



sky  
without limits

**Orka**



**MARGAŃSKI & MYŚŁOWSKI  
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Sp. z o.o.

# EM11 ORKA

## SHORT CHARACTERISTICS

**ORKA** is a four seater twin-engine aircraft with retractable landing gear, high-wing configuration with push-type propellers and comfortable passenger cabin.

The aircraft is adjusted to VFR flights during daytime and at night, in future it is planned to fulfill the requirements of IFR. Shell structure is all-composite with honeycomb filler. Wings have foldable tips for easier hangaring. Two fuel tanks of 200 litres capacity each are installed in wings.

Fuselage has upwards-opening door in the front part and cargo hatch in the central part. Passenger cabin has four separate seats, of which the front ones are reclining and sliding. The seats have 3-point inertial safety belts. Vertical tail unit is mounted on fuselage. Tail plane is in T type. Electrical trimming tabs are mounted on both planes. Flight control systems are controlled by a rigid push-rod transmission system, the rudder is controlled with use of a line. The aircraft is propelled by two counter-rotating engines LYCOMING IO-320 / LIO-320 of 160 HP each at 2,700 RPM. Such a solution eliminates the so-called "critical engine", which significantly facilitates controlling the aircraft in the event that one of the engines shuts down. 3-blade constant-speed type propellers are manufactured by MT-Propeller.

Hydraulically retracted landing gear is mounted on fuselage and has gas shock absorbers with hydraulic damping. It greatly improves the comfort of landing and take-off on grass airfields of bad quality and uneven surface.

### APPLICATION

#### For business

Need more time? Organize meetings with clients wherever and whenever you want. Orka will make it possible. Combination of speed, safety and comfort makes business trips more effective. Moreover, wonderful and unforgettable impressions thanks to panoramic views will give new quality to any type of business. Comfort in the cabin during the flight is the result of low noise level.

#### Air taxi

Passenger cabin with very good access enables using the aircraft as a tool providing comfortable, fast and fully disposable means of transport over long distances. It is possible to re-construct the passenger cabin into a cargo cabin, which makes it possible to use the space in any optional way.



#### **For family**

This four-seater with spacious cabin is a serious alternative for long car trips both in one country and abroad. It may take-off and land on any airfield, including unpaved surfaces, which makes it much easier to organize flights. In addition to that, the speed, comfort, range, cargo carrying capacity and safety facilitate travelling to dream-places.

#### **For training**

This twin-engine aircraft with popular Lycoming engines and retractable landing gear is an ideal solution both for training centres and aviation companies that want to raise qualifications of their pilots. It provides perfect conditions of training on multi-engine aircraft, very good performance, high level of safety and comfort of flight for a very affordable price and reasonable costs of operation. Dual control system, excellent visibility and low noise inside the cabin creates ideal conditions for training both the student and the pilot.

#### **For patrolling**

Twin-engine aircraft with wide safety margin of long distance range enabling long-time flights and panoramic visibility from the cabin is perfectly suited to perform tasks of a patrol aircraft. If combined with possibility of installing wide range of surveillance and reconnaissance equipment, we obtain an ideal tool for companies and services which need to perform such tasks in a cheap and reliable way. Fuselage monocoque structure is convenient to modify and build an additional equipment on the plane.



# CONSTRUCTION

## AIRFRAME

**Wing:** single spar, non-split structure with short auxiliary rear spar. Double torque box with sandwich type skin. Wing consist of 10.5 m span mid-wing panel and two (left/right) tips of 1.5 m each, for hanging folded under the mid-wing. Folded/detachable tips allow transport of the airplane inside the 40ft container. In front of the main spar the fuel tanks (L/R) with capacity of 200 liters each are provided.

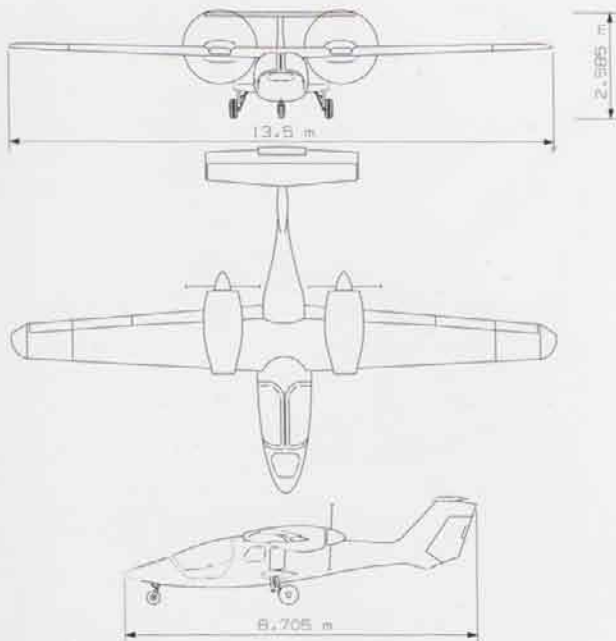
**Ailerons:** friese type, two-panel, constant chord, mass ballanced, equipped with fixed tab, carbon composite, sandwich structure.

