FLIGHT MANUAL

ANG-01

AIRCRAFT

FLIGHT MANUAL

ANG.01.FM.01

Edition 1

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PART 1. INTRODUCTION

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CONTENT

Definition of terms

Critical and particular instructions are listed as the “CAUTION”, “WARNING”, and “NOTE” warnings in bold italic characters. The importance of the instructions is additionally emphasized by color marking (respectively red, brownish and green) of the text block. Below are definitions of each of these terms.

CAUTION means that a failure to comply with the appropriate procedure or conditions may result in an aircraft accident with serious consequences.

WARNING means that a failure to comply with the appropriate procedure or conditions may result in a damage to the aircraft or crew.

NOTICE draws attention to the particular circumstances that need to be emphasized, provides necessary information and explanatory material.

All numerical values are specified in the metric measurement system.

INTRODUCTION

The current Flight Manual is a document that provides specific rules for flight operation of ANG-01 type light aircraft to the extent, required for its safe operation.

Flight Manual for ANG-01 type light aircraft (hereinafter FM) is developed in accordance with the requirements of GOST 24867-81 "Manual for flight operation in civil aviation", format A5.

The FM contains the data necessary for flight operation of the aircraft about its structure and the functioning of systems, assemblies, units. The FM lists the failures that may result in severe accidents, and provides recommendations as for their mitigation or elimination.

FM is issued in Ukrainian and Enlish. The applicant may translate FM into another language at his own risk.

FM is the primary flight operational document governing the execution of flights by an aircraft of ANG-01 type. Flight operations not stipulated by FM, ARE FORBIDDEN.

The legal basis for operating an ANG-01 type aircraft of is the national law of the country of registration.

Current FM is not a substitute for a competent theoretical and practical training. Failure to comply with the FM provisions, as well as the lack of proper pilot training, may result in failure, loss of aircraft or tragic consequences.

The pilot is authorized to operate an ANG-01 type aircraft provided he is a bearer PPL or CPL licencies and only after a thorough perusal of the current FM.

The FM holder is the Designer and Manufacturer of the ANG-01 type aircraft, LLC “ANG “Patriot-Ukraina” (Brovary, Kyiv region, Ukraine), which is fully responsible for timely and correct introduction of all modifications and supplements to the FM.

For all questions about flight operation of the ANG-01 aircraft type contact the Developer’s Support team at **angpatriotua@ukr.net.** It is necessary to recurrently (at least once a month) check the Developer’s website angpatriotua.com for updates to the FM.

Modifications and supplements to the FM are issued in lieu of, or in addition to existing material in form of separate sheets of a standard pattern. These modifications or additions are entered in the Modification Sheet and List of Valid Pages. Modifications and supplements to the FM are indicated by a vertical bar on the margins on the right side opposite the modified part of the text or value. The text "Modification" is positioned at the left bottom part of the modified page, in the editorial line, with the number of the modification. Also, instead of the entry "Introduced" and the date of the previous edition, the text "Superseded" with a specified date is placed. The previous version of the modified page is withdrawn and deleted.

CAUTION Flight operations of ANG-01 type aircraft without FM ARE FORBIDDEN.

Acronyms

ADAHRS	-	Air Data and Attitude Heading Reference System
CS-23	-	Airworthiness standards
EASA	-	European Union Aviation Safety Agency
ECU	-	Engine control unit
ELA	-	European light aircraft
EMS	-	Engine monitoring system
STROBES	-	Aircraft flashing lights
V_2, V_{REF}	-	Typical takeoff and landing speeds
V_D	-	Design dive speed
V_{NO}	-	Maximum speed for normal operations
V_S	-	Stall speed
V_Y	-	Speed that will allow for the best rate of climb
ACB	-	Automatic circuit breaker
BANO	-	Airborne onboard fire
VZL	-	Engine condition - Take-off
VISH	-	Variable pitch propeller
VPS	-	Runway
GVPS	-	Dirt surface runway
FM	-	Flight Manual
MM	-	Maintenance Manual
LFP	-	Paint and varnish coating
MG	-	Engine condition - Idle
MP	-	Engine condition - Maximum continuous operation
ISA	-	International standard atmosphere
APS	-	Aircraft plane of symmetry
RV	-	Elevator
RN	-	Rudder
RUD	-	Throttle control lever
RUS	-	Aircraft control stick
MAC	-	Mean aerodynamic chord of the wing
SNS	-	Satellite navigation system
CHT	-	Engine cylinder head temperature
ShV	-	Landing gear extended
SHVPS	-	Runway with artificial pavement
ShP	-	Landing gear retracted

PART 2 DESCRIPTION OF THE DESIGN

CONTENT

Introduction

This part defines the classification and purpose of the ANG-01 type aircraft, its design details and the functional purpose of its main components.

The text and graphic material presented below is sufficient to represent the design of the ANG-01 type aircraft for executing safe flights.

2.1 Classification, purpose of the aircraft

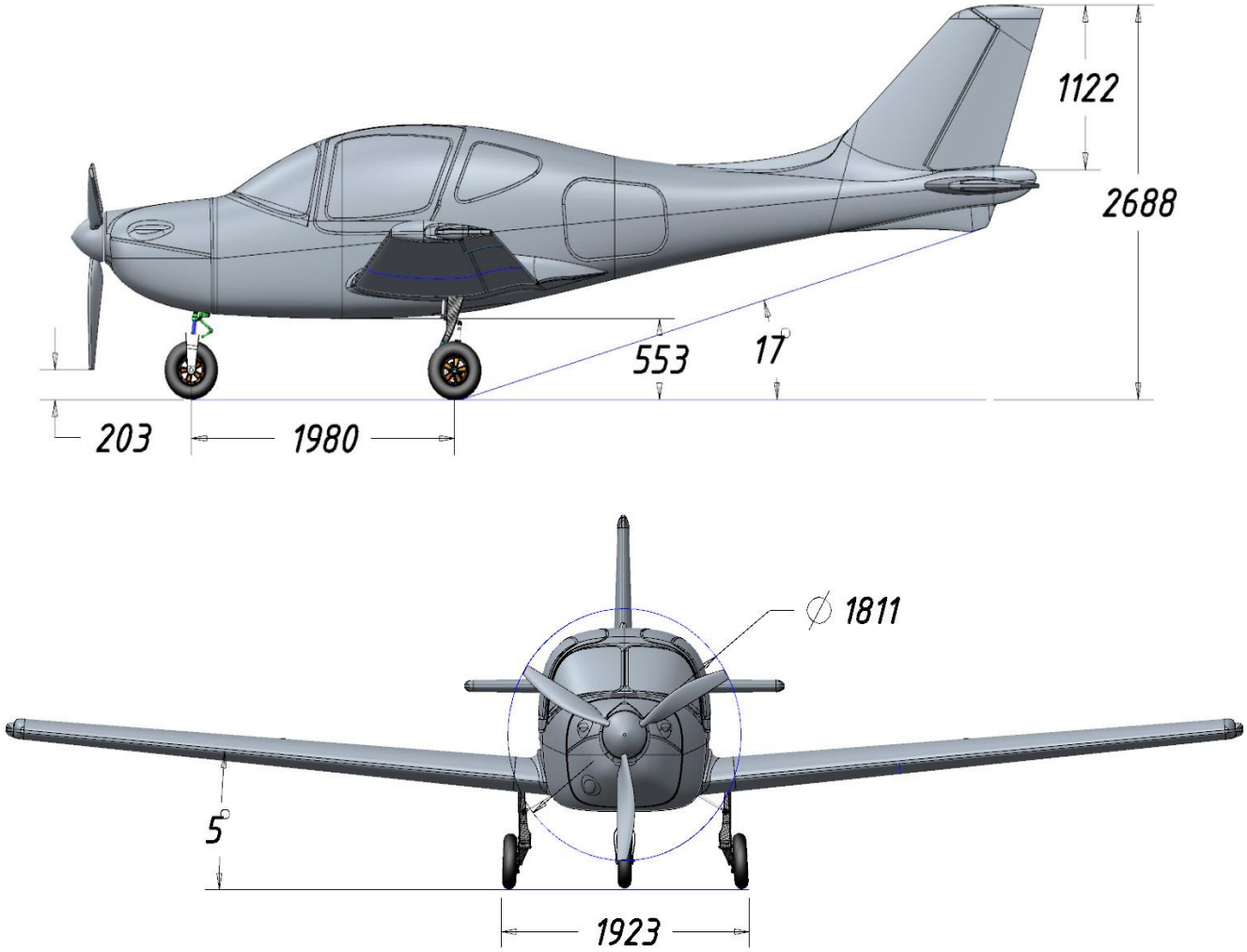
Aircraft type ANG-01 belongs to the class ELA1 (with a maximum take-off mass up to 1200 kg).

