European Aviation Safety Agency

EASA

TYPE-CERTIFICATE DATA SHEET

SZD-48 "Jantar Standard 2" & "Brawo"

Type Certificate Holder:

Zakład Szybowcowy „Jeżów"
Henryk Mynarski
ul. Długa 93
58-521 Jeżów Sudecki
POLAND

EASA TCDS No. A.446

For variants:
SZD-48 "Jantar Standard 2",
SZD-48-1 "Jantar Standard 2",
SZD-48-3M "Brawo"
SZD-48-3M1 "Brawo"
SZD-48M "Jantar Standard 2M"
SZD-48-1M "Jantar Standard 2M"

Issue 01, 22 March 2007

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0.III. Change Record

Issue	Date	Changes
Issue 01	22 March 2007	Transfer from Polish Type Certificate No. BG-119/1 and Certificate of Approval No BG-14/85 to the EASA Type Design

Section A: SZD-48 "Jantar Standard 2", SZD-48M "Jantar Standard 2M"

A.I. General

1.	Data Sheet No.:	EASA.A.446
2.	a) Type: b) Variant:	SZD-48 SZD-48 "Jantar Standard 2", SZD-48M "Jantar Standard 2M"
3.	Airworthiness Category:	Sailplane, Utility
4.	Type Certificate Holder:	Zakład Szybowcowy „Jeżów" Henryk Mynarski ul. Długa 93 58-521 Jeżów Sudecki POLAND
5.	Manufacturer:	Przedsiębiorstwo Doświadczalno-Produkcyjne Szybownictwa „PZL - Bielsko" ul. Cieszyńska 325 43-300 Bielsko-Biała POLAND
6.	Polish CAA Certification Date	May 26, 1978 (TC No. BG-119)

7. The EASA Type Certificate replaces Polish Type Certificate No. BG-119/1, which replaced the BG-119 on March 25, 2002, due to TC transfer from PDPSz "PZL-Bielsko".

A.II. Certification Basis

1.	Certification Basis:	Defined 26 May 1978
2.	Airworthiness Requirements:	OSTIV Airworthiness Requirements for Sailplanes, September 1976.
3.	Requirements elected to comply:	None
4.	Special Conditions:	None
5.	Exemptions:	

2.43. The glider without water ballast and with rear C.G. position is able to trim only up to speed 110 km/h instead of required 136 km/h.

2.62. Because of unreliable airspeed indications near minimum speed, there is no possibility to evaluate a margin between stalling speed and stall warning speed

2.72. Airbrakes closing force at $0{,}75 \times V_{NE}$ = 188 km/h is 22 daN. It is less then 20 daN at V < 180 km/h.

2.81. During spinning with rear CG positions flat spin turns into steep one.
Recovering from flat spin needs almost 1¼ turn and slightly over 100 m altitude loss.

7.32. V_{NE} = 250 km/h is less than required.

6.	Equivalent Safety Findings:	None

A.III. Technical Characteristics and Operational Limitations

1. Type Design Definition: Drawing No. SZD-480-00-10-00
+ ZSJ-48.100/A1÷A4 (for SZD-48M)

2. Description: Single seat, standard class glider. Cantilever high-wing monoplane with T-shaped tail unit (fixed stabilizer with elevator, fin and rudder). All composite glass-epoxy structure. Bipartite tapered wing may be equipped with winglets removable for transport. Retractable main landing gear with disk brake and without shock absorbers; fixed tail wheel. Plate airbrakes protruding from upper and lower surface of wings. Integral water ballast tanks in wings.
SZD-48M is a modification which consists in installation of one piece canopy from SZD-48-3. It has been confirmed with Certificate of Approval No Z-BG-09/04, dated July 14th, 2004.

3. Equipment: Standard equipment:
- airspeed indicator,
- altimeter,
- compass,
- bank-and-turn indicator,
- rate-of-climb indicator,
- towing hook (or hooks),
- pilot safety belts.

4. Dimensions:

Span	15,00 m
Wing area	10,66 m²
Aspect Ratio	21,1
Length	6,71 m
Height	1,51 m

5. Launching Hook:

Nose towing hook	TOST E 72
	or SZD-III A-56;
Bottom towing hook (optional)	TOST EUROPA G 72
	or SZD-III A-56;

6. Weak links: Ultimate Strength: 6770 N (± 10%)

7. Air Speeds:

Manoeuvring Speed	V_A	170 km/h
Never Exceed Speed	V_{NE}	255 km/h
Maximum permitted speeds		
- in rough air	V_{RA}	200 km/h
- in aero-tow	V_T	150 km/h
- in winch-launch	V_W	125 km/h
- landing gear operating	V_{LO}	255 km/h

