



**Moscow Aviation Institute**  
(State University of Aerospace Technologies)

# Multi-Purpose Airplane **MAI-223**



**Commercial Offer**

# Introduction



**MAI-223** airplane has been designed at Design Bureau of Moscow Aviation Institute (**OSKBES MAI**) that has more than 40-year-long experience of designing light airplanes.

**MAI-223** is a continuation of our concept of professionally designed and produced ultra light airplane with aerobatic abilities. The main difference is concluded in appreciably better performance and possibility of delivery as a kit.

During design process were made:

- aerodynamic calculations,
- calculations of stability and controllability,
- calculations of strength and resistance to fatigue,
- flutter calculations,
- full cycle of ground and flight tests.

Though **MAI-223** is an Ultralight, it can be certified as a very light airplane, due to the fact that it was designed in accordance with JAR VLA regulations.

# Description



## Design features

**MAI-223** is a single-engine two-seat semicantilever monoplane-parasol with non-retractable landing gear. Perfect controllability in all channels and an excellent pilot view from the cockpit make the plane extremely safe and pleasant for piloting. High thrust-to-weight ratio, high-lift device and landing gear with tail wheel allow to use airplane from short, unprepared runways. Due to the folding wing airplane is very convenient for storage and transportation.

## Structure and system description

**Fuselage** has a mixed construction: fiberglass cockpit with aluminium frame and monocoque fiberglass rear part of fuselage.

**Folded wing** has two spars and stamped metal sheet ribs made of aviation aluminum alloy with diagonal bracing and fabric covering.

**Ailerons, flaps and tail unit** made of aluminum alloy have fabric covering.

**Landing gear** is of non-retractable type with tailwheel. Hydraulic disc brakes have a unit of differential braking. Floats and ski landing gear are enabled.

**Flying controls** is conventional; manually actuated elevator, rudder and ailerons. Electrically actuated flaps and trim tab.

**Cockpit.** Accommodation is side-by-side. Fully enclosed cockpit with heater and ventilation has storage space behind seat.

**Power plant** can include:

- single engine *ROTAX 912ULS* – a four stroke, petrol, four-cylinder engine with combined cooling and mixture formation in the carburettor and a three-blade propeller of ground adjustable pitch type with composite blades. Fuel – gasoline with octane number not less than 92.



- single engine *ROTAX 582UL* or *ROTAX 503UL* - a 2 stroke, petrol, two-cylinder engine with mixture formation in the carburettor and a three-blade propeller of ground adjustable pitch type with composite blades. Fuel – blend of gasoline (octane number not less than 92) and two-stroke oil.

### Group of engine control instruments

- *ROTAX 912ULS* – a tachometer, an indicator of temperature of cylinders heads, oil temperature indicator and oil pressure indicator.
- *ROTAX 582UL* or *ROTAX 503UL* – tachometer and temperature indicator.

### Flight and navigation equipment

- altimeter VD-10K;
- speed indicator US-250;
- rate of climb indicator VR-10 M
- slip indicator EUP-61;
- magnetic compass KI-13;
- Pitot-static tube PVD-6M.

### Electrical equipment

Airplane is equipped with the battery *GP 12260* (CSB Battery Co, LTD) with capacity of 26 A/h. Electric equipment with total power consumption up to 250 W at voltage 12 V can be additionally used on the board.

# Warranty

Guaranteed service life in years, accrued operation time in hours and landings are subject for mutual agreement and should be indicated in a contract for supplying airplanes. They should be no less than 12 months or 200 flight hours.

For the engine *ROTAX 912ULS* or *ROTAX-912S* operation time until the first overhaul is 1500 flight hours.

For the engine *ROTAX 582* or *ROTAX 503*, operation time until the first overhaul is 300 flight hours.

For providing maintenance works with the period of guaranteed service life, the Buyer may be provided with the maintenance crew on the term which should be agreed upon in the contract for supplying airplanes.

# General performance

Maximum take-off weight, kg	495	540	610
Wing span, m	8,19	8,19	8,19
Wing area, m <sup>2</sup>	11,4	11,4	11,4
Plane length, m	6	6	6
Wheelbase, m	4,58	4,58	4,58
Wheel track, m	1,58	1,58	1,58
Maximum level speed, km/h	195	192	190
Cruising speed, km/h	160...180	160...180	160...180
Stalling speed, km/h	65	70	73
Maximum rate-of-climb, m/s	6,0	5,4	4,5
Service ceiling, m	6900	6300	5500
Maximum range, km	570	650	530
G limits	−3; +6	−3; +6	−2; +4
Rate of roll, radian/s	2,5	2,5	2,5
Min ground strength, g/sm <sup>2</sup>	3	3	4
Take-off run (G=max), m	80	100	170
Landing run, m	65	80	120
Speed at liftoff, km/h	70	73	77
Landing speed, km/h	70	73	75
Empty weight, kg	305	320	320
Fuel tank capacity, l	70	70	70
Engine power, hp	100	100	100

