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1 INTRODUCTION

Scientific Production Unification "AEROVOLGA" (SPU "AEROVOLGA") was established in 2002. The main activities of the company include:

- Design and development aircraft;
- Aircraft manufacturing;
- Aircraft testing;
- Operation and MRO (Maintenance Repair and Overhaul) of the normal, multipurpose and aerobatic categories aircraft, designed by FAR-23, CS-23, AP-23, ultralights and experimental).

License (unlimited) to carry out the development, production, testing and repair of aircraft number 12889 - AT on April 9, 2014

At present the main activities of SPU "AEROVOLGA" are design and development of new amphibious aircraft LA- 8. First flight of amphibious aircraft LA-8 happened in November 2004.

Type certificat 2016 – LA-8C; 2017 – LA-8L.



Since 2013 the modification of the aircraft LA-8 C with engines LOM-PRAHA M-337C-AV-001, propeller MT-V-12 and the navigation and piloting complex Garmin -500, GTN-650, autopilot, radio altimeter has a base.

Since 2016 the modification of the aircraft LA-8 L with engines lycoming IO-540-D4A5.

Since 2018 EFIS Garmin – 500 TXI; ADSB in & out.

2 TECHNICAL SPECIFICATION

2.1 Basic data

2.1.1 General description and versions

Amphibian aircraft LA-8 is a general purposes aircraft. It's design allows following application:

- passenger traffic (up to 7 pax)
- cargo traffic (up to 800 kg)
- sea search and rescue operations

Three basic versions are available:

- (1) LA-8C, basic model with M-337C-AV-001 engines, 235 HP per each.
- (2) LA-8L, basic model with LYCOMING IO-540D4B5 engines, 260 HP per each.

LA-8 is high wing amphibian with tricycle retractable landing gear. Main access door (main hatch) is located in rear part of fuselage, on the upper side. Emergency exits are located on left and right sides near 1-st seats row (pilot and co-pilot seats), also see layout drawing.

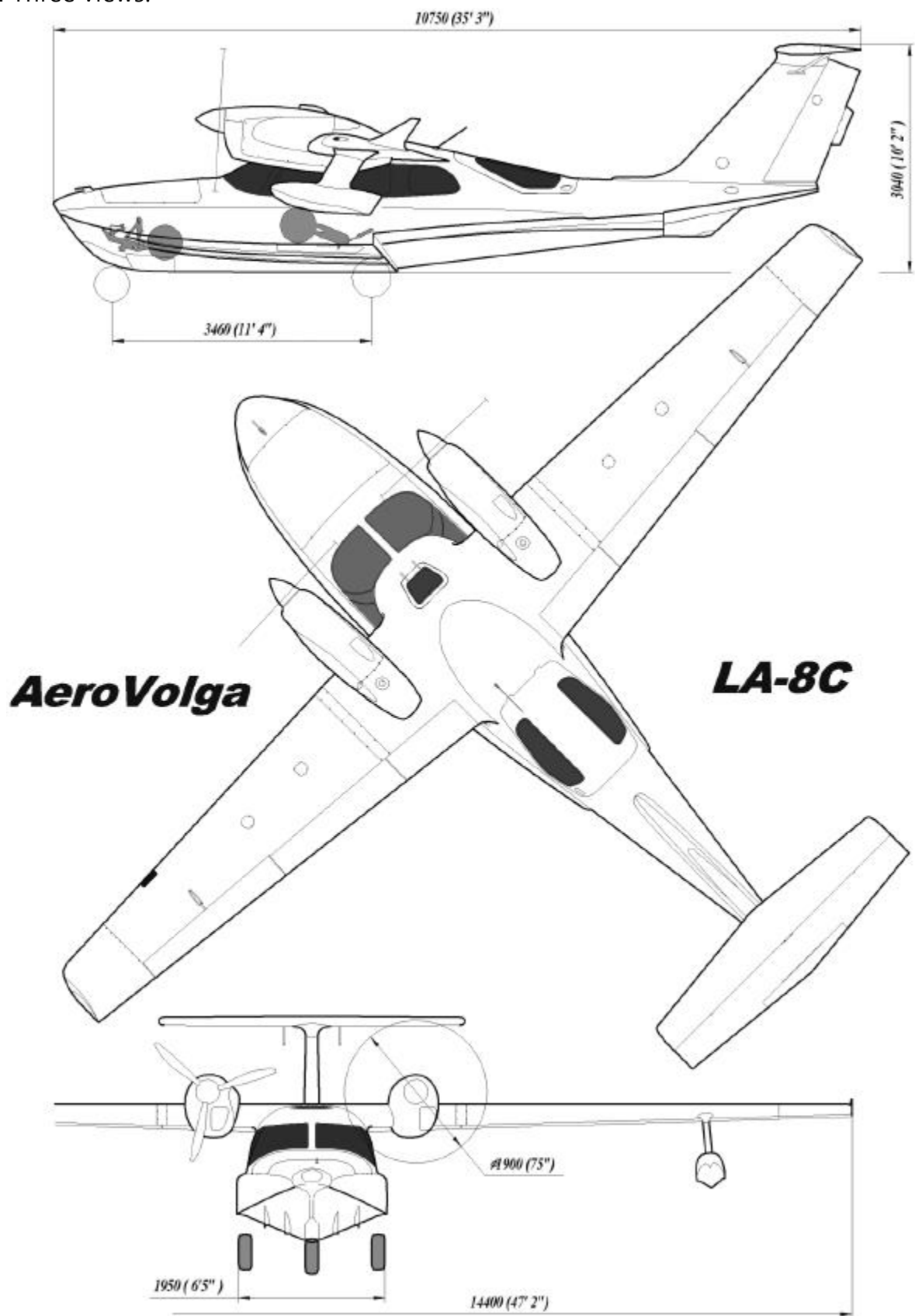
Airframe is all-composite. Metal parts are made of aluminum alloys with high resistance against corrosion, or of stainless steel.