8. Operational Capability: VFR Day,
Cloud flying

9. Masses:

Max. Mass with water ballast	535 kg
Max. Mass without water ballast	385 kg
Max. Empty Mass	265 kg

10. Centre of Gravity Range:

Empty glider with standard equipment:

Forward Limit:	510 mm aft of datum point (ADP)
Rearward Limit:	550 mm aft of datum point (ADP)

Centre of Gravity operational limits:

Forward Limit:	158 mm (ADP) (21,3% MAC)
Rearward Limit:	
- without water ballast	336 mm (ADP) (45,3% MAC)
- with water ballast (150 kg)	282 mm (ADP) (38,0% MAC)

MAC is 742 mm; 0% MAC is on the same coordinates along longitudinal axis as the datum.

Datum:	Leading edge and wing-fuselage division plane intersection.
Levelling means:	A trailing point of root chord - 22 mm under its leading point. Root chord is 950 mm.

11. Seating Capacity: 1

12. Lifetime limitations: Refer to Maintenance Manual

13. Other limitations: Aerobatic is permissible only without water ballast.

Manoeuvring load factor limits: +5,3/-2,65

14. Deflection of control surfaces:

Aileron:	- up	27°	± 2°
	- down	16°	± 2°
Elevator:	- up	32°	± 1°
	- down	18°	± 1°
Rudder:	- left	29°	± 1°
	- right	29°	± 1°

A.IV. Operating and Service Instructions

1. Flight Manual:

Polish:	Instrukcja Użytkowania w Locie, Szybowiec SZD-48 „Jantar Standard 2”, wydanie I - maj 1978 r.
English:	SZD-48 “Jantar Standard 2” sailplane, Flight Manual issue I - May 1978
Polish:	Instrukcja Użytkowania w Locie Szybowca SZD-48M „Jantar Standard 2M”, wydanie I - czerwiec 2004 r.

2. Maintenance Manual:

Polish:	Szybowiec SZD-48 „Jantar Standard 2”, Opis Techniczny, Instrukcja Obsługi Technicznej z terminarzem prac okresowych, wydanie I - maj 1978 r.
English:	SZD-48 “Jantar Standard 2” sailplane, Technical Description, Technical Service Manual with the Schedule of Maintenance Works issue I - May 1978
Polish:	Szybowiec SZD-48M „Jantar Standard 2M”, Opis Techniczny, Instrukcja Obsługi Technicznej z terminarzem prac okresowych, wydanie I - czerwiec 2004 r.

3. Repairs Manual:

Polish:	Instrukcja napraw szybowca laminatowego SZD-48 „Jantar Std 2” wydanie I, 1978 r.

A.V. Notes

1. Serial Numbers:
   W-846 ÷ W-890
2. All glider outside surfaces exposed to sunlight must be white painted apart from registration number and anti-collision marks.

Section B: SZD-48-1 "Jantar Standard 2", SZD-48-1M "Jantar Standard 2M"

B.I. General

1.	Data Sheet No.:	EASA.A.446
2.	a) Type: b) Variant:	SZD-48 SZD-48-1 "Jantar Standard 2", SZD-48-1M "Jantar Standard 2M"
3.	Airworthiness Category:	Sailplane, Utility
4.	Type Certificate Holder:	Zakład Szybowcowy „Jeżów" Henryk Mynarski ul. Długa 93 58-521 Jeżów Sudecki POLAND
5.	Manufacturer:	Przedsiębiorstwo Doświadczalno-Produkcyjne Szybownictwa „PZL - Bielsko" ul. Cieszyńska 325 43-300 Bielsko-Biała POLAND
6.	Polish CAA Certification Date	November 30, 1978 (TC No. BG-119)

7. The EASA Type Certificate replaces Polish Type Certificate No. BG-119/1, which replaced the BG-119 on March 25, 2002, due to TC transfer from PDPSz "PZL-Bielsko".

