Type Acceptance Report

TAR 20/21B/21

M&D Flugzeugbau JS-MD Single

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Executive Summary

New Zealand Type Acceptance has been granted to the M & D Flugzeugbau JS-MD Single series based on validation of Type Certificate number EASA.A.616. There are no special requirements for import.

Applicability is currently limited to the Models and/or serial numbers detailed in Section 2, which are now eligible for the issue of an Airworthiness Certificate in the Standard Category in accordance with NZCAR §21.177, subject to any outstanding New Zealand operational requirements being met. (See Section 5 of this report for a review of compliance of the basic type design with the operating Rules.) Additional variants or serial numbers approved under the foreign type certificate can become type accepted after supply of the applicable documentation, in accordance with the provisions of NZCAR §21.43(c).

NOTE: The information in this report was correct as at the date of issue. The report is generally only updated when an application is received to revise the Type Acceptance Certificate. For details on the current type certificate holder and any specific technical data, refer to the latest revision of the State-of-Design Type Certificate Data Sheet referenced herein.

1. Introduction

This report details the basis on which Type Acceptance Certificate No. 20/21B/21 was granted in the Standard Category in accordance with NZCAR Part 21 Subpart B.

Specifically the report aims to:

(a) Specify the foreign type certificate and associated airworthiness design standard used for type acceptance of the model in New Zealand; and

(b) Identify any special conditions for import applicable to any model covered by the Type Acceptance Certificate; and

(c) Identify any additional requirements which must be complied with prior to the issue of a NZ Airworthiness Certificate or for any subsequent operations.

The report notes the status of all models included under the State-of-Design type certificate which have been granted type acceptance in New Zealand, which are listed in Section 2. The history of the JD-MD Single series type acceptance in New Zealand under EASA type certificate EASA.A.616 is listed in Appendix 1.

2. Aircraft Certification Details

(a) State-of-Design Type and Production Certificates:

Manufacturer:	M&D Flugzeugbau GmbH & Co. KG
Type Certificate:	EASA.A.616
Issued by:	European Aviation Safety Authority
Production Approval:	DE.21G.208

(b) Models Covered by the Part 21B Type Acceptance Certificate:

(i) **Model:** JS-MD 1C

MCTOW:	600 kg – JS-MD 1C (18m span) 482 kg – JS-MD 1C (18m span) – without water ballast 720 kg – JS-MD 1C (21m span)
Noise Standard:	ICAO Annex 16
Engine:	MD-TJ42 (Jet Sustainer option) Type Certificate: EASA.E.099 Issued by: European Aviation Safety Agency

(ii) **Model:** JS-MD 3

MCTOW:	525 kg – JS-MD 3 (15m span) 418 kg – JS-MD 3 (15m span) – without water ballast 600 kg – JS-MD 3 (18m span) 418 kg – JS-MD 3 (18m span) – without water ballast
Noise Standard:	ICAO Annex 16
Engine:	MD-TJ42 (Jet Sustainer option) Type Certificate: EASA.E.099 Issued by: European Aviation Safety Agency

3. Application Details and Background Information

The application for New Zealand type acceptance of the JS-MD Single series was from the manufacturer, M&D Fluzeugbau, dated 15 June 2020. The JS-MD Single series are single-seat sailplanes of all-composite construction with T-type empennage, retractable main landing gear, and provision for water ballast. The shoulder-mounted wing is equipped with full-span flaperons, and upper-surface airbrakes. The JS-MD 1C is available in either 18m or 21m span outer wing options, while the JS-MD 3 can be had in 15m or 18m versions, all with winglets. When fitted with the optional MD-TJ42 jet engine the JS-MD Single becomes a self-sustaining powered sailplane.

Type Acceptance Certificate Number 20/21B/21 was granted on 26 August 2020 to the M&D Flugzeugbau Models JS-MD 1C and JS-MD 3 based on validation of EASA Type Certificate EASA.A.616. Specific applicability is limited to the coverage provided by the operating documentation supplied. There are no special requirements for import into New Zealand.

M&D Flugzeugbau has become the State-of-Design for the Jonkers series of sailplanes. The JS-1 Revelation was the first model, intended for Open Class competition and was originally type certificated in South Africa in 2010. Eventually three versions of the JS-1 were developed and approved by the SACAA, with 18m or 21m spans. The last version is now the standard production model and is manufactured under the EASA type certificate as the JS-MD 1C.