Powerplants:

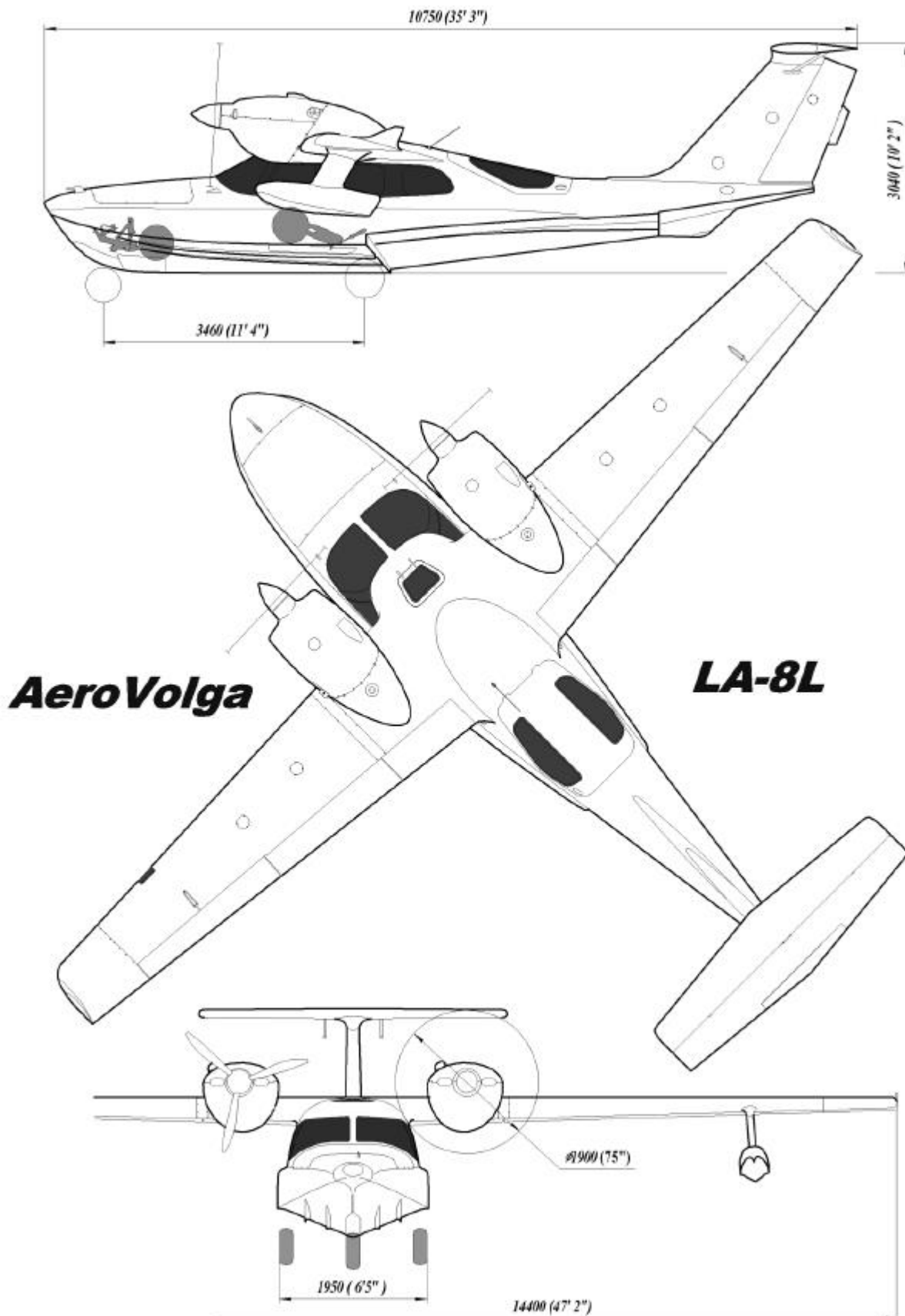
LYCOMING IO-540D4B5	LOM PRAHA M-337C AV-001
260 HP/2700RPM. Six-cylinders, opposite type, air cooled, free-breathed, injector. Approved fuel is AVGAS-100 or AVGAS-100LL.	235HP/2800RPM. Six-cylinders in-line type, air cooled, super- charged, timing injector. Approved fuel is AVGAS-100 or AVGAS100LL, or automotive gasoline

Propeller constant speed, hydraulically controlled, with feathering and reverse possibility, with or without de-icing system. For more convenient water operation «zero thrust» mode is available.