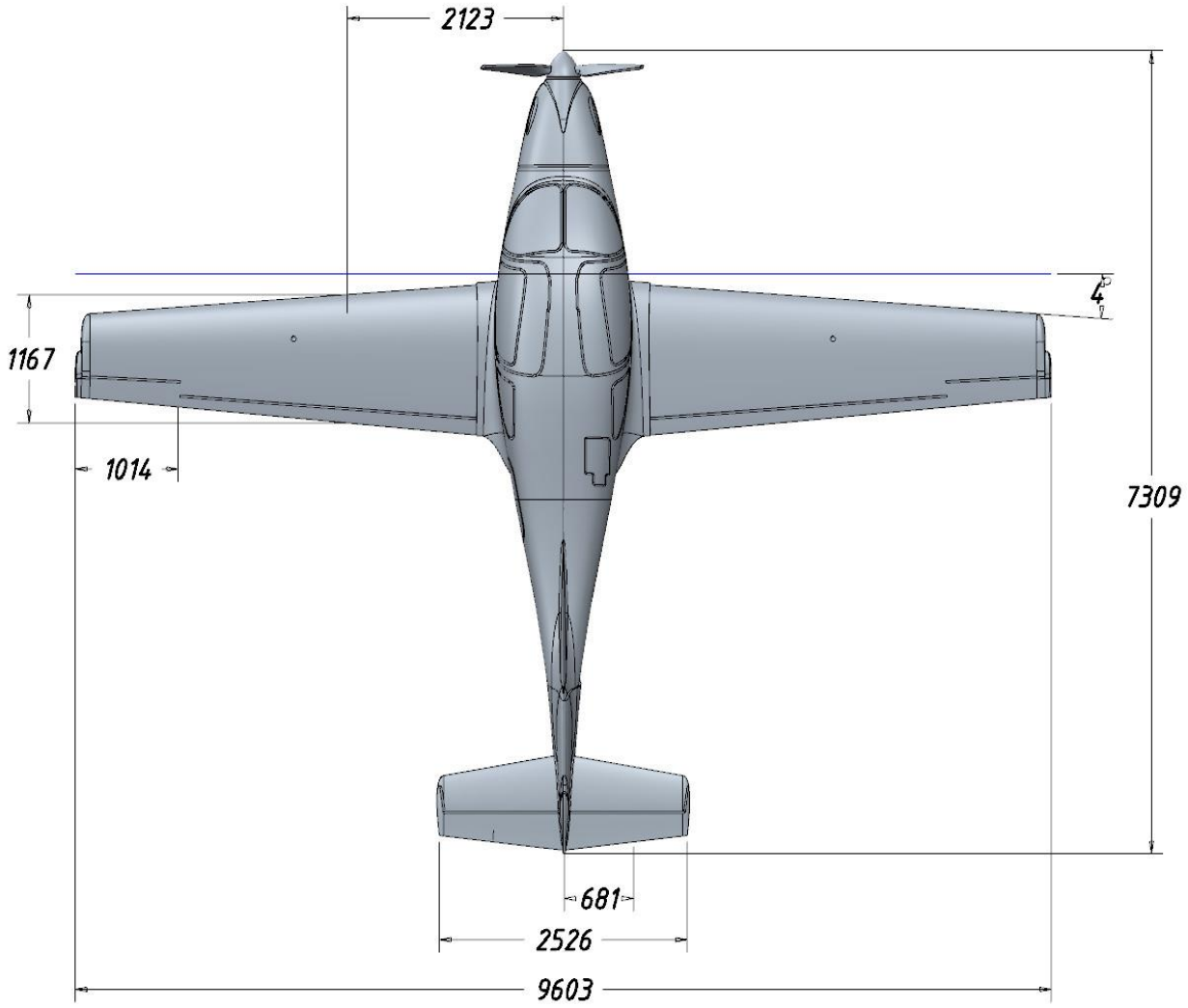
Normal category, non-aerobatic ANG-01 aircraft is intended to carry up to 5 occupants (including up to 2 pilots) in non-commercial recreational or itinerary flights, in the daytime, in uncomplicated weather conditions.

2.2 General Information

Aircraft type ANG-01 is of a normal aerodynamic design, cantilever low-wing monoplane with fuselage, deck-type empennage (*specific to a deck-landing aircraf*t), trapezoidal wing (*generally called tapered wing*).

General view and basic geometric dimensions of ANG-01 type aircraft:





Control surfaces: two-section elevator (with a trimtab on the right section), one-section ailerons, rudder (with a trimmer plate). All surfaces have an aerodynamic balancing horn.

High lift devices: two-section slotted flap.

Landing gear: retractable, tricycle, with a nose wheel steering.

Powerplant: a single reciprocating engine, a 3-blade tractor-type, in-flight adjustable variable pitch propeller.

2.3 Basic geometric dimensions

Geometric data (in addition to those specified in the figure of the part 2.2):

Component	Type of Data	Value
Wing	Area	11.2 m^2
	Aspect artio	8.5
	Wing taper	2.0
	Leading edge sweep	4.0 °
	Wing dihedral angle	5.0 °
	Mounting angle on the root rib	0.0 °
	Wing geometric twist	0.0 °
Empennage	Area	1.28 m^2
	Leading edge sweep	5.0 °
	Empennage dihedral angle	0.0 °
	Mounting angle on the root rib	5.5 °
	Empennage geometric twist	0.0 °
Fuselage	Door Size *	1.1x0.8 m
	Luggage compartment hatch size *	0.3x0.2 m
	Usable luggage compartment volume	1.00 m^3
	Fin mounting angle (from Aircraft plane of symmetry)	0.0 °
	Aircraft Propeller Clearance **	0.20 m
Landing gear**	Wheel track	1.94 m
	Wheel base	1.98 m

* - minimum length and width

** - for static compression of shock absorbers with maximum aircraft weight.

2.4 Airframe

The design of the airframe components is elaborated in the Maintenance Manual, and the FM provides only concise information.

2.4.1 Fuselage

The engine compartment is integrated in the fore part of the fuselage the pressurized cabin (pilots and passengers) and luggage compartment are accomodated in the central part, the empennage is located in the aft part.

The engine with attached accessories that are indispensable for its operation, are accommodated in the engine compartment, as well as pipelines and cabin air intake, cabin heating system, hydraulic unit, elements of the landing gear brakes. The front landing gear leg is accommodated in the bottom area of the compartment. The storage battery is accomodated in an isolated compartment. The engine is installed on a steel engine mount fitted with shock absorbing pads, which are mounted on the strong frame No. 1

There are two doors on the left and right sides, intended for entering and exiting the cabin, the doors open forwards and upwards, they are also emergency exits (with rip pins on the door hinges). The access to the luggage compartment is provided through the hatch behind the cabin.

The cabin is designed for five occupants with 1 or 2 side-to-side seated pilots, and 1 to 3 passengers seated on the sofa behind. The cabin is equipped with ventilation and air heating. There is a recess in the front area of the cabin for equipment, which is attached to the instrument panel. There is located, shifted to the right, a small luggage compartment ("glove compartment" for small items and documentation). The pilots' seats are arranged in the central area of the cabin. There is a central box (pedestal), located in the middle between the pilots. It accommodates the internal communication board, landing gear extension/retraction control board, and the pressure bottle with the tap for the landing gear emergency extension (in the armrest). The passenger sofa is accommodated in the aft area of the cabin, and the wing spar housing is located underneath. The sensors of the flight and navigation system and two fuel feed tanks with fittings are located behind the back of the sofa. The luggage compartment is located in the aft part of the central compartment; it is partially occupied by the parachute rescue system housing.

The vertical and horizontal empennage with control surfaces are accommodated in the tail compartment.

Vertical empennage is swept, of NACA 65-1-012 symmetrical profile, it is integral with fuselage and is made of fiberglass composite materials (to provide radio-wave transparency, since it accommodates a radio areal).

Horizontal empennage is swept, of NACA 6401 asymmetrical profile, it is a one-piece structure, glued into the fuselage, made of carbon-fiber composite materials.

2.4.2 Wing and high-lift devices

The wing of the aircraft is tapered in plan form, without a geometric twist.

Wing profile along the entire span is NLF (1)-215F, with a relative thickness of 16.5%, mean aerodynamic chord is 1.2 m (at a distance of 1.2 m from the in-board rib), with 0 °wing setting angle.

Design-wise the wing is composed of left and right wing panels, made entirely of carbohydrate composite materials, with the spars inherently incorporated therein. The wing panels accommodate the pull-rods and the aileron bellcranks of the control system, the high-lift device drive shaft, wiring harness (for navigation lights). The right wing panel also accommodates the elements of the Pitot tube: wiring harness (for heater controller and pneumatic line).

Integral fuel tanks are incorporated in the middle part of each wing panel. The fuel filler inlets of associated integral fuel tanks are located on the top part of the wing panels.

High-lift device of the wing rear edge consists of the Fowler flap (single-slotted, extendable), with a maximum extension of 16.5% and the angle of deflection of 30 ° respectively. Intermediate positions are 10 ° and 20 °.

The flap is extended and retracted by a servo actuator accommodated in the fuselage, by means of a respective part of the shaft, the extraction and retraction control is provided by means of a separate board on the central pedestal.

2.4.3 Control system

The aircraft control system is a traditional 3-channel one: pitch channel (elevator), roll channel (ailerons) and yaw channel (rudder).

The control system is mechanical, it consists of controls (aircraft control stick and left and right pilot pedals, which are mechanically interconnected), mechanical elements (pull-rods and bellcranks) and control surfaces.

All control surfaces are slotted, furnished with aerodynamic horn and weight balance of hinge moments. The elevator is two-sectional, while ailerons and rudder are single-sectional.

To reduce the force for deflecting the aircraft control stick an electric driven trimmer is provided on the right section of the elevator (controlled by means of the button on the aircraft control stick).

A trimtab is mounted on the rudder for providing directional (yaw) balance during a flight at cruising speed.

Autopilot servo drives are arranged in the pitch and roll channels of the control system.

2.5 Poweplant

2.5.1 Engine

Rotax 915 iS 3A engine, designed and manufactured by BRP-Rotax GmbH (Austria): is a reciprocal, gasoline powered, 4-stroke, 4-cylinder, engine with the opposite arrangement of cylinders.

Engine power (nameplate values, in ISA):

- ✓ Take-off power setting: 104 kW (141 HP) at 5800 rpm;
- ✓ Maximum continuous power: 99 kW (135 HP) at 5500 rpm.

The aircraft propeller is driven by means of a step-down gearbox. The fuel-air mixture is formed by means of an injector. In order to enhance the power, the engine is equipped with a turbocharger and intercooler.

The engine cooling system is of a combined type: the cylinder heads are liquid-cooled, the cylinders are air-cooled. The engine is equipped with an enclosed type oil system.

2.5.2 Aircraft propeller

The aircraft propeller has been designed and manufactured by S-PROP company (Ukraine). It is a three-blade, tractor-type, in-flight adjustable variable pitch propeller, with the diameter of 1820 mm.

The blades are made of composite materials, the front edge is protected against mechanical damage by a rubber lining. The blades are not heated.

The bushing is made of aluminum alloy. The propeller pitch control drive is electrically powered, it is arranged on the bushing (under the spinner). The pitch control signal is applied to the actuator from a separate board (located in the cabin, on the pedestal, by means of a sliding contact.

2.5.3 The means of control and monitoring

To enable the monitoring of the power plant the crew is furnished with the following current information:

- ✓ Engine speed;
- ✓ Temperature of cylinder heads (rear);
- ✓ Exhaust gas temperature;
- ✓ Coolant temperature;
- ✓ Oil temperature;
- ✓ Oil pressure;
- ✓ Air pressure in the receiver;
- ✓ Throttle position;
- ✓ Fuel consumption (calculated by throttle position);
- ✓ Fuel pressure in the pipeline;
- ✓ Residual fuel in tanks (total);
- ✓ Generator terminal voltage (phases A, B);
- ✓ Accumulated engine operating time.

