rear seat.

Adjust the height of the rear seat with hard cushions.

The tow release control tension member terminated with a yellow hand-grip (Fig. 7.1 and Fig. 7.2, item 9), is located as follows:
- at front seat — on the left hand side,
- at rear seat — on the left hand side of front seat back rest tube.

The air venting control tension member (Fig. 7.1, item 8) is located on the right hand side of instrument panel, at front seat.

Two balancing weights (Fig. 7.1, item 13) of 5,5 kg {12,1 lb} each, are installed with clamps in the floor at front seat.

All levers are provided with appropriate information placards.

Fig. 7.1

Front seat view

3

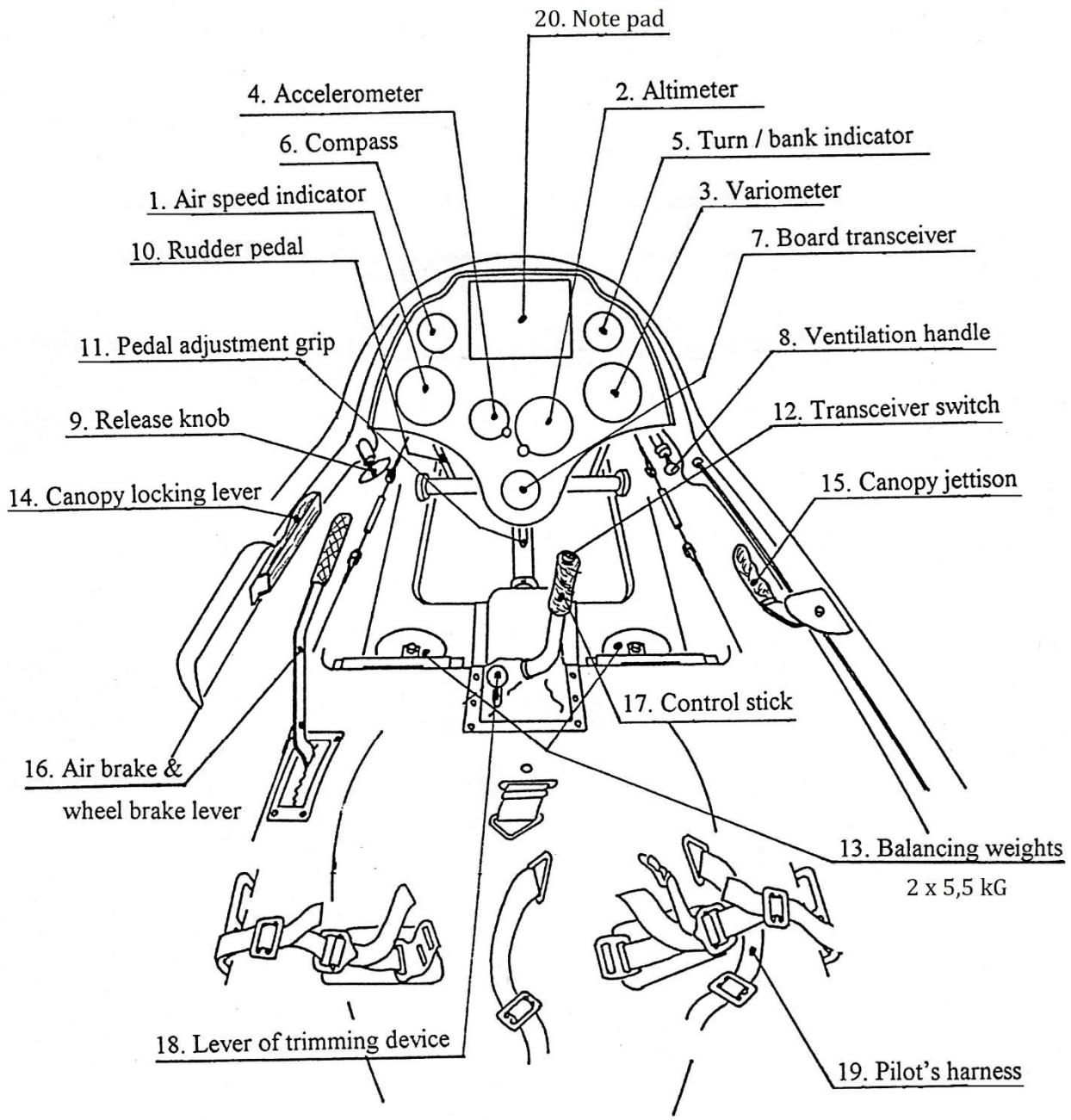
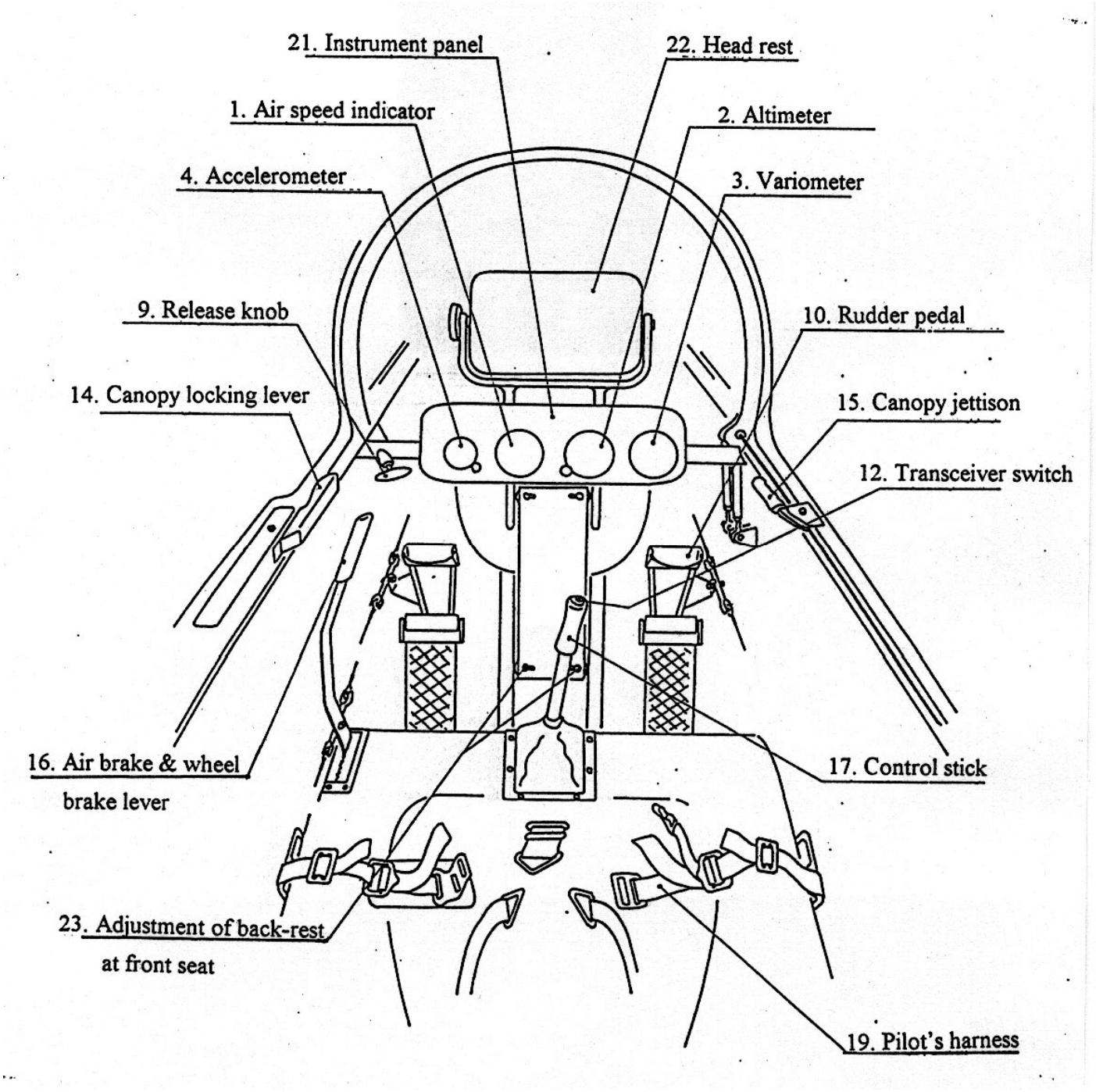


Fig. 7.2

Rear seat view



7.3. Instrument panel.

Instrument panel at front seat is shown in Fig. 7.1.

Instrument panel at rear seat is shown in Fig. 7.2.