2.1.2 Three views:

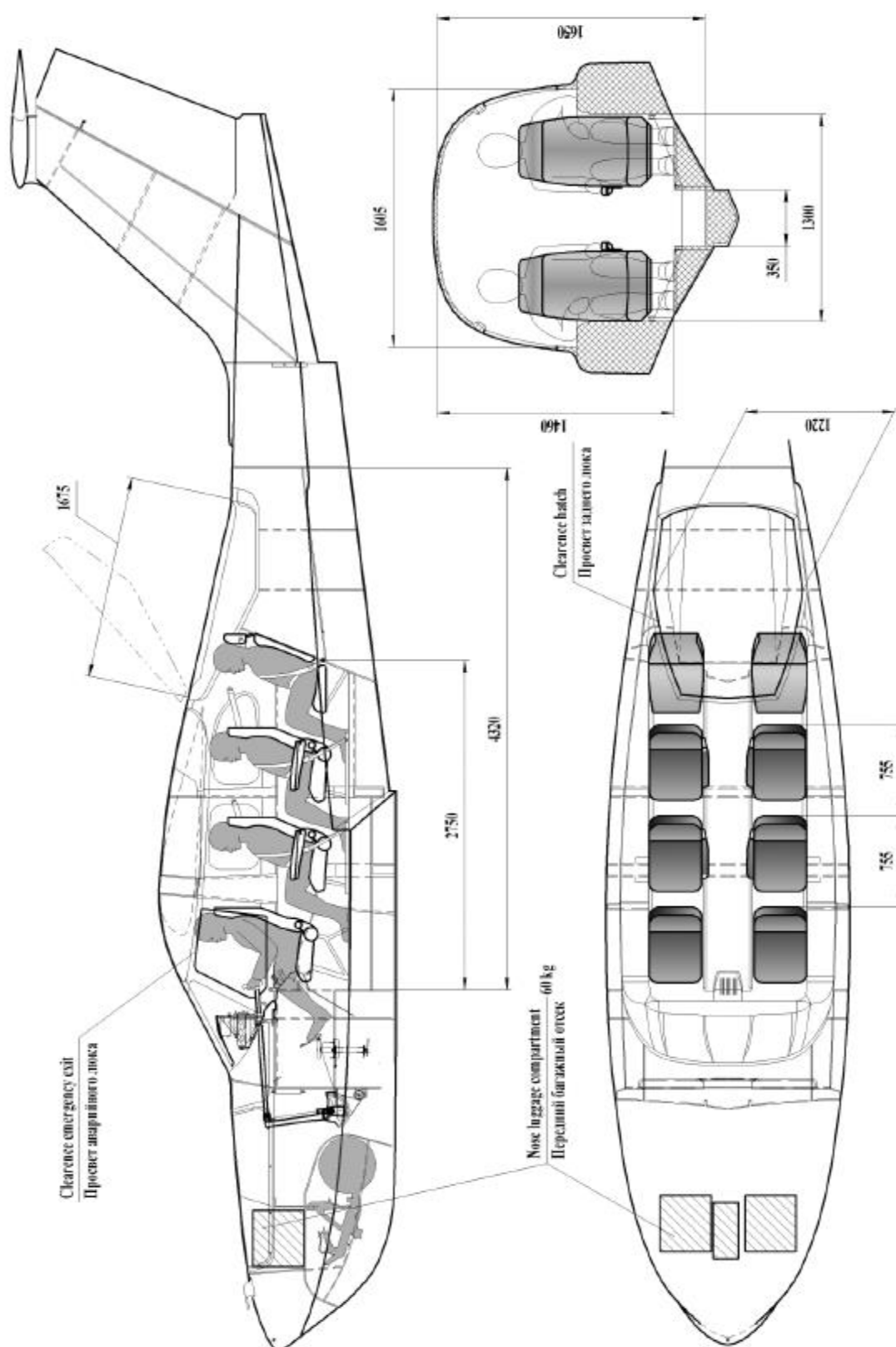


(a) LA-8C

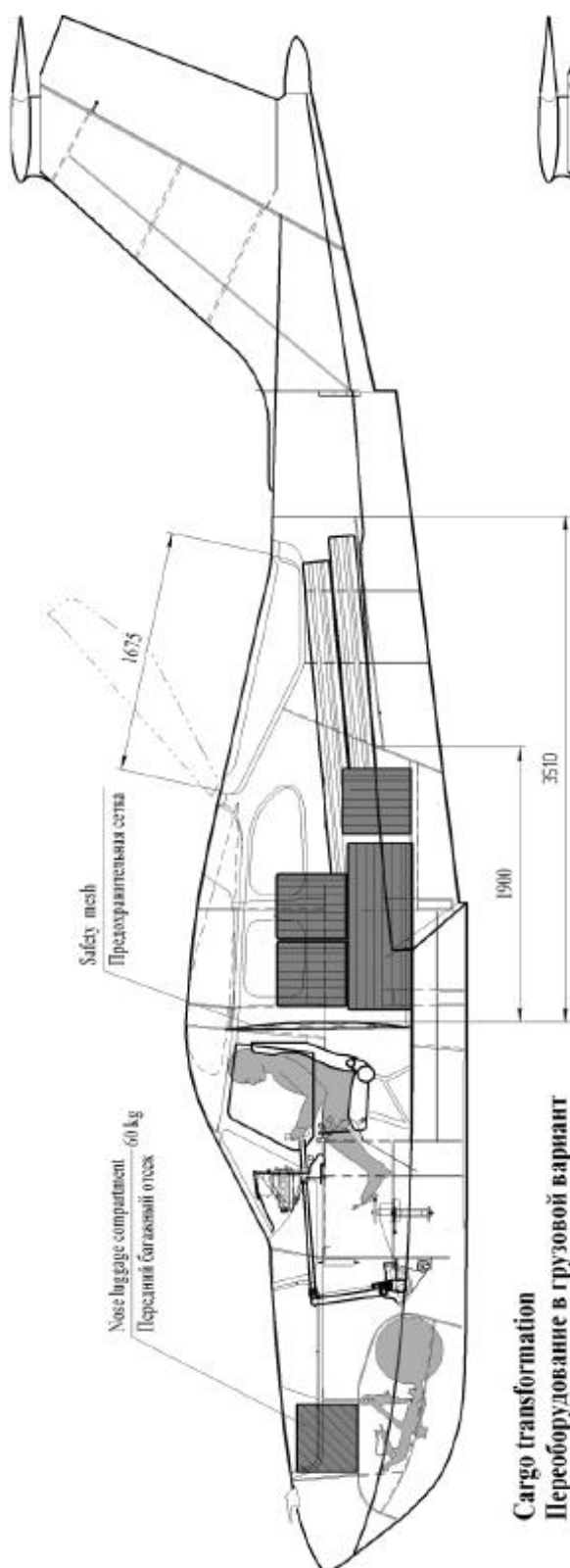


(b) LA-8L

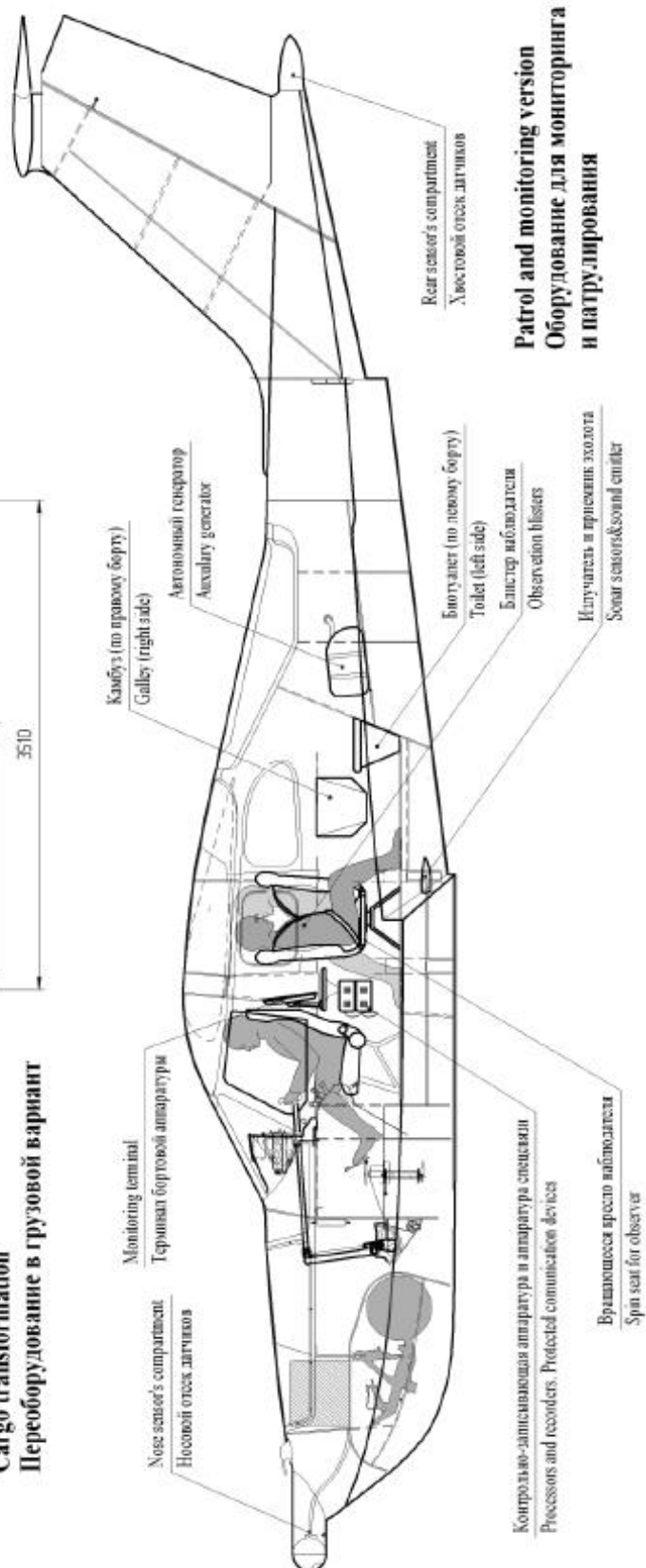
2.1.3 Layout



(a) Passenger version - eight seats (LA-8C, LA-8L)



Cargo transformation
Переоборудование в грузовой вариант



Patrol and monitoring version
Оборудование для мониторинга и патрулирования

(b) Cargo transformation and monitoring version (LA-8C, LA-8L)

2.1.4 Main dimensions

Dimensions	LA-8C, LA-8L
Length, m	10,65
Wing span, m	14,00
Ramp height, m	3,48
Maximum width of fuselage, m	2,00
Track of landing gear, m	1,78
Wheelbase of landing gear, m	3,41
Wing area, sq. m	20,2
Cabin dimensions	
Length total, m	4,02
Length of cockpit, m	2,45
Height, m	1,55
Width, m	1,61
Cabin capacity, cu. m	4,00
Rear access hatch, clearance, m	1,67x1,22
Emergency hatches clearance (left, right), m	0,68x0,68

2.1.5 Weight and loads

Description	LA-8C	LA-8L
Max. TOW, kg (Lb)	2720 (6000)	2720 (6000)