**Notice:**

*All specifications are given for MAI-223 with Rotax 912S installed and with two 77-kg pilots.*

# MAI -223SKh



**MAI -223SKh** is a crop-sprayer version of **MAI -223 airplane**.

## Crop spraying equipment:

- 160-liter tank for chemicals
- filters
- control set
- rods
- shut-off cock
- 2 electrical pumps
- lever-meter
- atomizers with shut-off valves and flow regulators

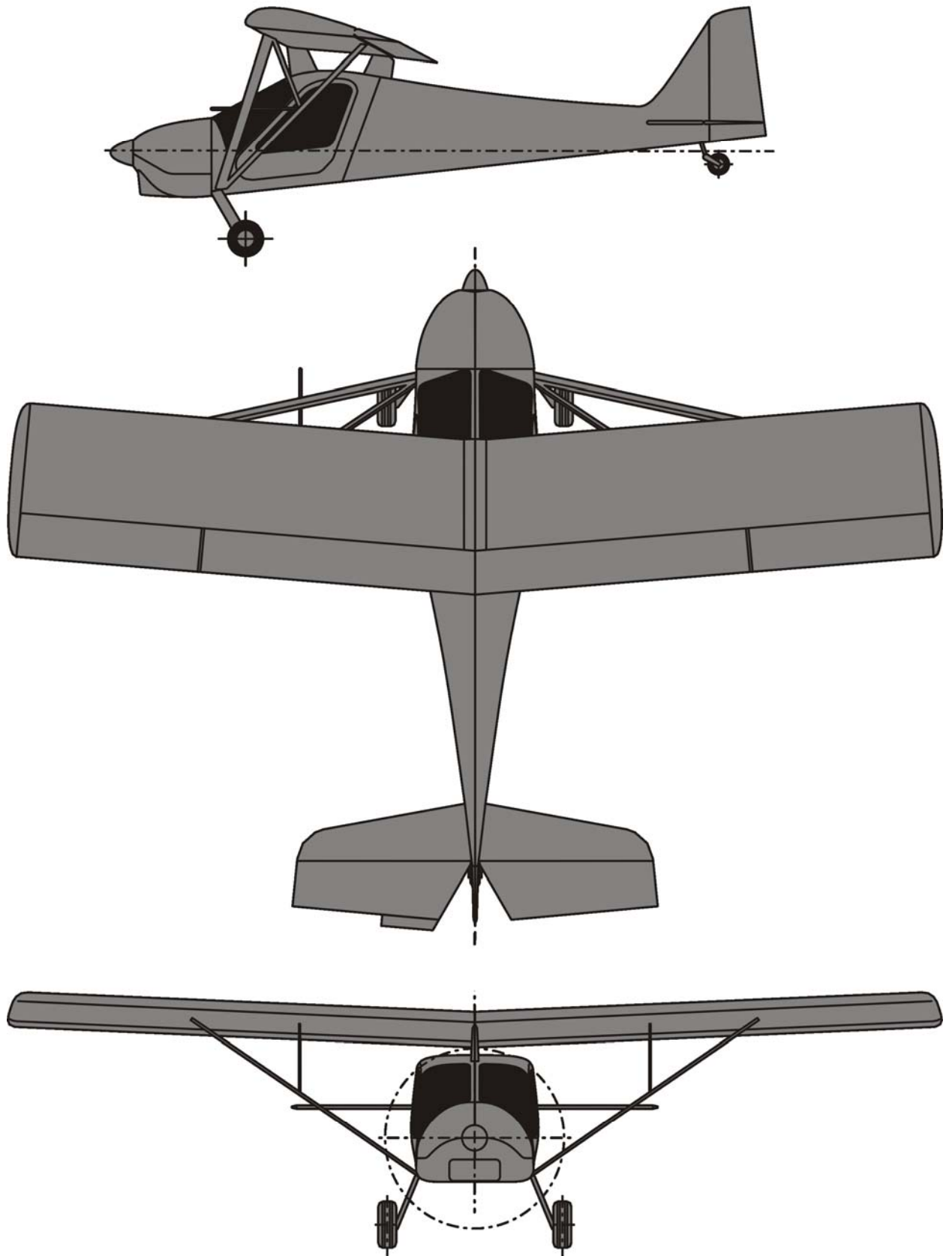
## General performance of MAI-223SKh

Plane width, m	8,56
Wing area, m <sup>2</sup>	11,4
Plane length, m	6,15
Wheelbase, m	4,58
Wheel track, m	1,58
Maximum level speed, km/h	163
Cruising speed, km/h	120...140
Stalling speed (landing configuration), km/h	78
Maximum rate-of-climb, m/s	3,3
Service ceiling, m	3300
G limits	—2; +4
Min ground strength, g/sm <sup>2</sup>	3
Take-off run (G=max), m	205
Landing run, m	87
Speed at liftoff, km/h	88
Landing speed, km/h	70
Empty weight, kg	362
Max takeoff weight, kg	630
Fuel tank capacity, l	70
Engine power, hp	100

## Crop spraying specifications

Flow norm, liter/hectare	0.5...20
Time of the preparation to the next flight, min	3
Tank volume, liter	160
Average speed while dusting, km/h	120
Swath, m	25
Time of U-turn, sec	30
Time of 1 hectare dusting (depends on flight speed), min	~ 0.48
Average productivity, hectare/h	124
Average productivity (6 hours per day), hectare/day	~ 743
Petrol consumption, liter/h	18

# General view





# Airplane developer



An airplane has been designed at Design Bureau of Moscow Aviation Institute (**OSKBES MAI** [www.oskbes.ru](http://www.oskbes.ru)), which was one of the first enterprises in Russia officially authorised to design light civil aircraft.