7.4. Landing gear retraction system. — NOT APPLICABLE

7.5. Seats and safety harness.

3 The back rest of front seat is adjustable on ground by means of bolts relocation (Fig. 7.2, item 23).

Rear seat is not adjustable.

3 Both seats are equipped with five point safety belts (Fig. 7.1 and Fig. 7.2, item 19) and duplicated anchor fittings for optional lap belts.

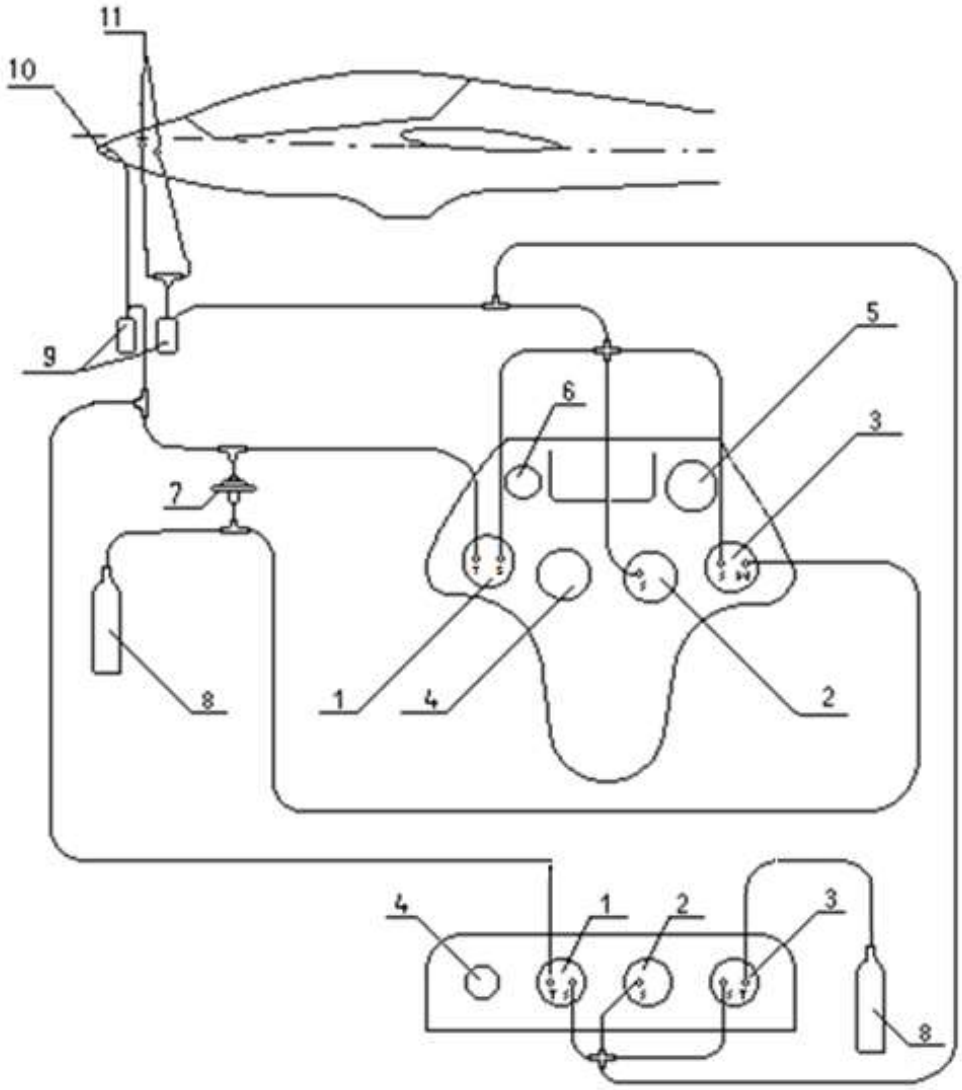
7.6. Instrument pneumatic system.

The connection scheme is shown in Fig. 7.3.

NOTE: After flying in rain or if water is suspected to have entered pressure ducts, they have to be disconnected from instruments and blown with air.

Fig. 7.3

3 Scheme of board instrument pneumatic system



1 - airspeed indicator
2 - altimeter
3 - variometer
4 - accelerometer
5 - turn or bank indicator
6 - compass
7 - total energy compensator
8 - compensation bottle
9 - drainage units
10 - total pressure port
11 - static pressure ports

3 **7.7. Air brake system.**

The glider is equipped with Schempp-Hirth air brake, extended on the upper wing surface.