Max. ramp weight, kg (Lb)	2720 (6000)	2720 (6000)
Empty weight, kg (Lb)*	1790 (3946)	1810 (3990)
Fuel capacity, kg (Lb)***	315 (873)	315 (873)
Max. useful load, kg (Lb)	930(2054)	910 (2010)
Max. number of men-on-board	8	8
Min crew	1	1
Max. cargo weight, kg (Lb)**	950 (2094)	920 (2028)

*Empty weight for basic equipment set

* In the cargo version Empty weight 1610 kg (3549)*** standard tanks; options -75 kg more (165)

2.1.6 Operations limits

Description	LA-8 C	LA-8L
Never exceeded airspeed V_{ne} , km/h (kTs) IAS	280 (150)	280 (150)
Maneuvers speed V_A , km/h (kTs) IAS	260 (140)	260 (140)
Stall speed V_{so} , km/h (kTs) IAS	112 (60)	112 (60)
Maximum load factor, g-units	+3,8...-1,52	+3,8...-1,52
MWTO	2720	2720
Maximum approved altitude, m (feet)	3000 (10 000)	3000 (10 000)
MAX. AIRPORT ALTITUDE, M (Feet)*	1700 (5578)	1500 (5000)
Max. wave height for sea operation, m (inch)	0,5 (20)	0,5 (20)
Max. crosswind, m/sec (kTs)	15 (30)	15 (30)
Min. depth for on-water operations, m (feet)	0,5 (20)	0,5 (20)