B.II. Certification Basis

1.	Certification Basis:	Defined 30 November 1978
2.	Airworthiness Requirements:	OSTIV Airworthiness Requirements for Sailplanes, September 1976.
3.	Requirements elected to comply:	None
4.	Special Conditions:	None
5.	Exemptions:	
	2.72.	Airbrakes closing force at $0{,}75 \times V_{NE}$ = 188 km/h is 22 daN. It is less then 20 daN at V < 180 km/h.
	2.81.	During spinning with rear CG positions flat spin turns into steep one. Recovering from flat spin needs almost 1¼ turn and slightly over 100 m altitude loss.
6.	Equivalent Safety Findings:	None

B.III. Technical Characteristics and Operational Limitations

1. Type Design Definition: Drawing No. SZD-481-00-10-00
+ ZSJ-48.100/A1÷A4 (for SZD-48-1M)

2. Description: Single seat, standard class glider. Cantilever high-wing monoplane with T-shaped tail unit (fixed stabilizer with elevator, fin and rudder). All composite glass-epoxy structure. Bipartite tapered wing may be equipped with winglets removable for transport. Retractable main landing gear with disk brake and without shock absorbers; fixed tail wheel. Plate airbrakes protruding from upper and lower surface of wings. Integral water ballast tanks in wings.
SZD-48-1M is a modification which consists in installation of one piece canopy from SZD-48-3. It has been confirmed with Certificate of Approval No Z-BG-09/04, dated July 14th, 2004.

3. Equipment: Standard equipment:
- airspeed indicator,
- altimeter,
- compass,
- bank-and-turn indicator,
- rate-of-climb indicator,
- towing hook (or hooks),
- pilot safety belts.

4. Dimensions:

Span	15,00 m
Wing area	10,66 m²
Aspect Ratio	21,1
Length	6,71 m
Height	1,51 m

5. Launching Hook:

Nose towing hook		TOST E 72
	or	SZD-III A-56;
Bottom towing hook (optional)		TOST EUROPA G 72
	or	SZD-III A-56;

6. Weak links: Ultimate Strength: 6770 N (± 10%)

7. Air Speeds:

Manoeuvring Speed	V_A	170 km/h
Never Exceed Speed	V_{NE}	285 km/h
Maximum permitted speeds		
- in rough air	V_{RA}	200 km/h
- in aero-tow	V_T	150 km/h
- in winch-launch	V_W	125 km/h
- landing gear operating	V_{LO}	255 km/h

8. Operational Capability: VFR Day,
Cloud flying

9. Masses:

Max. Mass with water ballast	535 kg
Max. Mass without water ballast	385 kg
Max. Empty Mass	265 kg

10. Centre of Gravity Range:

Empty glider with standard equipment:

Forward Limit:	510 mm aft of datum point (ADP)
Rearward Limit:	550 mm aft of datum point (ADP)

Centre of Gravity operational limits:

Forward Limit:	148 mm (ADP) (20,0% MAC)
Rearward Limit:	
- without water ballast	336 mm (ADP) (45,3% MAC)
- with water ballast (150 kg)	282 mm (ADP) (38,0% MAC)

MAC is 742 mm; 0% MAC is on the same coordinates along longitudinal axis as the datum.

Datum:	Leading edge and wing-fuselage division plane intersection.
Levelling means:	A trailing point of root chord - 22 mm under its leading point. Root chord is 950 mm.

11. Seating Capacity: 1

12. Lifetime limitations: Refer to Maintenance Manual

13. Other limitations: Aerobatic is permissible only without water ballast.

Manoeuvring load factor limits: +5,3/-2,65

14. Deflection of control surfaces:

Aileron:	- up	27°	± 2°
	- down	16°	± 2°
Elevator:	- up	32°	± 1°
	- down	18°	± 1°
Rudder:	- left	29°	± 1°
	- right	29°	± 1°

B.IV. Operating and Service Instructions

1. Flight Manual:

Polish:	Instrukcja Użytkowania w Locie, Szybowiec SZD-48-1 „Jantar Standard 2”, wydanie I - listopad 1978 r.
English:	SZD-48-1 “Jantar Standard 2” sailplane, Flight Manual issue I - November 1978
Polish:	Instrukcja Użytkowania w Locie Szybowca SZD-48-1M „Jantar Standard 2M”, wydanie I - czerwiec 2004 r.

2. Maintenance Manual:

Polish:	Szybowiec SZD-48-1 „Jantar Standard 2”, Opis Techniczny, Instrukcja Obsługi Technicznej z terminarzem prac okresowych, wydanie I - listopad 1978 r.
English:	SZD-48-1 “Jantar Standard 2” sailplane, Technical Description, Technical Service Manual with the Schedule of Maintenance Works issue I - November 1978
Polish:	Szybowiec SZD-48-1M „Jantar Standard 2M”, Opis Techniczny, Instrukcja Obsługi Technicznej z terminarzem prac okresowych, wydanie I - czerwiec 2004 r.

B.V. Notes

1. Serial Numbers:
   W-891 ÷ W-926,
   B-985 ÷ B-1064,
   B-1095 ÷ B-1124,
   B-1135 ÷ B-1274.
2. All glider outside surfaces exposed to sunlight must be white painted apart from registration number and anti-collision marks.