The next Jonkers model was the JS-3 Rapture, which was a development intended for the FAI 15m and 18m Classes. The most notable change was the mounting of the wing higher in the fuselage. An initial application for type certification was made to the SACAA in 2014. Subsequently the whole project was transferred to EASA jurisdiction in 2017 and type certificated under the designation JS-MD 3. The sailplane is available in 15m or 18m span configuration. The aircraft are still manufactured by Jonkers Sailplanes in South Africa, in their capacity as an EASA Part 21G sub-contractor to M&D Flugzeugbau. The latter does the final assembly and quality acceptance in Germany.

Both models can be fitted with a Jet Sustainer System. This option uses a turbine engine mounted on a retractable pylon in the rear section of the fuselage, which is controlled by the Jet Display Unit (JDU) on the instrument panel. Data from the JDU is sent to the Electronic Computer Unit (ECU) where the data is processed. Various control inputs include; extension/retraction, start-up/shutdown and desired throttle setting. RPM is regulated by the ECU by adjusting the fuel pump voltage. Pylon extension/retraction kinematics is contained inside the jet box. An electromechanical actuator controls the pylon position, which is connected through a cam and bell-crank system allowing the jet doors to open in sequence with the movement of the pylon.

4. NZCAR §21.43 Data Requirements

The type data requirements of NZCAR Part 21B Para §21.43 have been satisfied by supply of the following documents:

(1) ICAO Type certificate:

EASA Type Certificate A.616 issued 1 June 2017

EASA Type Certificate Data Sheet number A.616 at Issue 4 dated 18 July 2019
– Model JS-MD 1C approved 1 June 2017
– Model JS-MD 3 approved 18 July 2019

(2) Airworthiness design requirements:

(i) Airworthiness Design Standards:
The certification basis of JS-MD Single models is the Certification Specifications for Sailplanes and Powered Sailplanes (CS-22) at Amendment 2 issued 5th March 2009, plus elect to comply with the Standards for structural substantiation of sailplane and powered sailplane components consisting of glass or carbon fibre reinforced plastics, I 4-FVK/91, issued July 1991, LBA, and the Guideline for the analysis of the electrical system for powered sailplanes, I 334 MS 92, issued 15.September 1992.

This is an acceptable certification basis in accordance with CAR Part 21B paragraph §21.41, as CS-22 is the successor to JAR-22 which is an acceptable certification basis for sailplanes and powered sailplanes in accordance with Part 21 Appendix C and Advisory Circular 21-1. There are no non-compliances and no additional special conditions have been prescribed by the Director under §21.23.

(ii) Special Conditions:
Nil.

(iii) Equivalent Level of Safety Findings:
Nil.

(iv) Airworthiness Limitations:
Section 4 of the applicable Maintenance Manual. The airframe has a service life of 12,000 hours, and requires special inspections at set intervals to reach this figure. The MD-TJ42 (at MM Issue 6) has a life limit of 449 starts.

(3) Aircraft Noise and Engine Emission Standards:

(i) Environmental Standard:
ICAO Annex 16 – In accordance with the provisions of Article 6.1 of Regulation 216/2008 compliance is not required for a self-sustaining powered sailplane.

Compliance Listing:
TCDSN EASA.A.616 at Issue 2 dated 18 July 2019.

(4) Certification Compliance Listing:

M&D Flugzeugbau Document No.: MD10-CPS-00-001 – Compliance Summary – JS-MD Single – Model JD-MS 3 (Appendix 1: Compliance Checklist)

M&D Flugzeugbau Document No.: MD10-CTP-00-001 – Certification Program – JS-MD Single – Model JD-MS 3

(5) Flight Manual: EASA-approved Aircraft Flight Manual for the JS-MD 1C – Document No. MD01-AFM-00-001 – CAA accepted as AIR 3965

EASA-approved Jet Sustainer Flight Manual Supplement for the JS-MD 1C – Document No. MD01-AFM-00-002

EASA-approved Aircraft Flight Manual for the JS-MD 3 – Document No. MD10-AFM-00-001 – CAA accepted as AIR 3966

EASA-approved Jet Sustainer Flight Manual Supplement for the JS-MD 3 – Document No. MD10-AFM-00-002

(6) Operating Data for Aircraft:

(i) Maintenance Manual:
List of Applicable Manuals / ICA – Document No. MD01-LAM-00-001

JS-MD 1C Aircraft Maintenance Manual – Document No. MD01-AMM-00-001
JS-MD 1C Jet Sustainer Maintenance Manual Supplement – Document Number MD01-AMM-00-002