To display this information, the ECU receives it from the engine and auxiliary sensors and transmits it through the CAN bus to the EMS for displaying it on the Dynon SkyView SV1100 multifunctional system displays.

The displays also provide warning information about the emergency condition of the power plant, the Dynon SkyView SV1100 generates appropriate sound alerts and transmits them to the aircraft intercommunication system.

Cabin control units:

- ✓ Throttle control lever;
- ✓ The variable pitch propeller control board.

Throttle control lever (for location see part 0) is mechanically connected with the throttle valve and the air filter choke by a system of cables and rods. The throttle control lever is mounted on the central pedestal between the pilots. All other engine control commands are executed by the ECU.

Variable pitch propeller control board (for location, see 0) operates both in manual and automatic modes and is changed over by a toggle switch on the control board. The pilot uses a setter (selector knob) in manual mode to select the required propeller speed, in automatic mode the speed is set and maintained by the ECU, depending on the throttle position. The control board is equipped with a screen, displaying the selected propeller speed.

2.5.4 Fuel system

The fuel in the aircraft is stored in two wing panel integral tanks and two feed tanks in the fuselage, altogether having a maximum total capacity of 260 liters.

Feed tanks are arranged in the bottom part between the passenger sofa and the luggage compartment of the central fuselage compartment, so that the fuel from the wing tanks flows into them by gravity.

There are 2 constant flow pumps, accommodated in the left feed tank, which also incorporate fuel level sensors (fuel gauge). They supply fuel to the fuel filter located in the engine compartment and further into the engine injector by the pressure line. The backflow of excess fuel from the injector into the feed tanks is performed by a draining line.

The draining system in the wing panel and feed tanks is arranged in centralized way, a U-shaped tube (intended to preclude the fuel leakage into the central compartment) is routed to the branch pipe under the fuselage. Additional drainage in the wing panel integral tanks is arranged through the filler necks.

2.6 Landing gear and hydraulic system

2.6.1 Landing gear

The landing gear is tricycle, three-wheeled, with two single-leg main gears and one single-leg nose gear.

All gears are retractable in flight: the nose gear is retracted aftwards flow-wise, the main ones are retracted under the fuselage normal to flow (towards the aircraft plane of symmetry). There are no outer gear doors.

All gears are equipped with shock absorbers of oleo-pneumatic type. The nose gear is of telescopic type, the main ones are of semilevered type.

Nose gear is equipped with a steering mechanism and is kinematically connected with the direction (yaw) control pedals (the angle of ± 30 ° at full pedal travel). All wheels are equipped with cast discs and tubeless tires.

2.6.2 Brakes

The main gears are equipped with hydraulically driven double-caliper disc brakes, anti-skid automatics is absent. The hydraulic brake drive is of road vehicle type: the brakes operate without engaging hydraulic unit, the fluid reservoirs are located in the engine compartment.

Braking is performed by depressing the brake pedals, which are arranged on the directional (yaw) control pedals of both the left and right pilots, i.e. each of them can apply the brakes independently.

2.6.3 The landing gear extension/retraction control

The position indication of each landing gear is performed by the associated green LEDs (in intermediate positions they are red) on the landing gear control board, which is located on the pedestal within reach of both pilots (for location, see 0).

The retracted or extended position of each gear is determined by the hydraulic lock incorporated into each cylinder.

When the toggle switch on the landing gear control panel is set either to extension or retraction, the electric driven hydraulic unit is engaged, the fluid pressure is applied to the cylinders on the associated side.

In the event of a the hydraulic unit failure or the absence of power supply, the landing gear extension is possible by means of the backup system only. For this purpose, set the three-way tap to the LG extension position. This opens the pressure nozzle of the carbon dioxide pressure bottle (in the cylinder above the tap), the pressure of this gas moves the slide valve, closing the pressure line of the hydraulic unit and pressing on the piston in the rod cavity of each cylinder.

2.6.4 Hydraulic system

The pressure source is the electrically driven hydraulic unit in a single assembly with a 2.5 liter reservoir and safety valves.

2.7 Electrical system

The generator No. 2, which is incorporated into the engine. The generator №1 is a power source for the engine solely (injector, ignition system, ECU, etc.).

The on-board 12 V (14 Ah) lithium-polymer storage battery is accommodated in an isolated compartment, in front of the frame No. 1. The compartment is equipped with terminals for connection with the aircraft circuit and the thermal sensor.

Power supply to the on-board circuit by the generator No. 2 is possible only after attaining the engine speed of 1800 rpm and disengagement of the starter.

In case of failure of the generator 1, the motor power supply is automatically switched to the generator No. 2. Thus, the generator will be disconnected from the on-board consumer circuit, supplying the power solely to the engine. At the same time, the associated indicator light is illuminated on the instrument panel.

The battery supplies power in flight in following cases:

- ✓ at engine start: to starter and ECU;
- ✓ in flight, in case when the generators fail: all consumers (15 min, in ISA).

2.8 Instrumentation

2.8.1 The primary flight and navigation equipment

The primary flight and navigation equipment is the Dynon SkyVieW SV1100 system. The Elements of this system are the following:

- ✓ Multifunction displays (2 pcs.);
- ✓ Pitot tube;
- ✓ Pitot heating controller;
- ✓ ADAHRS primary module;
- ✓ ADAHRS redundant (backup) module;
- ✓ Magnetometer (compass);
- ✓ Temperature sensor (3 pcs.);
- ✓ SNS module;
- ✓ Module for communication with engine EMS;
- ✓ Autopilot module;
- ✓ Autopilot control board;
- ✓ Autopilot servo drive (2 pcs.);
- ✓ Transpoder;
- ✓ Power storage battery.

All elements of the system are supplied with12V DC power by the on-board power circuit. In the event of a power failure, the system is equipped with an emergency battery that provides power for 30 minutes (in ISA).

Pitot tube is connected with ADAHRS modules by means of pneumatic tubes. The tube is equipped with an anti-icing heater.

The ADAHRS module is a source of indicated airspeed and vertical velocity data, barometric altitude, angle of attack, attitude angles, load factors, ambient (outside) air temperature. To enhance the reliability, the system incorporates two ADAHRS modules: the primary full-featured and the backup (redundant) one with limited functionality (operating as a "hot" redundancy).

The magnetometer (compass) is a source of magnetic heading data, it is also used by the system to calculate the angle of drift.

The SNS module is a source of data for ground speed, altitude above the Earth's surface, aircraft position on the map (in this version of the SNS module is used the GPS NAVSTAR only).

The EMS furnishes to the system the power plant data.

The autopilot module outputs command signals to the autopilot servo actuators via the control board to maintain the selected condition.

The transponder emits relevant aircraft identification data (current position, altitude, registration number, etc.).

Multifunctional color touch-screen displays (see part 0 for their location) are equipped with processors that compute all obtained current data and generate the images of scales and current flight information, navigation information, engine, autopilot, transponder information, as well as the aircraft position on map, flight route, temperature in the battery compartment.

The indicated air speed is adjusted for the instrumental correction to calibrated airspeed.

The display is equipped with a brightness adjustment knob and buttons.

All elements of the Dynon SkyVieW SV1100 system are protected against electromagnetic interference, mechanical stresses, vibration, humidity, water, barometric pressure and ambient temperature (exceeding the aircraft operational limitations).

2.8.2 Redundant flight instruments

In addition to the primary Dynon SkyVieW SV1100 system, the aircraft is equipped with the following redundant flight instruments (for location, see 0):

- ✓ Air speed indicator;
- ✓ Vertical velocity indicator;
- ✓ Pressure altitude indicator;
- ✓ Magnetic compass;
- ✓ Sideslip indicator.

The instruments are connected to the Pitot tube in parallel with the ADAHRS primary system sensors, the compass and the sideslip indicator operate autonomously.

The airspeed indicator has standard color-coded markings to indicate safe operation within the limitations of the aircraft. The green arc indicates the normal operating range of the aircraft, from V_{S1} to V_{NO}. The white arc indicates the flap operating range, V_{SO} to V_{FE}, used for approaches and landings. The yellow arc cautions that flight should be conducted in this range only in smooth air. The red radial line indicates the limit speed, which, if exceeded, may result in damage to the aircraft or its structural failure.

The airspeed indicator is supplemented with the instrumental corrections chart (located on the cockpit canopy).

2.8.3 Radio communication equipment

External radio communication is provided by the Dynon Skyview Com Radio SV-COM-25C short wave set. The antenna feeder of the radio set is emedded into the vertical empennage (which is radio-wave transparent, made of fiberglass). The radio control panel is located on the instrument panel (see part0).

The internal communication is provided by a 5 person intercom unit with headset plugs, including the SOFTCOMM PANEL MOUNT INTERCOM ATC-4PS device (see part 0).

Headsets are recommended those with noise cancellation. The use of any certified aviation headsets is allowed.

2.8.4 Lighting equipment

The aircraft is equipped with the aircraft navigation lights (BANO), flashing lights (strobes) and headlights.

There is no interior lighting for the cabin, luggage compartment and instrument backlighting (the aircraft is intended for VFR flights).

The aircraft navigation lights consist of the red light on the left/port wing tip and green light on the right/starboard wing tip, the white light is placed on the aft part of the fuselage.

The strobes are located on the tips of the right/starboard and left/port wing panels (together with aircraft navigation lights) and on the top part of the rudder (separately).

2.8.5 Instrument Warnings and Cautions

The instrument panel is equipped with warning lights (see part0):

- ✓ Engine ignition system loop A (HIC A) failure;
- ✓ Engine ignition system loop B (HIC B) failure;
- ✓ Engine generator failure (GENER);
- ✓ Pitot heating Failure.

Each light is equipped with placards, containing typical abbreviations that expressly explain their functional designation.

Green lights indicate satisfactory operation of respective systems. Red is the color for an unsatisfactory condition. The aircraft has an aural warning system working in conjunction with illuminated annunciator system The aural warning system alerts the pilot with audio signals through the intercom.

The visual and aural alerts are generated by the Dynon SkyVieW SV1100 system.

2.8.6 Instrumentation arrangement

General view of the instrument and central pedestal:

2.9 Utility-type and rescue equipment

2.9.1 Seats and safety harness, the cabin interior

The pilots have individual seats, separately lengthwise adjustable by means of the buttons on the central pedestal to ensure the suitablity and reachability of the controls (depending on their height).