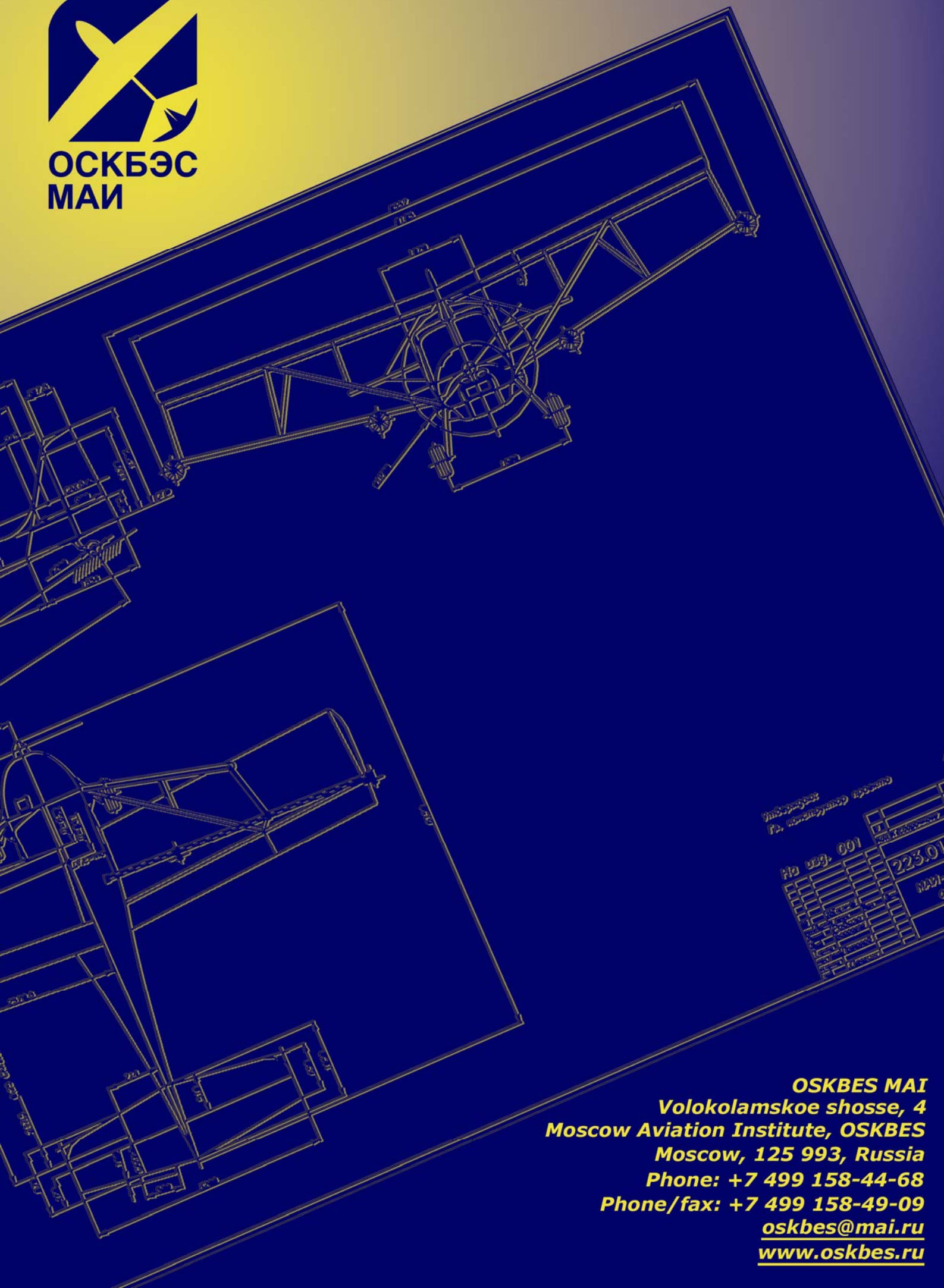
*Kvant* Airplane set 5 official world records during 1978-1980, and *Acrobat Aviatika-MAI-900* won higher aerobatics Grand Prix in 2005.

For one of the latest designs – *Aviatika-MAI-890* series airplanes put in series production at Russian Aircraft Corporation "MiG" a team of authors was awarded the State Prize of Russian Federation entrusted by V. Putin. The appearance on the market of "890" airplane was named as "Perestroika in Ultralights".





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