Section C: SZD-48-3M "Brawo"

C.I. General

1.	Data Sheet No.:	EASA.A.446
2.	a) Type: b) Variant:	SZD-48 SZD-48-3M "Brawo"
3.	Airworthiness Category:	Sailplane, Utility
4.	Type Certificate Holder:	Zakład Szybowcowy „Jeżów" Henryk Mynarski ul. Długa 93 58-521 Jeżów Sudecki POLAND
5.	Manufacturer:	Przedsiębiorstwo Doświadczalno-Produkcyjne Szybownictwa „PZL - Bielsko" ul. Cieszyńska 325 43-300 Bielsko-Biała POLAND
6.	Polish CAA Certification Date	May 21, 1985

7. The EASA Type Certificate replaces Polish Type Certificate of Approval No. BG-14/85

C.II. Certification Basis

1.	Certification Basis:	Defined 21 May 1985
2.	Airworthiness Requirements:	OSTIV Airworthiness Requirements for Sailplanes, September 1976, Amendment No 1, June 1983.
3.	Requirements elected to comply:	None
4.	Special Conditions:	None
5.	Exemptions:	None
6.	Equivalent Safety Findings:	None

C.III. Technical Characteristics and Operational Limitations

1.	Type Design Definition:	Drawing No. SZD-483M-00-10-00		
2.	Description:	Single seat, standard class glider. Cantilever high-wing monoplane with T-shaped tail unit (fixed stabilizer with elevator, fin and rudder). All composite glass-epoxy structure. Bipartite tapered wing equipped with plate airbrakes protruding only from upper surface. Retractable main landing gear with disk brake and without shock absorbers; fixed tail wheel. Integral water ballast tanks in wings and fin. SZD-48-3M is a modification of SZD-48-3 (TCDS EASA.A.041). Main changes include: trailing edge elongation, fin ballast tank installation, airbrakes protruding only from upper surface.		
3.	Equipment:	Standard equipment: - airspeed indicator, - altimeter, - compass, - bank-and-turn indicator, - rate-of-climb indicator, - towing hook, - pilot safety belts.		
4.	Dimensions:	Span Wing area Aspect Ratio Length Height	15,00 m 10,90 m² 20,64 6,71 m 1,51 m	
5.	Launching Hook:		SZD-III-56 c	
6.	Weak links:	Ultimate Strength:	6770 N (± 10%)	
7.	Air Speeds:	Manoeuvring Speed Never Exceed Speed Maximum permitted speeds - in rough air - in aero-tow	V_A V_{NE} V_{RA} V_T	180 km/h 285 km/h 180 km/h 150 km/h
8.	Operational Capability	VFR Day, Cloud flying		
9.	Masses:	Max. Mass with water ballast Max. Mass without water ballast Max. Empty Mass		490 kg 360 kg 240 kg
10.	Centre of Gravity Range:	Empty glider with standard equipment: Forward Limit: Rearward Limit: Centre of Gravity operational limits: Forward Limit: Rearward Limit: MAC is 760 mm; 0% MAC is on the same coordinates along longitudinal axis as the datum. Datum: Levelling means:		520 mm aft of datum point (ADP) 540 mm aft of datum point (ADP) 145 mm (ADP) (19,0% MAC) 319 mm (ADP) (42,0% MAC) Leading edge and wing-fuselage division plane intersection. A trailing point of root chord - 22 mm under its leading point. Root chord is 970 mm.
11.	Seating Capacity:	1		
12.	Lifetime limitations:	Refer to Maintenance Manual		

13. Other limitations:

Winch launching is forbidden
Aerobatic with water ballast is forbidden
Cloud flying with water ballast is forbidden

Manoeuvring load factor limits: +5,3/-2,65

14. Deflection of control surfaces:

Aileron:	- up	27°	± 2°
	- down	16°	± 2°
Elevator:	- up	32°	± 1°
	- down	20°	− 1°
Rudder:	- left	29°	± 1°
	- right	29°	± 1°

C.IV. Operating and Service Instructions

1. Flight Manual:

Polish: Szybowiec SZD-48-3M „Brawo"
Instrukcja Użytkowania w Locie,
wydanie I - maj 1985 r.

2. Maintenance Manual:

Polish: Szybowiec SZD-48-3M „Brawo",
Opis Techniczny, Instrukcja Obsługi Technicznej
z terminarzem prac okresowych,
wydanie I - maj 1985 r.

C.V. Notes

1. Serial Numbers:
   B-1510
2. All glider outside surfaces exposed to sunlight must be white painted apart from registration number and anti-collision marks.