The aircraft control systems (aircraft control stick and pedals), the instrument panel with the aeronautical equipment, toggle switches and automatic circuit breakers are accommodated in front of the pilots, within their reach in attached position. The power plant controls, landing gear controls and intercom system are located on the central pedestal, between the pilots.

Passengers of the aircraft are seated on a single triple sofa in the aft of the cabin, the individual seat adjustment is not provided for.

All pilots and passengers are secured in their seated position with individual adjustable 4-point safety belts. There is ensured reliable anchorage of belt fittings to the aircraft structure in case of emergency landing.

The cabin interior is made of non-flamable and easy washable materials.

The mesh holders for small items are arranged in the passenger area.

2.9.2 Ventilation and cabin heating

Ventilation of the cabin with the ambient air is provided through the baffles located on the left and right sides of the instrument panel.

A separate air intake is accommodated in the top cowling of the engine compartment, it supplies air to the baffles through the regulating valve.

The regulating valve is operated by a sliding handle on the central pedistal. The air distribution is controlled by moving the baffles.

The cabin is heated by extracting excess heat from the engine muffler, due to the special casing with a separate ambient air intake in the engine compartment bottom cowling. The casing is connected to the baffles via a regulating tap.

2.9.3 Luggage compartments

The aircraft is equipped with an isolated luggage compartment, a small “glove compartment” on the instrument panel, and a compartment in the armrest.

The luggage compartment is designed to accommodate the luggage of pilots and passengers: carry-on luggage, such as medium size bags or suitcases, other items. The maximum total mass is not more than 60 kg.

For securing luggage, there is provided a retention mesh, which is attached to special tie-down fittings on the reinforced floor of the compartment.

CAUTION Exceeding the maximum luggage mass or the absence of the luggage attachement may result in a critical change of the aircraft CG and, as a consequence, impairment of the aircraft controllability.

The "glove compartment" is intended for keeping operational documentation: FM, MM, Logbook of the aircraft and the engine, as well as small items and the documents of the crew.

The armrest compartment is used to access the landing gear emergency extention tap (see part 0), as well as for placing there FM (should be kept within easy reach of both pilots).

Access to the luggage compartment is possible solely on the ground, from the outside, through a separate hatch on the left side that opens against the air stream direction to prevent opening in flight.

Luggage compartment and small luggage compartment inside are uphostered with piled (fluffy), non-flammable and easily washable materials.

2.9.4 Rescue system

The aircraft is equipped with a rescue system that provides emergency landing of the aircraft with a maximum mass by means of a parachute, in the speed range of 120… 300 km/h (all data are within the operating limits of the ANG-01aircraft), at a minimum altitude of 300 m.

The system comprises a single container with a parachute enclosed and a parachute opening device, containing a powder charge. The rescue system is accommodated in the aircraft in a special casing in the aft area of the central compartment of the fuselage, on the right side (it occupies a part of the luggage compartment). The top of the casing is closed with a separate lid.

The slings of the rescue system are enclosed in a longitudinal and transversal grooves in the top part of the fuselage, under the protective straps. The ends of the slings are firmly attached to the parachute and the fuselage power elements.

The rescue system is activated by a handle (with a security peg), which is mechanically connected to the parachute opening device. The powder charge device pierces the casing lid in the fuselage and opens the parachute.

PART 3 OPERATING LIMITATIONS

CONTENT

Introduction

This part defines all the necessary operating limitations of the ANG-01 type aircraft, the observation thereof guarantees its safe operation.

Additional aircraft operating limitations, indispensible for its trouble-free operation and maintenance are listed in the ANG.01.KTE-MM.01 Aircraft Maintenance Manual.

CAUTION 1. The pilot must be aware of all these limitations.

2. Failure to comply with these limitations may result in damage to the airplane structure elements or creation of the conditions for severe aircaft accidents.

3.1 Weight and balance

3.1.1The minimum flight weight of the aircraft is 475 kg and is determined by the sum of:

- ✓ Empty Equipped Airplane Weight 385 kg (maximum);
- ✓ Weight of one pilot is 77 kg (according to CS-23);
- ✓ Fuel weight 13 kg (18.5 l) for 30 min. flight

3.1.2 The maximum flight weight of the aircraft 950 kg is determined by the sum of:

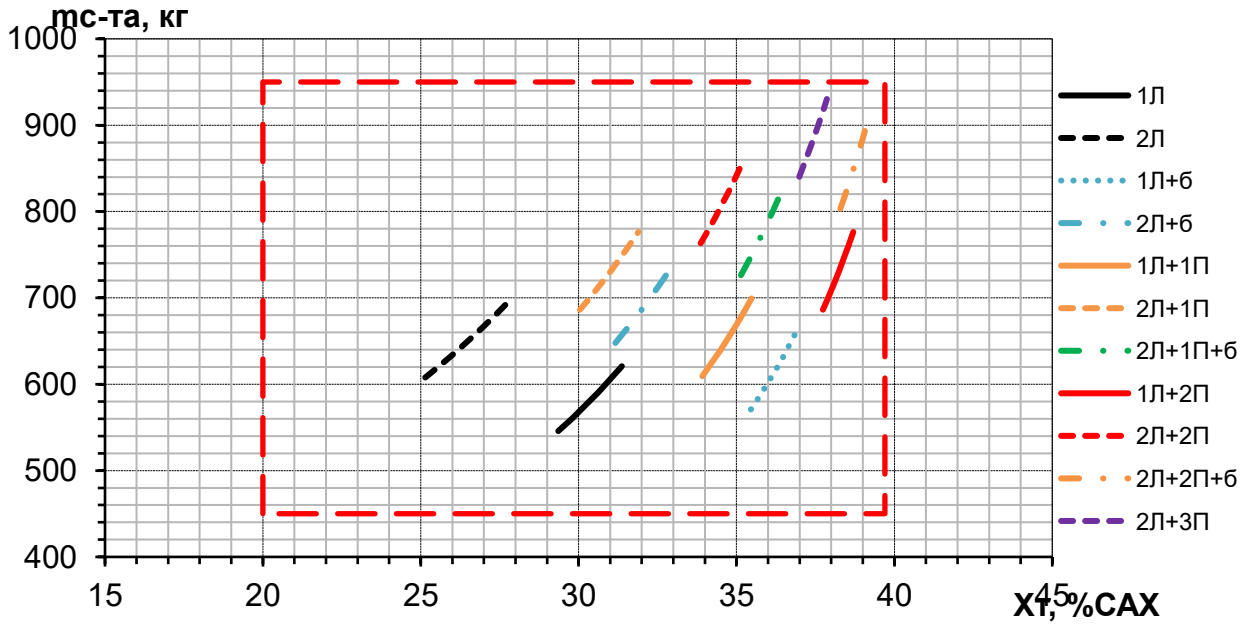
- ✓ Empty Equipped Airplane Weight 385 kg (maximum);
- ✓ Weight of 2 pilots 77 kg each (according to CS-23);
- ✓ Mass of 3 passengers 77 kg each (according to CS-23);
- ✓ Fuel weight 180 kg (260 l), which is the complete filling.

NOTE The mass of an empty, equipped aircraft is determined without crew, luggage, fuel (except for trapped unusable fuel) and ground equipment. The aircraft is filled with hydraulic fluid, lubricant and engine coolant.

Determination of the actual mass and the center-of-gravity position of the aircraft in a particular combination of the number and weight of persons on board, their luggage and the amount of fuel, should be performed according to the method described in the MM.

3.1.3 Centre-of-gravity range

Weight and balance chart with the area of limitations, all possible combinations of number of pilots, passengers, luggage, and depending on the consumption of fuel:



Мс-та, кг – Mass of the aircraft, kg

The designation "1Л" means an airplane with one pilot, "2Л" - with two pilots, "1Л + б" - with one pilot and luggage in the luggage compartment 60 kgf, "1Л + 1П" - with one pilot and one passenger, etc.

The center-of-gravity position changes insignificantly at the extent of fuel consumption, within the limits of 3% MAC, this change may be not taken into account in the calculations (the mass and center-of-gravity position are to be determined by the worst case, i.e. by the amount of fuel).

Forward center-of-gravity limit, of **25.0%** MAC is obtained with minimum amount of fuel in the combination of "2Л", aft center-of-gravity limit, **39.7**% MAX - in the combination of "2Л + 2П + б" or "1Л + 2П" with maximum amount of fuel.

CAUTION The combinations "1Л + 3П", "1Л + 3П + б", "2Л+3П+б" are forbidden, since they are beyond the operating envelope.

3.2 Number of crew members

Minimum crew: 1 pilot, maximum 2 pilots.

NOTE 1. The airplane equipment and its characteristics allow one pilot to operate the aircraft safely within operating limits, to perform the outside environment observation, as well as radio communications, and other operations according to the current FM.

2. The extent and duration of mental and physical efforts do not lead to extreme fatigue of one pilot in normal flight and in emergency situations.

Maximum number of passengers is 3 persons, subject to observance of the operating envelope as for mass and the aircraft center-of-gravity position.

3.3 Speeds

The speeds are determined in accordance with CS-23 Airworthiness Standards, with forward CG limit, without considering the propeller thrust, considering the instrument correction (all speeds are IAS).

CAUTION Flight operations at speeds below minimum or above maximum values are forbidden.

3.3.1 Stall speed (Vs) depending on airplane weight and flaps configuration:

Aircraft weight, kg	450	550	650	750	850	950
Flaps 0 °	70	75	80	85	90	95
Flaps 10 °	65	70	75	80	85	90
Flaps 20 °	60	65	70	75	80	85
Flaps 30 °	55	60	65	70	75	80

Thus, an increase of flight mass per each 100 kg results in a stall speed increase by 5 km/h.

3.3.2 Minimum flight speeds

Determined with speed margins normalized to the stall speed and depending on the weight of the aircraft are the following:

- ✓ 80… 110 km/h at takeoff with flaps at 10 ° or 20 ° (V_2);
- ✓ 85… 115 km/h at landing with flaps 20 ° or 30 ° ($_{VREF}$);
- ✓ 100… 125 km/h at climb, descent, horizontal flight.

NOTE for determining the minimum speeds for a specific mass of the aircraft use the nomograms, PART 7.