*2500 m (8200) with LOM – 337C-AV-003

2.1.7 Performances

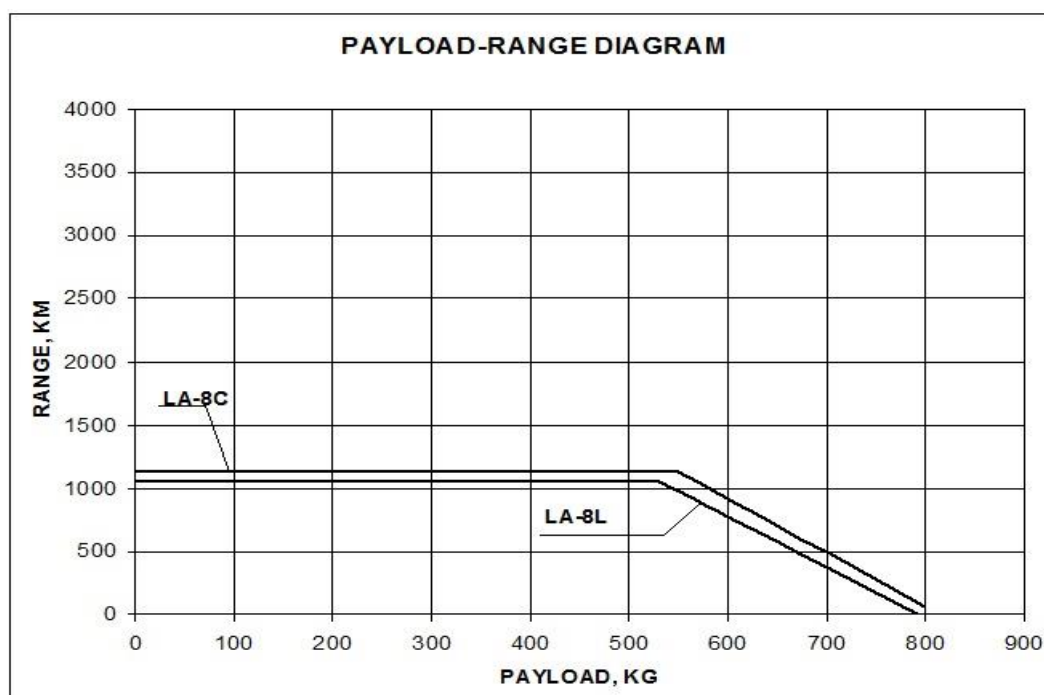
Important: All data for standard conditions and max. t.o.w., unless specified otherwise. Operation range is defined for standard flight procedures and 45-min fuel reserve.

Max. ferry and duration are obtained for optimal flying procedures, altitudes and engine modes.

	LA-8C	LA-8L
Maximum cruise speed km/h (kTs) TAS	260 (140)	265 (143)
Cruise speed (economy) km/h (kTs) IAS at SL	213 (115)	222 (120)
Landing speed, km/h (kT) IAS	111 (60)	111 (60)
Take-off run m (feet)	400 (1312)	400 (1312)
Roll length, m (feet) without reverse	320 (1070)	320 (1070)
Roll length, m (feet) with reverse	210 (700)	210 (700)
Rate of climb, m/sec (ft/min) **	3,5 (700)	4,0 (800)
Celling, m (ft)	3000(10000)	3000(10000)
Max.available ferrying distance, km (nm)*	1000 (648)*	900 (540)*
Max. available duration of flight, hours*	5,6	5,0

*Without additional tanks. At 2100 m altitude (6900) and standard weather condition, IAS 180km/h (97 knots),no reserve

**Rate of climb range from max.TOW.



Payload – Range dependence for different versions

2.2 Avionics and equipment

2.2.1 General

Basic (standard) avionics set provide the IFR operation. Weight of basic equipment is included in standard empty weight.

The aircraft may be equipped with additional (optional) avionics. This configuration means special architecture of power supply system and air pressure system, in consideration with FAR-23 requirement.

Weight of additional equipment and supply system will be added to standard empty weight.

Configuration of additional avionics will be specified with Customer

2.2.2 Equipment (Fig.7), standard

Optional equipment does not always mean an additional price. Part of the additional equipment for different versions is included in base price, however the weight of optional equipment must be added to empty weight.

Free optional equipment for all versions:

Attitude indicator, base or standby

OAT indication

STALL indicator and buzzer

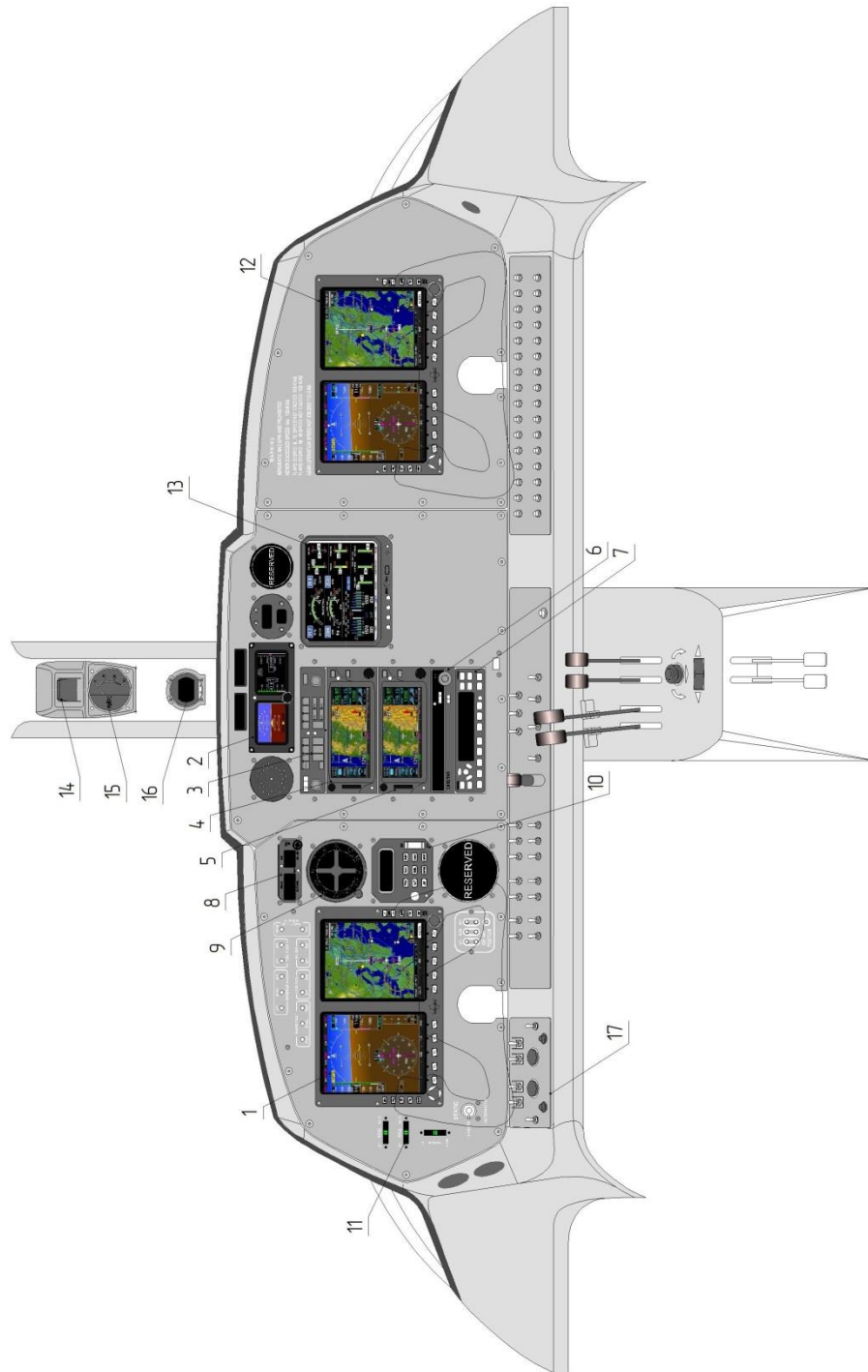
Watch

Full list of optional equipment consists of 79 items and includes confirmed list of units, terms, prices and weights. This list is a contract appendix, all terms will be determined in contract negotiations.

The list below is the standard:

- 1 – primary flight display (PFD) GARMIN G500 TXI left
 - 2 – standby module
 - 3 – audiopanel with marker beacon alarm GMA-340 (or analog)
 - 4 – primary navigation GTN-650
 - GPS
 - VHF transceiver
 - VOR (indication on PFD)
 - ILS (indication on PFD)
 - DME indication**
 - Traffic control ADSB "in & out" - **
 - TAWS
 - satellite communication (not for Russia and China)**
 - airport charts
 - 5 – secondary navigation GTN-650**, secondary NAV/com, SL-30
 - 6 – REZERV
 - 7 – mode "S" transponder (secondary option)
 - 8 – radar altimeter
 - 9 – Rezerv
 - 10 – 3-axis 5-channel autopilot navigation/pitch/yaw/roll/ autotrim
 - 11 – trim indicator
 - 12 - primary flight display (PFD) GARMIN G500 right
- Devices or systems can be replaced with equivalent by manufacturer
13. EMS (EDM) (EMI)
 14. flaps control
 15. Flaps position indicator
 16. magnetic compass
 17. engine control panel

** optional



The sample of optional avionics and instruments layout (Fig.7)

Rescue equipment

- life jacket for each passenger and pilot - standard

De-icing system, witch include:

- Heating windshield left Pilot (option)
- Hitting Pito – standard; Hitting SWS - standard

Powerplant options

- Zero thrust mode, for more convenient marine operations*

2.3 Certification schedule

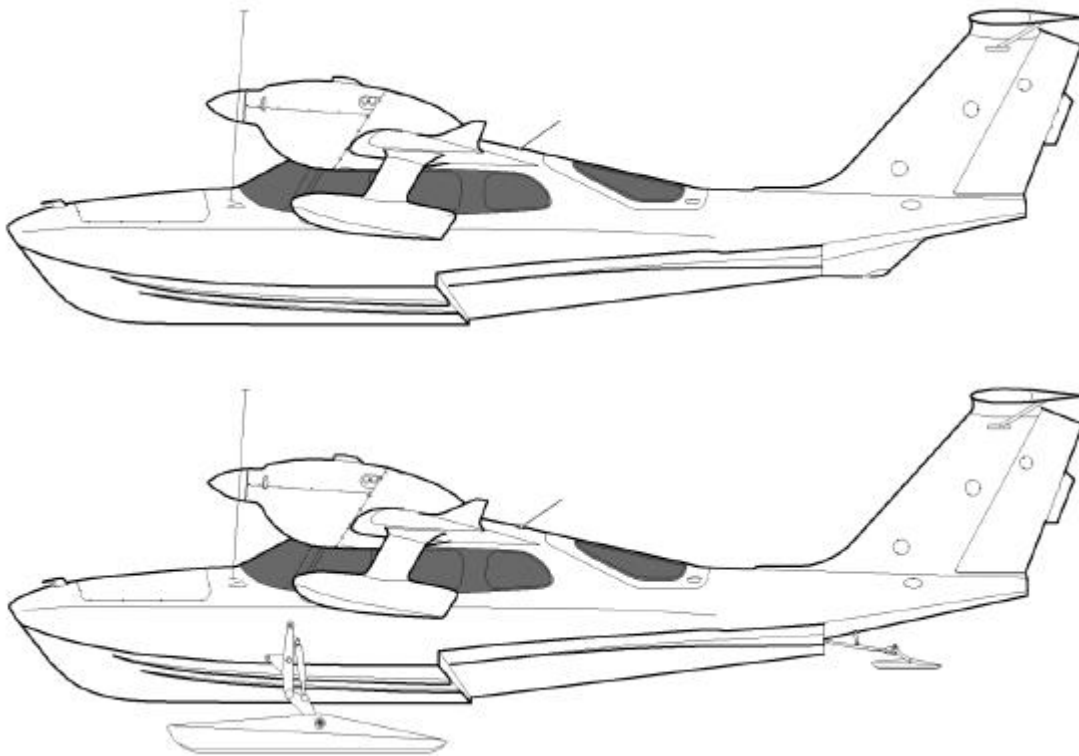
At present time the manufacturer is delivering LA-8 amphibian aircraft under "§23" certificate or withaout.