Section D: SZD-48-3M1 "Brawo"

D.I. General

1.	Data Sheet No.:	EASA.A.446
2.	a) Type: b) Variant:	SZD-48 SZD-48-3M1 "Brawo"
3.	Airworthiness Category:	Sailplane, Utility
4.	Type Certificate Holder:	Zakład Szybowcowy „Jeżów" Henryk Mynarski ul. Długa 93 58-521 Jeżów Sudecki POLAND
5.	Manufacturer:	Przedsiębiorstwo Doświadczalno-Produkcyjne Szybownictwa „PZL - Bielsko" ul. Cieszyńska 325 43-300 Bielsko-Biała POLAND
6.	Polish CAA Certification Date	June 06, 1988

7. The EASA Type Certificate replaces Polish Type Certificate of Approval No. BG-14/85

D.II. Certification Basis

1.	Certification Basis:	Defined 21 May 1985
2.	Airworthiness Requirements:	OSTIV Airworthiness Requirements for Sailplanes, September 1976, Amendment No 1, June 1983.
3.	Requirements elected to comply:	None
4.	Special Conditions:	None
5.	Exemptions:	None
6.	Equivalent Safety Findings:	None

D.III. Technical Characteristics and Operational Limitations

1. Type Design Definition: Drawing No. SZD-483M1-00-10-00

2. Description: Single seat, standard class glider. Cantilever high-wing monoplane with T-shaped tail unit (fixed stabilizer with elevator, fin and rudder). All composite glass-epoxy structure. Bipartite tapered wing equipped with plate airbrakes protruding only from upper surface. Retractable main landing gear with disk brake and without shock absorbers; fixed tail wheel. Integral water ballast tanks in wings and fin.
SZD-48-3M1 is a modification of SZD-48-3 (TCDS EASA.A.041). Main changes include: fin ballast tank installation, airbrakes protruding only from upper surface. SZD-48-3M1 differs from SZD-48-3M that there is no trailing edge elongation.

3. Equipment: Standard equipment:
   - airspeed indicator,
   - altimeter,
   - compass,
   - bank-and-turn indicator,
   - rate-of-climb indicator,
   - towing hook,
   - pilot safety belts.

4. Dimensions:

Span	15,00 m
Wing area	10,66 m²
Aspect Ratio	21,1
Length	6,71 m
Height	1,51 m

5. Launching Hook: SZD-III-56 c

6. Weak links: Ultimate Strength: 6770 N (± 10%)

7. Air Speeds:

Manoeuvring Speed	V_A	180 km/h
Never Exceed Speed	V_{NE}	285 km/h
Maximum permitted speeds		
- in rough air	V_{RA}	180 km/h
- in aero-tow	V_T	150 km/h

8. Operational Capability: VFR Day; Cloud flying

9. Masses:

Max. Mass with water ballast	490 kg
Max. Mass without water ballast	365 kg
Max. Empty Mass	240 kg

10. Centre of Gravity Range:
Empty glider with standard equipment:
Forward Limit: 520 mm aft of datum point (ADP)
Rearward Limit: 540 mm aft of datum point (ADP)

Centre of Gravity operational limits:
Forward Limit: 141 mm (ADP) (19,0% MAC)
Rearward Limit: 311 mm (ADP) (42,0% MAC)

MAC is 742 mm; 0% MAC is on the same coordinates along longitudinal axis as the datum.

Datum: Leading edge and wing``-fuselage division plane intersection.

Levelling means: A trailing point of root chord - 22 mm under its leading point. Root chord is 950 mm.

11. Seating Capacity: 1

12. Lifetime limitations: Refer to Maintenance Manual

13. Other limitations:

Winch launching is forbidden
Aerobatic with water ballast is forbidden
Cloud flying with water ballast is forbidden

Manoeuvring load factor limits: +5,3/-2,65

14. Deflection of control surfaces:

Aileron:	- up	27°	± 2°
	- down	16°	± 2°
Elevator:	- up	32°	± 1°
	- down	20°	− 1°
Rudder:	- left	29°	± 1°
	- right	29°	± 1°

D.IV. Operating and Service Instructions

1. Flight Manual:

Polish: Szybowiec SZD-48-3M1 „Brawo"
Instrukcja Użytkowania w Locie,
wydanie I - maj 1988 r.

2. Maintenance Manual:

Polish: Szybowiec SZD-48-3M1 „Brawo",
Opis Techniczny, Instrukcja Obsługi Technicznej
z terminarzem prac okresowych,
wydanie I - maj 1988 r.

D.V. Notes

1. Serial Numbers:
   B-1508
2. All glider outside surfaces exposed to sunlight must be white painted apart from registration number and anti-collision marks.