JS-MD 3 Aircraft Maintenance Manual – Document No. MD10-AMM-00-001
JS-MD 3 Jet Sustainer Maintenance Manual Supplement – Document Number MD10-AMM-00-002

JS-MD Aircraft Repair Manual – Document No. MD01-ARM-00-001

(ii) Current service Information:
JS-MD Single Service Bulletins and Service Letters

(iii) Illustrated Parts Catalogue:
Not produced

(7) Agreement from manufacturer to supply updates of data in (5), and (6):

CAA Form 2171 signed by Head of Quality Management dated 24/06/2020

SB/SL are available through the website: https://md-flugzeugbau.de/en/

5. New Zealand Operational Rule Compliance

Compliance with the retrospective airworthiness requirements of NZCAR Part 26 is a prerequisite for the grant of a type acceptance certificate.

Civil Aviation Rules Part 26
Subpart B – Additional Airworthiness Requirements

Appendix B – All Aircraft

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
B.1	Marking of Doors and Emergency Exits	***To be determined on an individual aircraft basis***
B.2	Crew Protection Requirements – CAM 8 Appdx. B # .35	Not Applicable – Applies to agricultural aircraft only

Compliance with the following additional NZ operating requirements has been reviewed and were found to be covered by either the original certification requirements or the basic build standard of the aircraft, except as noted:

Civil Aviation Rules Part 91
Subpart F – Instrument and Equipment Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
91.505	Shoulder Harness if Aerobatic; >10 pax; Flight Training	4-point harness required – See TCDS Minimum Equipment
91.507	Pax Information Signs – Smoking, safety belts fastened	Not Applicable – 10 seats or more only
91.509	Minimum Instruments and Equipment	Not Applicable – Powered aircraft only
91.511	Night VFR Instruments and Equipment	Not Applicable – Certificated for Day VFR flight only
91.513	VFR Communication Equipment	***Operational requirement – compliance as applicable***
91.517	IFR Instruments and Equipment	Not Applicable – Certificated for Day VFR flight only
91.519	IFR Communication and Navigation Equipment	Not Applicable – Certificated for Day VFR flight only
91.523	Emergency Equipment	N/A – Single-seat glider [Superseded by §104.101(5)]
91.529	ELT - TSO C91a after 1/4/97 (or replacement)	***Operational requirement – compliance as applicable***
91.531	Oxygen Indicators - Volume/Pressure/Delivery	***Operational requirement – compliance as applicable***
91.533	Oxygen for Non-Pressurised Aircraft (required for >30 min above FL100)	***Operational requirement – compliance as applicable*** (An oxygen bottle can be fitted on the LHS behind the seatback)
91.541	SSR Transponder and Altitude Reporting Equipment	***Operational requirement – compliance as applicable***
91.543	Altitude Alerting Device - Turbojet or Turbofan	Not Applicable
91.545	Assigned Altitude Indicator	Not Applicable – Certificated for Day VFR flight only
A.15	ELT Installation Requirements	***To be determined on an individual aircraft basis***

Civil Aviation Rules Part 104
Subpart C – Equipment and Maintenance Requirements

PARA:	REQUIREMENT:	MEANS OF COMPLIANCE:
104.101	(1) Airspeed Indicator	Required as Minimum Equipment – See TCDS Minimum Equipment
	(2) Altimeter (Adjustable for barometric pressure)	Required as Minimum Equipment – See TCDS Minimum Equipment
	(3) Magnetic Compass	***To be determined on an individual aircraft basis***
	(4) Safety Harness for each seat	Required as Minimum Equipment – See TCDS Minimum Equipment
	(5) A First Aid Kit	***To be determined on an individual aircraft basis***
	(6) For powered gliders (jet sustainer option) –	
	(i) Fuel gauge for each main fuel tank	Displayed by the electronic Jet Display Unit (JDU)
	(ii) Oil Pressure Gauge or warning device	Not Applicable – Total loss fuel pre-mix system
	(iii) A tachometer or engine governor light	Displayed by JDU (required equipment with MD-TJ42 engine)
	(7) For IMC - (i) A variometer (ii) Turn & Slip/Artificial Horizon (iii) Radio transceiver	***Approved for cloud flying (without ballast) if equipped per TCDS***

NOTES: 1. A Design Rule reference in the Means of Compliance column indicates the Design Rule was directly equivalent to the CAR requirement, and compliance is achieved for the basic aircraft type design by certification against the original Design Rule.