3.3.3 Maximum flight speeds

Determined with speed margins normalized to maximum speeds depending on the aircraft configuration (flap and landing gear position) are the following:

Speed	Value	Configuration	Note
V_D	340 km/h		ultimate as for strength and flutter
V_{NO}	320 km/h	Flaps 0 °, LG retracted	not allowed to exceed
V_A	200 km/h		Maneuvering speed without limitation of loads factors
V_{FE}	130 km/h	Flaps 10,10,30 °	when extending/retracting flaps *
V_{LE}	130 km/h	LG extended	when extending/retracting LG *

* - also when flying with flaps and landing gear extended

3.4 Flight altitude

The maximum flight altitude is 3500 m, it is limited due to the absence of oxygen equipment in the aircraft (cabin is not pressurized).

3.5 Load factor

Vertical load factor is limited to -0.5… 3.0 g

3.6 Maneuvering

Allowed aerobatic maneuvers:

- ✓ all maneuvers inherent to a normal flight, incl. turns, spirals, banking manoeuvre, slippings, diving, steep climbs;
- ✓ Lazy “eight", intensive banked turns with a bank not exceeding 60 °;
- ✓ Stalls.

WARNING Stall is allowed for training purposes only.

3.6.2 Maximum allowed roll angle is 60 ° left and right. Roll of up to 90° is allowed in coordinated turns.

CAUTION Advanced aerobatics and inverted flight are FORBIDDEN.

3.7 Types of flights

It is allowed to carry out daytime flights, according to the visual flight rules (VFR).

CAUTION Flights in forecast icing conditions, in areas of lightning, in the proximity to significant cumulus clouds, over large bodies of water at a distance from the shoreline that exceeds the gliding range with engine failure is FORBIDDEN.

3.8 Meteorological conditions

Visibility range of at least 1000 m.

The altitude of the lower edge of cloud at least 150 meters.

The air temperature at ground in the range of -15 ... + 35 ° C.

The airfield altutude above sea level in the range of 0… 500 m.

Maximum wind speed at ground:

- ✓ Head component to 10 m/s;
- ✓ Tail component up to 5 m/s;
- ✓ Cross component up to 8 m/s (from the left, from the right).

3.9 Aerodromes

3.9.1 The operations are authorized at class A, B, C, D, E, F aerodromes, unclassified and miscellaneous aerodromes, permanent and temporary landing sites.

3.9.2 Minimum equipment for aerodromes and sites should be communication and visual observation means, availability of meteorological information (pressure, temperature, direction and velocity of wind at ground).

3.9.3 Runway size: 700x10 m in all expected operating conditions. The size of the runway, depending on the mass of the aircraft, wind speed and ambient temperature, makes 180 ... 480 m - for take off; 300 ... 650 m for aborted take-off; 520 ... 700 m – for landing (runway slope of 2% to any of its edges).

NOTE for determining the requisite size of the runway for a specific actual mass of the aircraft and environment, use the nomograms, PART 7.

3.9.4 Runway types and conditions:

- ✓ dry artificial hard surface runway (DRY condition);
- ✓ humid or wet artificial hard surface runway (GOOD condition);
- ✓ dry dirt runway with a strength at least 8 kgf/cm2 and herbage up to 5 cm.

WARNING 1. A dirt runway shall have a prepared surface without pits and bumps, with irregularities not exceeding 5 cm on the basis of 3 m.

2. Landing on an unproved landing area is allowed only in the emergency situation**.**

3.10 Power plant

Basic operating limitations defined by BRP-Rotax:

Limitation	Value	Note
Shaft speed	1800 rpm	Idle condition
	5500 rpm	Maximum continuous operation
	5800 rpm	Take-off condition, up to 5 minutes
Oil consumption	0.06 l/h	maximum
Oil pressure	0.8 bar	minimum, <3500 rpm
	2.0 bar	minimum,> 3500 rpm
	5.0 bar	maximum
Fuel pressure	2.9 bar	minimum operating
	3.1 bar	max operating
Oil temperature *	50 ° C	minimum
	130 ° C	max operating
Coolant temperature *	40 ° C	minimum
	120 ° C	maximum
Exhaust gas temperature	200 ° C	minimum
	950 ° C	maximum

* - in flight

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PART4 STANDARD PROCEDURES

CONTENT

Introduction

This part defines all the ANG-01 type aircraft procedures required to conduct safe flights with normal operation of its systems.

Aircraft maintenance procedures, which are not directly related to the flight operation (refueling, mooring, etc) are described in the ANG.01.KTE-MM.01 Aircraft Maintenance Manual.

CAUTION Failure to follow these procedures may result in damage to the aircraft structure, or cause severe aircraft accidents.

4.1 Pre-flight inspection

4.1.1 Walk-around (*out-side*) inspection, Checklist №1

Item.	Subject of inspection	Pay attention to
1	Propeller	Check for the absence of play, cracking and chipping of the blades, rubber peeling on the edge.
	Engine cowling	Check for the absence of fuel or oil leakage, damage to the paint coating, the cowling retainers should be locked, the plugs removed, the battery should be properly installed.
	Front LG	Check for the absence of play, traces of oil leakage, shock strut cylinder should be clean, wheel disc without cracks, tire should be inflated, there should be no cuts and tire cord chafing, LG well shold be clean.
	Windshield	No cracks, "silvering", turbidness.
2	Right wing panel	Check for the absence of play, damage to paint coating, front edge should be clean, the headlight, navigation lights fairings should be properly attached, their glazing without cracks, no play of Pitot tube, the plug should removed.
	Right fuel tank filler neck	Check for the absence of leaks, cap should be locked, drainage should not be soiled.
3	Right aileron	Check for the absence of play, damage to paint coating
	Right flap	Check for the absence of play, damage to paint coating
	Right LG	Check for the absence of play, traces of oil leakage, shock strut cylinder should be clean, wheel disc should have no cracks, tire should be inflated, there should no cuts and tire cord chafing, turn marks should match, brake hoses should be attached, LG well should be clean, footstep should be unfolded.
4	Fuselage aft part (right side)	Check for the absence of damage to paint coating, cracks, peeling and chipping of the surface, placards and reg. number should available, the surface should be clean, the control system hatch should be secured.
5	Stabilizer	Check for the absence of damage to paint coating, cracks, peeling and chipping Check for the absence of cracks in the area of attachment to the fuselage, the surface should clean.
	Elevator	Check for the absence of play of the left and right sections and trimtab, the sections should synchronously deflect without any significant force, the trimtab should be connected with its drive .
	Rudder	The play should not exceed 1 cm, the trimmer plate should be adjusted.
6	Fuselage aft (left side)	Check for the absence of damage to paint coating, cracks, peeling and chipping of the skin, placards and reg. number should be available, the surface should be clean, the control system hatch should be secured.
7	Luggage compartment	Check for the absence of fuel odor, luggage should secured, hatch closed.
8	Left aileron	Check for the absence of play, damage to the paint coating
	Left flap	Check for the absence of play, damage to the paint coating
		Check for the absence of play, traces of oil leakage, shock strut cylinder should be clean, wheel disc without cracks, tire should be inflated, there should be no cuts and tire cord chafing, turn marks should match, brake hoses should be attached, LG well should be clean, footstep should be unfolded, at least one wheel should be chocked.
9	Left wing panel	Check for the absence of play, damage to the paint coating, the front edge should be clean, the headlight, navigation light fairings should be properly attached, their glazing have no cracks.
	Left fuel tank filler neck	Check for the absence of leaks, cap should be locked, drainage should not be soiled.

4.1.2 Cockpit safety Inspection, Checklist №2:

Item.	Subject of inspection	Pay attention to
1	General examination	Pilot should occupy the right seat. Make sure that the seats, the floor, the instr. panel hood and the rear shelf behind the passenger aisle are free from foreign objects, there are no sagging wires under the the insr. panel, no odor of fuel and burned wiring. Check for the availability of seat belts for the entire crew and their proper anchorage. Check for the availability of the fire extinguisher and the first aid kit at their regular location. Make sure that all instrumentation is installed and properly secured. Make sure that the doors can be securely retained in their open position, emergency pins are installed.
2	Documentation	Make sure that the FM is available and remains at its prescribed place. The relevent flight documentation is placed in the “glove compartment”, if needed (availability of MM, Aircraft and Engine Log Books is optional for flight).
3	Power supply, control boards	Make sure that all the toggle switches are off and all automatic circuit breakers are on. Turn on the MASTER SWICH and AVIONIC toggle switches. Make sure that the variable pitch propeller control board is switched on as prescribed: its annunciator backlights 5800 rpm. Make sure of proper function of the flap control board: the LEDs are green, without flickering, the actual flap position complies with the indication. Make sure of proper function of the LG control board (the extended position LEDs are lit green, without flickering, the retracted and intermediate position LEDs are not lit). Make sure of proper function of the on-board radio set.
4	Instrumentation equipment	Check for proper function of the Dynon SkyVieW SV1100. Check for the system’s recognition of all sensors (listed in 0) and the accuracy of system readings. Check for proper on-board power supply voltage 12 ± 0.5 V. Check for the compliance of geolocation with the actual location of the aircraft. Check for the proper operation of warning lights (red before the start of engine). Set to "0" the backup altimeter and speed indicating instrument: the barometric (atmospheric) pressure must correspond to the actual aerodrome meteorological data. Enter into the system the air route (if necessary).
5	Controls	Check for proper operation of the aircraft control system by moving the aircraft control stick in the longitudinal (pitch) and transversal (roll) channels to its limit positions: when pulling the control stick it should deflect the elevator upwards and vice versa; when moving the control stick leftwards it should deflect the left aileron upwards, the right one - downwards and vice versa. The control stick movement should be smooth, free from sudden jerks, synchronous with left and right control positions. Check for proper operation of the elevator trimtab: its position should comply with the prescribed one. Check for proper operation of the throttle control lever: its travel to its limit positions must be smooth.
6	Crew seating	Crew members should take up their positions according to the weight and balance calculation. Everybody should attach and adjust their seat belts. The pilots should adjust their seats, to ensure reachability of the control stick and pedals.
7	Radio communication	The crew should plug their headsets into the intercom unit. Everybody should check for the availability and quality of the internal communication. The pilots should set the radio center frequency (if available at the airfield). The pilots should check for the availability and quality of external communication.