2.4 Beyond solutions

For special missions are available deep modifications of any basic versions of LA-8 amphibians. Two examples of they are showed below.

2.4.1 Hydroplane

For regular coast operations or island traffic may be preferable the configuration without retractable landing gear. This feature will make a possible the augment of payload, as compared with any basic amphibian version, to 160 kg, without reduction of any other performances.



The basic equipment for Hydroplane version is including fast mounted undercarriage, for towing from water to the land. Every undercarriage module attaching to the fuselage's fittings by thread pins. The design of undercarriage makes a solution to operate from earth or to snow. For lust cause ski set is necessary.

Please get your attention to the ski landing gear layout. This is taildragger type instead basic tricycle, because taildragger skies allow operate from deep and wet snow. Removable main struts equipped with standard shock absorber, aft landing gear is spring.

3 INTEGRATED LOGISTICS SUPPORT

3.1 LA-8 product support

SPU "Aerovolga" provides the Customers operating LA-8 aircraft with a package of product support services to ensure safe, continuous and cost-effective operation of aircraft:

For this purpose, the Supplier and the Customer shall arrange interaction on the following main issues:

Information support

- Information support (information systems, integration of information systems, SW support);
- Technical publications; service bulletins, drawings

Technical support

- Warranty in accordance with the contractual obligations;
- Field service representatives (FSR) in main base operation;
- Engineering support;
- AOG support;
- Periodic scheduled maintenance, including C-checks, overhaul and modifications

Logistic support

- Initial provisioning;
- Follow-on delivery of spare parts and ground support equipment

Training

- Training and retraining;

Disposal

- Disposal of aircraft and its components

Detailed description of Operator-oriented directions of ILS activity is presented below in the associated sections.

3.2 Supplier's policy

During operation of LA-8 aircraft, Supplier is to fulfill the following tasks (based on Supplier's plans and programs as well as information provided by Operator) related to increase of aircraft efficiency and reduction of life cycle cost:

- Development and implementation of activities related to improvement of aircraft structure, maintainability and reparability, technical publications.
- Improvement of technical efficiency, expansion of aircraft applicability, increase of cost-effective ratio, including reduction of aircraft operational costs.
- Study of in-service experience, identification of the following trends: change of aircraft operational status, in-flight reliability and safety.
- Identification of design and manufacturing defects, malfunction detection, causes of malfunctions, steps to be taken to eliminate malfunctions.
- Development of optimum maintenance system, nomenclature of spares, spares requirements, in order to achieve optimum spares quantity.
- Arrangement and carrying-out of activities related to validation and extension of aircraft service life.
- Refinement and optimization of life cycle cost.

3.3 Warranties

The Customer has twelve (12) months warranty from the date of the delivery of LA-8 aircraft and the equipment covering any defects under normal use and service.

3.4 Field Service Representatives

During guaranty period the SPU "AEROVOLGA" can arrange Field Service Representatives (FSR) services to be provided to the Customer at main base of operation in the country of the Customer. This FSR service is included at extra charge to the Customer.

The Supplier responsibility shall be to provide technical advice to the Customer's personnel during the initial period of the aircraft operations in areas such as line maintenance, troubleshooting, etc.

The number of FSR and their terms of staying will be defined at the contractual negotiations.

3.5 Spare parts and tooling supplies

SPU "AEROVOLGA" as the Supplier of Aircraft and Equipment shall provide the Customer with spare parts, ground equipment, tools and materials during the service life of the aircraft under separate contracts.

3.6 Maintenance, repair and overhaul (MRO)

SPU "AEROVOLGA" offers to LA-8 aircraft Customers the follow variant of maintenance:

- Customer performs line maintenance and periodic checks.
- SPU "AEROVOLGA" performs Heavy checks in concordance with separate contract.

3.7 LA-8 maintenance concept.

3.7.1 General

The concept of maintenance of LA-8 aircraft powered with TP-100; M337C-AV-001, Or IO-540D4B5 engines is based on advanced methods, developed in accordance with Russian and International standards, and principles providing effective and safe aircraft operation due to timely, qualitative and full-scope completion of all kinds of required maintenance including preventive inspections of aircraft systems, units and equipment.

The presented maintenance concept (inspections intervals, tasks scope, etc.) can be optimized/tailored with respect to specific requirements of Customer, e.g. aircraft missions, flight profiles, annual flying time, deployment scenarios and other.

3.7.2 Maintenance categories

LA-8 aircraft requires the following maintenance:

- Scheduled maintenance:
- Line maintenance (in the field) : preflight maintenance; after flight maintenance;
- Periodic maintenance: every 50 ± 5 FH or 6 month ± 15 days;
- Unscheduled (corrective) maintenance:
- Storage maintenance: every (30+5), (90+10), (180+30) days of storage;
- Special maintenance.

3.7.3 Unscheduled maintenance

Special maintenance is performed when the aircraft gets into special/abnormal operation conditions in flight and on ground.

Special/abnormal situations imply the following:

- rough landing;
- overweight landing;
- flight in severe turbulence zone;
- aircraft getting into thunderstorm (lightning strike effect on aircraft);
- bird strike and collision with other foreign objects;
- aircraft getting into hail, etc.
- implementation of service bulletins.

Special maintenance includes procedures performed during hangar maintenance of aircraft (system) and troubleshooting. Inspection/check procedures are assigned from the list of hangar maintenance procedures, depending on abnormal situation occurred.