2. The CAR Compliance Tables above were correct at the time of issue of the Type Acceptance Report. The Rules may have changed since that date and should be checked individually.

3. Some means of compliance above are specific to a particular model/configuration. Compliance with Part 91/119 operating requirements should be checked in each case, particularly oxygen system capacity and emergency equipment.

Attachments

The following documents form attachments to this report:

Three-view drawings M&D Flugzeugbau JS-MD 1C and JS-MD 3
Copy of EASA Type Certificate Data Sheet A.616

Sign off

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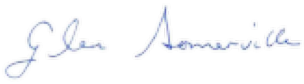
David Gill
Team Leader Aircraft Inspection



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Checked – Glen Somerville
Airworthiness Engineer

Appendix 1

List of Type Accepted Variants:

Model:	*Applicant:*	*CAA Work Request:*	*Date Granted:*
JS-MD 1C, JS-MD 3	M&D Flugzeugbau	20/21B/21	26 August 2020

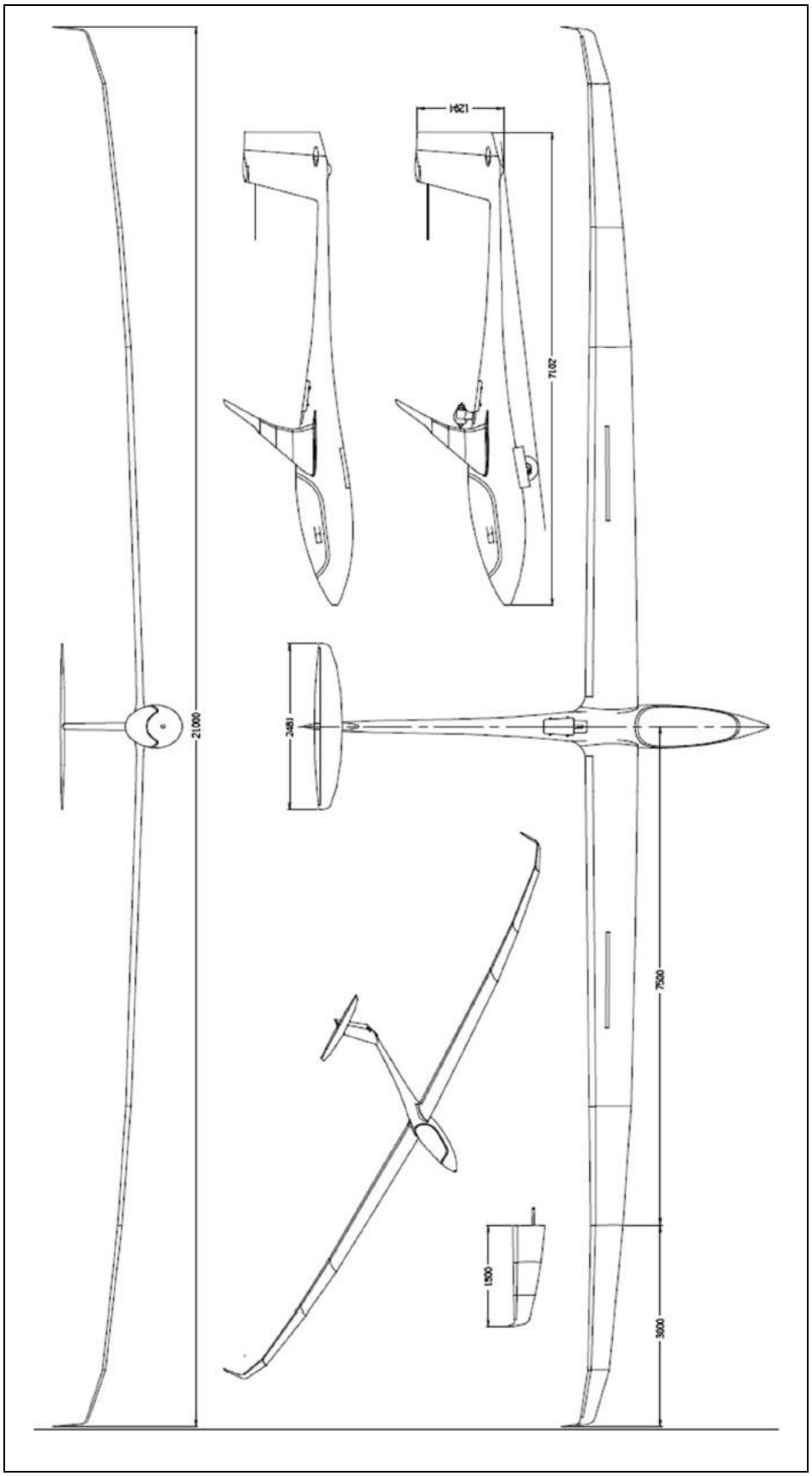

Fig.1 Three-view drawing Model JS-MD 1C 18m

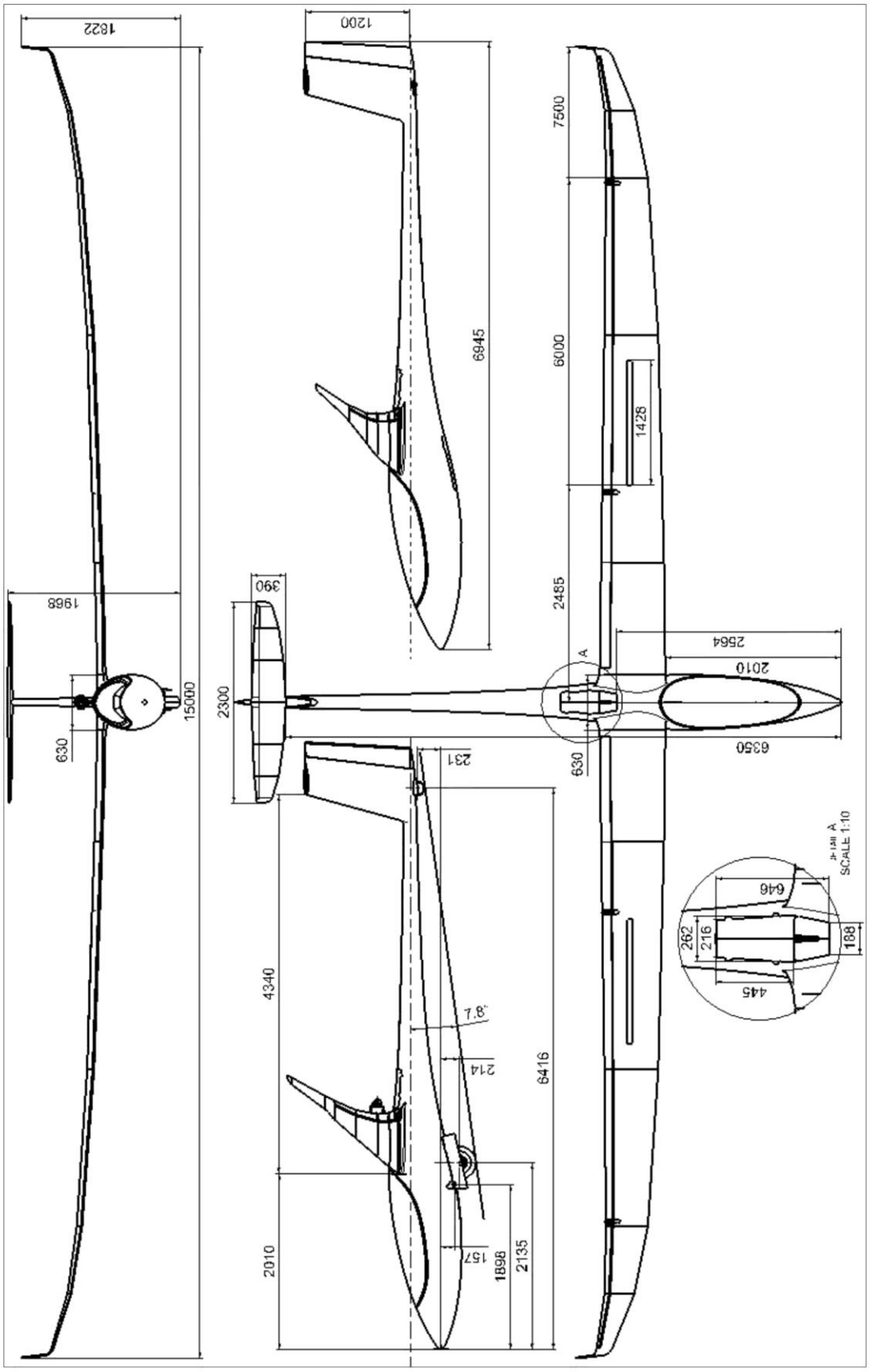

Fig.2 Three-View Drawing JS-MD 3 15m