CAUTION 1. If at least one checking according to the Checklists №1 and № 2 has not been conducted, or the result of the checking does not meet the Checklist requirement, the flight should not be performed unless the irregularities are rectified.

2. Flying without effective and entire execution of existing Checklists may result in a severe aircraft accident.

4.2 Starting and shutting down the engine

4.2.1 Perform a triple cranking of the engine shaft by the blades (to enable the lubrication of engine elements after parking for more than 1 hour).

4.2.2 Check the compliance of the actual fuel amount with the data of Dynon SkyVieW SV1100.

NOTE A difference of up to 5 liters is allowed.

4.2.3 Set 2900 rpm on the variable pitch propeller control board.

4.2.4 Set the engine control lever in the "Idle" position (pulling the lever back completely).

4.2.5 Request the ground service a clearance to start (if available at aerodrome/landing site).

4.2.6 Make sure that the humans, animals or obstacles in the plane of the propeller rotation and at least 5 m away ahead of the aircraft are absent.

4.2.7 Compress the wheel brakes up to stop.

4.2.8 Switch on the "FUEL PUMP" switch of the feed tank (main, backup) pump. Make sure that the fuel pressure is not less than 0.3 bar.

4.2.9 Give a caution to stay clear of propeller, press and hold the "START" button in ONE MOTION until the engine starts reliably, and then release the button.

WARNING If the engine does not start within 10 seconds, discontinue the process. Restart in 2 minutes at least.
Multiple attempts to start the engine, operating the tank pump without fuel consumption by the engine may result in engine overflowing and spilling the fuel through the exhaust system, making a fuel puddle under the aircraft. In this case, the aircraft must be moved at least 2 m away in order to preclude its inflamation.

4.2.10 Make sure that the loop indicator lights are illuminated green (both ignition circuits operating normally).

4.2.11 Increase the engine power setting to 2900 RPM by moving the engine control lever forward. Perform warming up for at least 1 minute.

4.2.12 Check the oil temperature while heating: up to 70 °C.

4.2.13 Make sure that the power supply by generator is engaged (the indicator light should be green).

4.2. 14 Assess the engine response by setting 5500 rpm on the adjustable pitch propeller control board and smoothly pushing the engine control lever up to 50%, then pulling it back. Repeat at a higher rate if necessary.

ATTENTION With the position of the engine control lever at 50% the skidding of the aircraft is possible both on a dirt runway and a precipitation affected artificial hard surface runway. With the position of the engine control lever above 70%, the skidding of the aircraft or wheel spin are possible even on a dry artificial hard surface runway. It is required to ensure the parking of the aircraft with chocked wheels and the absence of any obstacles 20 m ahead of the aircraft.

4.2.15 Shutting down the engine on ground

Turn off the engine at the discretion of the pilot by pressing the START button and switching off the FUEL PUMP toggle switch.

4.2. 16 Emergency engine shutdown on the ground

. Perform immediately according to 0 in cases of:

- ✓ engine fire;
- ✓ significant vibration of the engine and aircraft;
- ✓ danger to humans or animals;
- ✓ danger of collision with obstacles;
- ✓ the ordor of fuel or burned wiring in the cab;
- ✓ malfunction of the variable pitch propeller control;
- ✓ fuel pressure drop;
- ✓ oil or cylinder head temperature is beyond operating limits;
- ✓ inability to switch to the power supply by engine generator.
- ✓ other extrinsic causes at the discretion of the pilot.

4.3 Taxiing

4.3.1 Request the ground service a clearance to taxi (if available at aerodrome/landing site).

4.3.2 Make sure of the absence of humans, animals or obstacles in the direction of movement within 20 meters at least.

4.3.3 Start the aircraft movement by slowly releasing the brakes and increasing the engine speed, pushing the engine control lever forward. The recommended taxiing speed is **of about 5… 10** km/h (corresponds to an average speed of a pedestrian).

4.3.4 Turns should be executed by proportional and smooth pressing on the appropriate rudder pedal and, needed be, by asymmetric braking.

NOTE

1. For effective control of the nose gear, advance the aircraft control stick for a half a travel.
2. In case of crosswind exceeding 5 m/s, displace the aircraft control stick towards the wind.
3. Take into account the side obstacles, assuming the wing panel turn of about 10 m.

WARNING

Do not execute the flight, if the engine power setting exceeding 50% is needed for taxiing on the dirt runway or on precipitation affected artificial hard surface runway (surface resistance during take-off acceleration will critically increase the running length).

4.3.5 Set the flaps to the needed position (10° or 20°).

4.3.6 Make sure that no aircraft is approaching or is present on the runway and there are no other obstacles on the runway.

4.3.7 Request the ground service a clearance to enter the runway (if the former is available at the aerodrome/site).

4.3.8 Place the aircraft on runway with its nose directed according to the chosen take-off heading, set the engine to "Idle", compress the brakes.

4.3.9 Check the runway magnetic course (if known) with that determined by the Dynon SkyVieW SV1100 system and the backup compass.

4.4 Take-off

There are no specifics, no atypical flying technique is required, a below-average pilot skill is sufficient.

When taking-off in the conditions of headwind or crosswind above 5 m/s apply 10 ° flaps, 20°flaps are recommended in other cases.

Calculate flight mass, characteristic speeds, requisite distances for normal and aborted takeoff according to the part 7.2 nomograms

4.4.1 Check the selected flap position.

4.4.2 Request the ground service a take-off clearance (if available at aerodrome/landing site).

4.4.3 Start the flight timer.

4.4.4 Release the brakes and at the same time, smoothly advance the engine control lever all the way froward (take-off power setting).

NOTE it is recommended to set take-off power 2… 3 seconds in advance on a dry artificial hard surface runway and 3… 5 seconds in advance on a dirt runway or precipitation affected artificial hard surface runway.

4.4.5 Check the engine speed during the take-off acceleration (as the speed increases from 5200 to 5500 rpm) till reaching a typical rotation speed of **75… 90** km/h (V_R for the mass of the aircraft respectively 550… 950 kg).

4.4.6 Creat a take-off pitch angle of 3… 5° by a smooth pulling of the aircraft control stick and maintaining it until the aircraft unsticks from the runway.

4.4.7 Initial climb should be performed with the acceleration to a typical safe take-off speed of at least **85… 110** km / h (V_2 for the mass of the aircraft respectively of about 550… 950 kgf) with factually no climb and then climb without changing this speed.

4.4.8 Retract the landing gear at an altitude of about 5… 10 m by switching the toggle switch on the LG control board (the process takes about 15… 20 seconds). It is allowed to fly up to 20 minutes without retracting the landing gear.

4.4.9 Retract the flaps at an altitude of about 50… 70 m, controlling this process by means of the flap control board.

NOTE Counteract the disturbances caused by crosswind, deflecting the rudder by means of pedals and displacing the aircraft control stick in roll. As a rule, in case of a crosswind exceeding 5 m/s, just after unsticking of the aircraft from the runway, there occurs a drift away from the runway center line, resulting in a lateral deviation of the aircraft within the width of the runway.

4.5 Climb

4.5.1 Set by means of the variable pitch propeller control panel 5200 rpm and 80% of the engine control lever (maximum continuous power setting) at an altitude at least 100 m.

4.5.2 Perform the desired climb at a speed of about **140… 150** km/h (which ensures a maximum vertical velocity). If necessary, execute the turns without sliding with more than ½ the diameter of the "ball", with a roll up to 20°. Relieve the control stick force by means of the trimtab.

NOTE 1. The rate of climb will be 5, 4, 3 m/s **(**in ISA, for 550, 750, 950 kg aircraft weight, respectively).

2. Characteristics of climb (time, fuel consumption, distance) depending on the mass of the aircraft and the specified altitude are provided in the nomogram, part 7.4.

WARNING in exceptional cases, at the discretion of the pilot, it is allowed to execute the climb with the take-off engine power setting (5500 rpm, engine control lever at 100%) for up to 5 minutes. Hereby the rate of climb increases by 2 m/s. It is necessary to check the temperature of oil and CHT, to preclude the exceeding the operating limitations.

CAUTION Do not decrease the speed below 130 km/h ($1.3V_S$), due to the danger of stall.

4.6 Level flight

It is performed mainly when flying en-route, with 0° flaps and retracted landing gear, within the range of engine power setting from cruising to maximum continuous, which, under all other equal conditions, will provide:

- ✓ Flight for a maximum duration at a speed of 230 km/h and engine power setting below cruising (4200 rpm, engine control level at 60%);
- ✓ Flight at a maximum distance, at a speed of 280 km/h and engine power setting for cruising flight (4800 rpm, engine control level at 80%);
- ✓ Flight for a minimum time, i.e. at a maximum speed (depending on the mass of the aircraft) of about 300… 320 km/h and at maximum continuous power setting (5200 rpm, engine control level at 100%).

En-route turns should be executed without slipping, exceeding one “ball” diameter, with a roll up to 45 °.

Relieve the control stick force by means of the trimtab.

CAUTION 1. Avoid decreasing the speed below 140 km/h (1.4V_S), due to the danger of stall.

2. Consider that flying with the extended landing gear reduces the range of flight by 15%.

Climbs and descents, if a variable altitude flight profile is envisaged, execute according to the PART7 respectively.

Calculation of distance, depending on the amount of fuel, aircraft mass, wind speed is provided in the nomogram, part 0.

4.7 Aerobatics

4.7.1 Aerobatic maneuvers allowed:

- ✓ Turns
- ✓ Spirals
- ✓ Bank modulation manoeuvres
- ✓ Slippings
- ✓ Diving
- ✓ Steep climbs
- ✓ Lazy “eight"
- ✓ Intensive banked turns
- ✓ Stalls
- ✓

WARNING Stall is allowed for training purposes only, at an altitude at least 500 m.

4.7.2 The minimum speed for aerobatics is **150** km/h.

4.7.3 Aircaft behavior at stall

Stalling is safe, it is possible in case gross piloting errors, it occurs when pulling the aircraft control stick all the way back on pitch and may be exhibited in an unintended aircraft nose-down without roll and yaw, with acceleration, even if the pilot does not execute any action. To prevent from entering the spin it is only necessary to avoid making sharp movements of the aircraft control stick and the rudder pedals.