**Flaps:** two-panel, in carbon composite, sandwich structure.

**Fuselage:** monocoque carbon composite sandwich structure with aramide honeycomb. Fin structure integrated with fuselage. On both sides the large upwards-swinging door and a baggage compartment access hatch door under the left wing. Front seats with reclining and slipping adjustment. Novel lay-out of the cabin compartment assures easy access and egress and excellent visibility during flight and ground operations. Airplane arrangement with power plants installed on a wing in pusher configuration results in exceptionally low noise level inside the cabin.

**Fin:** monocoque carbon composite sandwich structure. Mass ballanced rudder equipped with trim tab.

**Horizontal tailplane:** one-panel, T-type arrangement, carbon composite sandwich structure. Aerodynamic and mass ballanced elevator equipped with trim tab.



## POWERPLANT

**Engines:** two Lycoming IO-320-B1A and LIO-320-B1A four cylinder counter-rotating air cooled engines with fuel injection system, equipped with hydraulic constant speed governor, installed on a wing in pushing configuration.

**Propellers:** three-blade MT-PROPELLER model MTV-12-C-C-F/CFRD183-119d and MTV-12-C-C-F/CFRD183-119d, constant-speed, pusher type with feathering system.

## LANDING GEAR

Tricycle retractable with nose gear equipped with oil-gas type shock absorbers. Nose gear retracted forward, main side retracted into the fuselage compartment.

## CONTROL SYSTEMS

Ailerons, elevator – push-rod type mechanical system, flaps, trim tabs – operated electrically. Engines controlled by push-pull cables (Bowden) Lowering and retracting of the landing gear – hydraulic system.



# SPECIFICATION AND EQUIPMENT

## Basic technical and performance data

### Dimensions / weights:

Length	8.705 m	28.56 ft
Height	2.585 m	8.48 ft
Wing span	13.50 m	44.29 ft
Wing area	16.50 m <sup>2</sup>	177.61 ft <sup>2</sup>
Seats	4	
Maximum take-off weight	1820 kg	4012 lbs
Maximum useful load	550 kg	1212.55 lbs
Fuel capacity	400 lt	
Maximum range (with 45 mins navigation reserve)	1700 km	910 nm

### Performance:

Max. cruise speed in 5000 ft	289 km/h	156 kts
Cruise speed at 75% in 5000 ft	263 km/h	142 kts
Never exceed speed ( $V_{NE}$ )	350 km/h	189 kts
Landing speed	144 km/h	78 kts
Stall speed (landing configuration)	109 km/h	59 kts
Best rate of climb	5.0 m/s	1000 ft/min
Fuel consumption at 75% engine power	52 l/hour	
Take-off ground roll	390 m	1280 ft
Landing ground roll	410 m	1345 ft



## Basic equipment

<b>Engine</b>	Manufacturer: LYCOMING Model: IO-320-B1A / LIO-320-B1A Take-off performance: 160 hp/2700 rpm
<b>Propeller</b>	Manufacturer: MT - Propeller Type: constant speed Model: MTV-12-C-C-F/CFRD183-119d
<b>Avionics</b>	Garmin GMA-340 Garmin GNS-430 Garmin GNS-530 which is an optimum set of two radio transmitters/receivers, two VOR/ILS receivers and two GPS receivers, therefore, it enables full VFR/IFR navigation at day and night
<b>Transponder</b>	GTX 330 (with S mode)
<b>Flight instruments</b>	United Instruments, WUMA Instruments, R.C. ALLEN
<b>Engine instruments</b>	J.P. Instruments EDM900
<b>Other</b>	engine fire alarm system
<b>Brake system</b>	hydraulic Parker Hannifin, Goodridge
<b>Electrical system</b>	voltage 28V, two Kelly Aerospace alternators, 1 GILL battery equipped with ground power socket
<b>Fuel system</b>	mounted in wings of total capacity 400 l, two main fuel pumps, two auxiliary fuel pumps, tanks equipped with capacitive fuel gauges, low fuel level sensors
<b>Hydraulic system</b>	for retracting/lowering landing gear, constructed with use of Parker Hannifin components



## BENEFITS



### **Ergonomics and safety**

Getting on that plane is no problem even for a woman wearing long dress. See it for yourself – you will get inside ORKA as comfortably as into your car!

You don't have to wait until engines stop – thanks to propellers in pusher configuration, you will get off ORKA immediately after stopping on the airfield apron!

### **Cost of operation**

Cost of an hour of flight is \$177 and is 10% lower than the cost of a similar class aircraft (with assumption of 500h annual flying time, without costs of amortization).

### **Comfort of travelling**

Feel the comfort of travelling – in ORKA you can easily work or rest throughout entire flight! Exceptionally low noise level inside the cabin provides comfort during the flight.

Cabin provides perfect visibility all around. Enjoy the views without limits – from Orka cabin you can watch entire space, not only in front of the plane but also above and below!

### **Range up to 1,700 km**

The range is impressive for that class of aircraft – you can reach any destination within 1,700 km radius without intermediate landing!

### **PRICE**

Compare it to prices of other aircraft of that class – you'll see that the price is very competitive.

### **Possibility of landing on grass airfields**

Have you had problems landing on some airfields? Now, thanks to special structure of Orka landing gear, you can land also on grass airfields!







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