Control system is of combined type:
cable type — from the air brake control lever in a cockpit to torque tube in fuselage, and pushrod type — in wings.

The air brake locking:
- in retracted position — by the skip beyond „dead point”,
- in extended position — ensured by the stops installed on air brake plate.

7.8. Loading and baggage fastening — **NOT APPLICABLE**

7.9. Water ballast system. — **NOT APPLICABLE**

7.10. Power plant. — **NOT APPLICABLE**

7.11. Fuel system. — **NOT APPLICABLE**

3 **7.12. Electrical system.**

The glider is equipped with battery located behind the back rest of rear seat.
Battery is used for transceiver supply.

3 **7.13. Miscellaneous equipment.**

Descriptions of optional equipment (transceiver, board computer etc.) are contained in documents related to these instruments and also in Section 9 of this Manual.

3 # 8. GLIDER HANDLING, CARE AND MAINTENANCE

8.1. Introduction.

8.2. Glider inspection periods.

3 ## 8.3. Glider alterations and repairs.

8.4. Ground handling and road transportation.

8.5. Cleaning and care.

8.1. Introduction.

3 This Section contains manufacturer's recommended procedures for proper ground handling and servicing of the glider. It also identifies certain inspections and maintenance requirements, which must be followed if the glider is to retain the new-plane performance and dependability.

8.2. Glider inspection periods.

3 Glider inspection periods are specified in the Technical Service Manual.

8.3. Glider alterations and repairs.

Prior to introducing any alterations to the glider, the responsible Airworthiness Authority shall be contacted to ensure that the airworthiness of the glider is not compromised.

Repair procedures should be agreed with glider producer and Airworthiness Authority.

WARNING: No colour inscriptions or markings are allowed on upper surfaces of the wings, tail unit and fuselage.

3 ## 8.4. Ground handling and road transportation.

8.4.1. Airfield transportation

3
- Set the elevator trim to „tail heavy” position.
- Retract the air brake.
- CORRECTLY LOCK THE CANOPY.
- TO PROTECT THE ELEVATOR FROM DAMAGE, FASTEN THE PULLED BACK CONTROL STICK WITH SAFETY BELTS.

Motor vehicle towing:

The glider should not be towed at a speed above 6 km/h {3 kt}.

Towing cable length not less than 6 m {20 ft}.

The glider can be ground towed „nose first” using the nose towing hook or „tail first” on the special tow attachment installed in the fuselage tail.

Hand transportation:

It is recommended to push the glider "tail first" on the wing leading edge, close to the fuselage. Make turns with the tail wheel lifted, using the special handle on the fuselage aft part.

3 *8.4.2. Transportation in a trailer*

To a special order, the producer delivers the COBRA—FOX closed trailer, together with an instruction for loading the glider into trailer..

If the glider is transported in any other type of trailer, it is at the user's own risk.

In such a case, the followings are recommended:
- fix the wings on spar roots near the root rib, and on leading edge at $^2/_3$ semi span,
- wing tips may be fixed in separate holders in the trailer on in a car,
- the fuselage may be fixed on undercarriage wheels and wing/ fuselage connection pivots, provided the mating surfaces of these are protected against damage / scratch,
- the tailplane should be fixed in clamps,
- during transportation, the mating surfaces of fittings, inspection holes and bearings should be protected against dust and dirt,
- immobilise the control stick and the control surfaces,
- close the canopy and protect with flannel cover,
- in case of transportation on an open trailer, the external surfaces of the main glider components should be protected with individual covers and, in case of rain, with plastic foil.

8.5. Cleaning and care.

3 The wing leading edge, and external lacquered coats should be cleaned with a soft flannel cloth, or shammy.

The canopy should be protected against dust with a cover of soft fabric.

For canopy cleaning, a special polishing agent for perspex should be used.

2

9. SUPPLEMENTS

9.1. Introduction.

9.2. List of inserted supplements.

9.3. Supplements inserted.

9.1. Introduction.

2

This section contains the appropriate supplements necessary to safely and efficiently operate the glider when equipped with various additional devices.

9.2. List of inserted supplements.

3

Date of insertion	Doc.No	Title of inserted supplements

2 **9.3. Supplements inserted.**

4

CONTENT INDEX