WARNING 1. Stalling may be perceived by an appreciable trembling at a speed margin of 10 km/h prior to its occurance.
2. For recovering it is necessary to push the aircraft control stick to neutral, keeping neutral on roll and pedals and without changing the engine power setting.
3. With acceleration to 100 km/h, set the aircraft control stick on pitch and the engine power for maintaining level flight.

NOTE 1. It is possible to control the roll and the yawing by direct application of the aircraft control stick and the pedals prior to the beginning of the stall.
2. The loss of altitude during the stall is maximum of 150 m.
3. During the recovery from stall, the possibility to prevent roll or yaw at angles above 15 ° is ensured by usual application of the aircraft control stick and pedals.

4.8 Descent

It is allowed to execute the descent at any speed and roll and in any operational range.

Set the RPM selector to 5500.

The straight-in let-down is usually executed at the speed of earlier level flight.

The descent in the zone is usually performed by the method of descending spiral at a speed of 140… 150 km/h with a roll up to 30° and a vertical velocity of -2 ... -5 m/s.

Maximum gliding speed is 180 km/h.

Characteristics of descent (time, fuel consumption, distance) depending on the mass of the aircraft, wind and assigned altitude are provided in the nomogram, part 0.

WARNING Do not exceed the propeller speed of 5800 rpm. Check the temperature of oil and CHT, to preclude the cooling below operating limits.

CAUTION Do not exceed the speed of 320 km/h (V_{NO}), since it may result in the rudder flutter (V_D = 340 km/h).

4.9 Landing

There are no specifics, no atypical flying technique is required, a below-average pilot skill is sufficient.

Apply 20° flaps when landing with headwind and crosswind above 5 m/s, otherwise 30° flaps are recommended.

Calculate flight mass, characteristic speeds, requisite landing distance, using the nomograms, part 0.

CAUTION If the calculated landing distance exceeds the actual length of the runway, it is FORBIDDEN to land at this aerodrome (landing site).

4.9.1 Request the ground service a landing clearance (if available at the aerodrome/site).

4.9.2 Establish a visual reference to the runway make sure of the absence of obstacles on the runway as well as in the approach area.

4.9.3 Set the variable pitch propeller to 5500 rpm (to enable a quick build up of maximum thrust in case of balked landing)

4.9.4 If the flight was executed with retracted landing gear, perform a regular landing gear extension before entering the turning base or at a distance to the runway of about 1.5… 2 km and an altitude of 120… 150 m, at a speed up to **130** km /h (taking about 5… 10 seconds). In any case, make sure that all the landing gears are extended.

CAUTION Monitor the green LEDs annunciator to check for the extended condition of ALL landing gear struts. The absence of green light warns that the landing gear has not been extended or it has not been locked in extended position. In this case, discontinue the approach and executed the operations as per the part 2.

4.9.5 Extend flaps to the selected landing position before entering the base-leg a speed not exceeding **130** km/h. Check for the green LED light illumination on the control board, indicating respective flap configuration, if necessary, double-check visually that the flaps are extended. In case of flap extension failure, execute approach and landing with 0° flaps according to the recommendations of the part 4.

NOTE When extending flaps the retrimming is practically unappreciable on the aircraft control stick, the trimmer is automatically adjusted.

4.9.6 Take landing heading at an altitude of 100… 120 m (in case of straight-in approach), set and maintain an approach speed of about **100… 115** km / h (V_{REF} for mass 550… 950 kg respectively) and vertical velocity V_Y = -3… -5 m / s (corresponds to a shallow and normal glide path). If

necessary, at the discretion of the pilot, it is allowed to approach at a vertical velocity of 6… 8 m / s (steep glide path).

4.9.7 Perform leveling at an altitude of 3 ± 1 m (for a shallow glide path), 6 ± 1 m (for normal glide path) or 9 ± 1 m (for steep glide). Perform it by a smooth pulling of the aircraft control stick, making a landing pitch angle of 3… 5°. At the same time, pull the engine control lever back to "Idle" (to its maximum rear position). As a result, reduce the speed by 5… 10 km / h and V_Y to -1… -1.5 m / s.

CAUTION 1. In case of zero or negative pitch angle there is possible a repeated unsticking from runway at touch-down. In this case, do not change the position of the engine control lever, operate the aircraft control stick smoothly, ensuring further landing.

2. In case of a large positive pitch angle at touch-down (more than 10°), the runway may be touched with the ventral strake, which may result in damaging the aircraft.

4.9.8 Maintain an altitude of 1… 1.5 m, reducing V_Y by operating the aircraft control stick up till touch-down without changing the engine power setting.

4.9.9 Immediately after touch-down “lower” and “press” the nose gear down by a smooth forward movement of the control stick (for reliable heading control at low speeds, where the rudder is ineffective).

[*“Lower” in this case means to advance smoothly the aircraft control stick till the nose wheel reliably touches the runway surface, “press down” means to move the control stick maximally forward to enable reliable steering of the nose wheel*]

4.9.10 Perform wheel braking with an intensity accounting for the condition and length of the runway. Counteract side drifts by asymmetric braking.

NOTE Execute impulsive braking either on a dirt surface runway or precipitation affected artificial hard surface runway, pressing and releasing the brake pedals with a interval of approximately 1 second, for more effective deceleration.

WARNING Counteract the disturbances caused by crosswind by a coordinated deflection of the rudder and ailerons (make a drift, crabbing the aircraft [pointing the nose of the aircraft partly into the wind], "protecting yourself" with a roll of an opposite sign).

Just before the touch-down eliminate the drift by a deflection of the rudder, align the aircraft on runway heading, having eliminated the roll.

In case of a strong crosswind (more than 5 m/s), when eliminating the drift earlier, there will occur a significant slip.

4.10 Go-around (balked landing)

There are no specifics, no atypical flying technique is required, a below-average pilot skill is sufficient.

Allowed at any altitude.

4.10.1 Report about go-round (if the ground service is available at the airfield/landing site).

4.10. As soon as the decision is made, set the engine to take-off power smoothly pushing the engine control lever all the way out, check the engine speed (it should be 5500 rpm).

4.10.3 Simultaneously enter into climb, making a pitch of 3… 5 ° smoothly pulling the aircraft control stick and maintaining a speed, which is above the approach speed (V_{REF}).

NOTE 1. Altitude loss is about 3… 6 m.

2. The distance from the beginning of go-around to the altitude of 50 m is about 250… 300 m.

4.10.4 Execute a normal landing gear retraction at a stable climb (V_Y not less then 3… 5 m/s).

4.10. 5 Execute a normal retraction of the flaps at an altutude of 30… 50 m.

WARNING As a rule, in case of a crosswind exceeding 5 m/s, there occurs a drift, which results in a lateral deviation of aircraft within the width of the runway.

4.10.6 Execute a circling flight or a flight to other airfield (at the pilot's discretion, depending on the situation).

4.11 After flight procedure

4.11.1 Report about quitting the runway (if the ground service is available at the aerodrome/site).

4.11.2 Execute taxiing, using the methods, described in the part 0.

4.11.3 Bring the aircraft to full a stop at the parking ground, having compressed the brakes. If necessary, report the ground service about the end of flight.

4.11.4 Shut down the engine and all aircraft systems (all toggle switches, the last is MASTER SWICH).

4.11.5 All crew members should take off their headsets, detach their belts and quit the aircraft.

The page is reserved

PART 5. EMERGENCY PROCEDURE

CONTENT

Introduction

This part defines all the procedures for ANG-01 type aircraft required for a safe completion of a flight in emergency condiitons, critical failures of the aircraft systems or a fire on-board the aircraft.

CAUTION 1. In case of an emergency, it is imperative to unswervingly follow the procedures of the current part in the same sequence and to remember them word-to-word.

2. In case of any emergency situation, the primary task of the pilot is to maintain control of the aircraft and to fly safely to landing.

3. Failure to follow these procedures may result in a severe aircraft accident.

5.1 Use of rescue system

In case of fire, failure of the engine, occurrence of a spin, if the flight altitude is more than 300 m, use the rescue system, for this purpose:

5.1.1Turn off the engine.

5.1.2 Disable the FUEL PUMP toggle switch.

5.1.3 Disable the MASTER SWICH toggle switch.

5.1.4 Tighten seat belts and protect your body (cover face and keep limbs close). (all persons on-board).

5.1.5 Remove the safety peg and activate the rescue system, for this purpose jerk the activating handle hard at least 10 cm out.

NOTE The use of the system is permitted over the entire speed and mass range, but at an altitude at least 300 m. The system is mechanical, fully autonomous and does not require any power source.

5.1.6 Unlock emergency exit and jettison the door (-s) (in flight).

NOTE The emergency exit unlocking consists in removing the detent and door pins on the required side, or on both sides if the number of occupants is more than 1.

5.1.7 Send a distress signal at the frequency of 121.5 MHz.

5.1.8 Egress the aircraft after landing.

CAUTION 1. The rescue system parachute provides a landing with a vertical of up to 7 m/s.

2. In case of wind, the horizontal speed is up to 5 m/s.

3. All this may result in partial deterioration of the aircraft structure and injuring the crew and passengers, but with the guarantee of life saving.

5.2 Engine failure on the ground

Discontinue the takeoff, for this purpose:

5.2.1 Fully depress the landing gear brakes.

5.2.2 Disable the FUEL PUMP toggle switch.

5.2.3 Disable the MASTER SWICH toggle switch.

5.2.4 After stopping, unlock the emergency exit, detach the door and egress the aircraft.

5.3 Engine failure at low altitude

If the engine fails at an altitude below 100 m, land “just in front”, for this purpose:

5.3.1 Set the speed to about **100… 110** km/h.

5.3.2 Disable the FUEL PUMP toggle switch.

5.3.3 Disable the MASTER SWICH toggle switch.

5.3.4 Unlock emergency exit.

5.3.5 Send a distress signal at the frequency of 121.5 MHz, if possible.

5.3.6 After stopping, open the door and egress the aircraft.

CAUTION 1. The landing should be performed with the flap and landing gear position existing at the moment of the engine failure, performing smooth obstacle avoidance maneuvers, where it is possible.
2. DO NOT TRY TO RETURN TO THE AIRPORT.

5.4 Engine failure at a high altitude

If the engine fails at an altitude above 100 m, set the speed to 120… 130 km/h and make three attempts to restart the engine by means of the START button.