3.7.4 Storage Maintenance

Storage maintenance is required for the aircraft during long idle time in order to maintain the operational status of systems, units and equipment. Storage maintenance includes procedures of preparation for storage and procedures performed during the aircraft storage.

For scheduled and unscheduled idle time periods of more than 30 days the maintenance system assigns specific storage maintenance procedures (preparation for storage and procedures performed during storage).

Storage maintenance procedures intervals are as follows: 30 ± 5 days, 90 ± 10 days and 180 ± 30 days of storage.

During the aircraft storage in the open areas, procedures for ventilation of the aircraft compartments are carried out at 15 ± 2 days intervals.

The scope of storage procedures depends on the period of storage. Storage maintenance includes such tasks as aircraft covering, preservation of aircraft systems, equipment and airframe, preventive maintenance on moisture removal, prevention of corrosion and deterioration of polymeric materials.

3.8 Obtained spare parts and tools

3.8.1 General

The initial provision includes set of spare parts, ground support equipment of common and special application, ground test equipment of common and special application and tools required to accomplish works on line and periodic (hangar) maintenance of the LA-8 aircraft in conditions of ground airfields and hydrodromes, and should be included in the addendum to the contract .

3.8.2 Concurrent spare parts

The nomenclature of concurrent spare parts recommended to provide LA-8 aircraft maintenance for three (3) years (300 flight hours annually) of operation TBD at the contractual negotiations.

3.8.3 Tools

The nomenclature of Tools required for LA-8 aircraft maintenance TBD at the contractual negotiations.

3.9 Publications

3.9.1 General

Technical publications (TP) are developed in simplified technical Russian and translated into simplified English (ASD SE).

3.9.2 Revision procedure

Revision of TP is provided if any through annual bulletin submitted to the Customer.

The bulletins issued to revise Maintenance Manual and Technical publications in order to correct the mistakes or to avoid flight incident due to failure of equipment will be supplied by the Russian side free of charge.

3.9.3 TP distribution

Technical publications will be delivered by e-mail in PDF format. Solid copy of publication are available if customer has acquired.

3.10 Training

3.10.1 General

Initial training of the Customer's flying personnel and technical staff shall be performed in SPU "AEROVOLGA" Training Center in Russia. The Training Center and the training programs are certified according to the Russian Standards. The training may be performed in Russian and in English (with interpreter). On completion of training the trainees will get the Certificates of a standard pattern of Russian Federation general aviation.

The details on the training requirement such as syllabus, period of training and costs shall be discussed during contract negotiation

3.10.2 Training content

Training is conducted in compliance with agreed and approved programs according to syllabus. Upon completion of each course, trainees will take credits. Credits are held in a form of multiple-choice examination or by using conventional test-papers.

Intermediate multiple-choice examination is held on separate topics of the courses to estimate the current progress of the trainees. Examination is conducted by means of interactive multimedia system that will determine skills rating.

"SAMARA" airfield and "SAMARA" hydrodrome are used to conduct practical training of flight personnel. Flight training is performed by SPU "AEROVOLGA" Training Center by involving the required instructors.

Flight training includes the following types of training:

- Ground training, during which trainees study flight training program procedures and features of flights performed in the airfield area. In the cockpit, mission tasks procedures and cockpit equipment operation are exercised, knowledge of AFM (emergency procedures and limitations) and knowledge of instruments, indicating devices and controls arrangement are examined;
- Flights from land. Training is conducted both in daytime and at night. Training objective is to exercise skills on aircraft handling during take-off and landing, aircraft handling in training flying area and during emergency procedures, as well as skill on crew co-ordination in flight;
- Flights from water. Training is conducted in daytime. Training objectives are as follows: to teach trainees to determine weather conditions of water surface in terms of take-off and landing possibility; to exercise aircraft taxiing on water, circulations, hydroplaning, take-off (from) and landing on the wind-generated wave and along wave ridge, as well as take-off and landing with crosswind and in extreme weather conditions.

Upon completion of each course, trainees shall take exams. Exams are provided to estimate level of knowledge acquired by the trainees.

Each trainee will obtain certificate that proves that trainee has successfully completed theoretical and hands-on training and is certified to perform activities in which he was trained.

4 COMMERCIAL TERMS AND CONDITIONS

SPU "AEROVOLGA"s budgetary proposal for the sale of LA-8 aircraft is made upon the following terms and conditions.

4.1 Subject Matter of sale

LA-8 aircraft in the basic version and the current production configuration as per Technical Specification.

Spare parts, tools, ground maintenance aids (GSE - ground test equipment and GTE - ground support equipment) hereinafter referred to as "Initial provision", described in section 4.5 of the present offer, and

Services rendered by the Supplier to the Customer namely training of the Customer's specialists for flight operation and technical maintenance of the Aircraft (hereinafter referred to as "Training"). Brief description of the recommended Training program is given in section 3.6 of the present offer.

4.2 Delivery schedule

The Supplier proposes the delivery of LA-8 aircraft in accordance with the following schedule: TBD

Delivery of aircraft shall be performed in accordance with the delivery schedule coordinated with the Customer. TBD

Initial provision Concurrent with aircraft deliveries unless otherwise agreed between the Parties. The scope of Initial provision would be defined following a meeting between both Parties. During the meeting the Customer's specific operational requirements would be analyzed and recommended list of Spares, Tools, GSE and GTE would be proposed by the Supplier.

Training To be initiated before the first aircraft delivery. The exact timing to be agreed between the Parties.

Depending on the results of inspection of the main operation base and forward operation base (if any) the Parties will discuss the peculiarities of aircraft deployment and the necessity of adaptation to the Customer infrastructure.

4.3 Terms of delivery

Standard delivery terms and conditions proposed to the Customer by the Supplier in the present offer are based upon the international terms and conditions (as per "INCOTERMS-2010").

LA-8



For notes

LA-8



For notes