NOTE 1. Maximum gliding range will be achieved at a speed of 125 km/h (in still-air conditions: 4.5 km - from an altitude of 300 m, 3 km - from 200 m, 1.5 km - from 100 m) at a descent rate of about 5… 7 m/s .

If it is impossible to restart the engine in flight, execute an emergency landing, for which purpose either use the rescue system (see part 0) or executing a running landing (see part 0).

5.5 Fire in the engine compartment on ground

5.5.1 Close the ventilation baffle to prevent smoke from entering the cabin.

5.5.2 Disable the FUEL PUMP toggle switch.

5.5.3 Disable the MASTER SWICH toggle switch.

5.5.4 Unlock the emergency exit, detach the door.

5.5.5 Egress the aircraft carrying with you with the on-board extinguisher.

5.5.6 If possible, call the ground service.

5.5.7 Start extinguishing using the on-board extinguisher.

CAUTION Depending on the situation, at the discretion of the pilot, make a decision to discontinue extinguishing and evacuate the occupants beyond the range of 50… 100 m.

5.6 Fire in the engine compartment in flight

5.6.1 Close the ventilation baffle to prevent smoke from entering the cabin.

5.6.2 Disable the FUEL PUMP toggle switch.

5.6.3 Disable the MASTER SWICH toggle switch.

5.6.4 Send a distress signal at the frequency of 121.5 MHz.

5.6.5 Unlock the emergency exit.

5.6.6 Make an emergency landing, either using the rescue system (see part 5.1) or executing a running landing (see part 0).

5.6.7 Egress the aircraft carrying with you with the on-board extinguisher.

5.6.8 If possible, call ground services.

5.7 Fire in the cabin

5.7.1 Extinguish the fire, using the on-board fire extinguisher.

5.7.2 Send a distress signal at the frequency of 121.5 MHz.

5.7.3 Unlock emergency exit, jettison the door (in flight).

5.7.4 Make an emergency landing, either using the rescue system (see part 5.1) or executing a running landing (see part 6.1).

5.7.5 If possible, call ground services fro rescue.

5.8 Unintentional spin

Spin entry requires special and conscious pilot action.

The spin is caused by sharp displacements of the aircraft control stick in roll or by sharp application of rudder pedals. Thus, unintentional entering the spin is almost impossible.

Howere if the spin does occur, follow these steps:

5.8.1 Pull the aircraft control stick all the way aft, keep it neutral in roll, apply the rudder pedals opposite to the aircraft rotation.

5.8.2 After stopping the rotation of the aircraft, sharply push the aircraft control stick beyond the neutral and after acceleration to the speed of **130… 160** km/h smoothly pulling the control stick and a gradually increasing engine operation setting, recover to straight and level flight:

NOTE 1. The maximum roll will be 80°, vertical load factor of 2.2… 2.6, negative pitch angle will be in average -50 °.

2. Maximum loss of altitude at recovery from spin will be up to 200 m, recovery in one incomplete volution (turn).

3. Serviceability of the engine, control system, fuel system are not impaired.

4. There are no significant efforts caused by aerodynamic forces attempting to displace the aircraft control stick towards the pilot.

5. The development of aircraft gyration in left and right spin is predictable, with an angular velocity of 60… 80°/s in the roll channel and 20… 30°/s in the yaw channel.

6. Operating speed (V_{NO}), rolls and vertical load factor are not exceeded during the recovery from spin.

If you fail to recover form the spin by specified actions, make an emergency landing,use for this purpose the rescue system (see part 0).

The page is reserved

PART 6. ACTIONS IN COMPLICATED SITUATIONS

CONTENT

Introduction

The part defines all the ANG-01 type aircraft procedures required for a safe completion of a flight in complicated flight conditions or in aircraft systems non-emergency failure situations, i.e. requiring no immediate action of the crew.

Complicated situations caused by malfunctions of the aircraft, its systems or engine, do not occur frequently with proper maintenance of the airplane.

ATTENTION 1. In case of a complicated situation, it is imperative to follow the procedures of the existing part in the sequence of their listing.

2. In any difficult situation, the primary task of the pilot is to maintain control of the aircraft and to fly safely to landing.

3. Failure to comply with these procedures may result in a severe aircraft accident.

6.1 Forced landing

To execute in case of complicated weather conditions that make impossible further flight, or under other cirmstances according to the decision of the crew.

Forced landing refers to the execution of an approach and running landing without use of the rescue system.

6.1.1 Estimate visually a level area.

NOTE 1. The paved road sections necessarily with low traffic intensity are preferable

2. Likely unproved landing areas: pastures, mowed areas (stubble). Avoid irrigation fields, sand strips, ice-covered water surfaces. The condition of the ground may be estimated by the depth of the track of the land transport.

6.1.2 Estimate the size of a likely landing site: it should be about 500… 600 m long, there should be no 5 m high obstacles on the landing heading 300 m short of the landing point.

6.1.3 Estimate the direction and speed of wind at ground.

NOTE 1. The wind direction is to be estimated visually by the direction of smoke, the inclination of plants, the ripples on water surface (the water surface will be smooth at the windward side of the shore).

2. Wind speed to be estimated by the difference between IAS and GS during the landing flight. Visual estimation may be used as an alternative method: a wind of about 5… 6 m/s tilts the tops of broad-leaved trees.

6.1.4 Send a distress signal at the frequency of 121.5 MHz, specify your location.

6.1.5 Maintain the speed at least of about 100 km/h prior to landing as well as the vertical velocity of V_Y = 2… 3 m / s.

6.1.6 Extend the flaps 30 ° at the altitude of 100 m, unlock the emergency exit (the door detents and pins on the required side, or on both doors, if the number of aircraft occupants is more than 1), extend the landing gear at the altitude of 50 m.

6.1.7 After the nose gear lowers on the run, apply the brake in proportion to the length of the landing site.

6.1.8 After stopping, switch off the engine, deenergize the aircraft and egress it.

6.2 Encountering a considerable turbulence zone

6.2.1 When encountering local thunderstorms and powerful cumulus clouds, bypass them with a margin of at least 10 km.

6.2.1 When flying between thunderstorm cells, the distance between them must be at least 20 km.

6.2.3 Maintain a speed of **140… 180** km/h.

6.2.4 Turns should be excuted with a roll, not exceeding 20 °.

6.2.5 When landing in wind shear conditions, execute a go-around, if it is eeded to increase for descent the engine power to maximum continuous or if V_Y variation per second exceeds 2 m/s.

6.3 Impairment of visibility

In the case of the impairment of the flight visibility caused by the approach of evening time or sudden change of weather conditions, execute a landing at the nearest airdrome (landing ground) or, execute a forced landing by the decision of the crew, in accordance with 0.

6.4 Icing

Due to the absence of the aircraft glazing and airframe anti-icing system (only Pitot tube heating is available), flying into icing conditions is FORBIDDEN.

WARNING Flying into icing conditions is dangerous, since the loss of the wing and propeller blade lifting properties (streamline impairment), increase of vibration due to the propeller operation (uneven ice accumulation on the blades), impairement of the visibility outside the cabin are possible.

In case of inadvertent icing encounter:

6.4.1 Execute a reverse turn or change the altitude in order exit the icing zone as soon as possible.

6.4.2 Set the the engine operation to maximum continuous.

6.4.3 Execute landing at the nearest aerodrome (landing ground) or, by decision of the crew, execute a forced landing in accordance with 0.

6.5 Pitot tube malfunction

This may occur due to the clogging of the inlet following the ingestion of foreign objects, dirt particles or insects, and may be associated wit the failure of the heating controller in the event of an inadvertent icing encounter.

6.5.1 Do not use the altitude, speed, and variometer readings of the primary system and redundant instruments.

6.5.2 Maintain the ground speed GS = 180 km / h. The instrument speed is to be estimated indirectly by the attitude indications with a sufficient stall margin (3… 5°).

6.5.3 Excute landing at the nearest aerodrome (landing ground) or, by decision of the crew, executed forced landing in accordance with 0.

6.6 Failure of the primary flight navigation system

6.6.1 Use altitude, speed, and variometer readings of the redundant instruments.

6.6.2 Set the speed of about **120… 160** km/h.

6.6.3 Set a medium engine operating condition (engine control lever to 30… 70%, set the variable pitch propeller selector to a rotation speed not exceeding 5000 rpm), which is to be assessed by the noise from the engine operation.

6.6.4 Restart the system by re-switching the AVIONIC toggle switch.

6.6.5 Execute landing at the nearest aerodrome (landing ground) or, at decision of the crew, execute forced landing in accordance with 0.

6.7 Power supply failure

It is indicated by the red light of the associated annuciator, which indicates the battery power supply for all on-board electrical consumers, except for the engine control and the primary flight equipment (they have their own emergency power sources).

Continue flying for maximum 30 minutes, or land at the nearest aerodrome (landing ground) or, at the decision of the crew, execute forced landing in accordance with 0.

6.8 Rudder trim tab failure

It is perceived by a noticeable increase of the control stick force in the longitudinal (pitch) channel. Continue the flight.

6.9 Flap failure

It is observed by the absence of the LED light, indicating flap position after setting their respective position.

6.9.1 Assess the position of the flaps visually.

6.9.2 If the flaps are not retracted after takeoff, it is not recommended to conduct a flight, exceeding 30 minutes duration. (the fuel consumption will increase).

6.9.3 If the flaps are not extended before landing, execute it, following the usual procedure (see part 0), but at a speed, increased by 10 km/h relative to the V_{REF} speed.

6.10 Landing gear failure

It is indicated by the absence of the landing gear position LED green light for each LG after setting the respective position (retracted or extended) and by the presence of of the red diode light for the intermediate position. The failure may be of mechanical or electrical nature.

If the landing gear is not extended before landing, do the following:

6.10.1 Discontinue the approach, set the level flight speed to about **120… 130** km/h.

6.10.2 Set the three-way landing gear emergency extension tap (in the armrest) to the red mark.

NOTE In this case the carbon dioxide cylinder pressure nozzle opens (above the tap), the pressure of this gas is applied to the slide valve moving it to close the pressure line of the hydraulic unit and pressing on the piston in the rod cavity of each cylinder.

6.10.3 Check the light indication for the extended position of all LGs.

6.10.4 In the absence of the LED green light, indicating the extended position of each landing gear, replace the carbon dioxide pressure bottle (a spare bottle is fitted in the armrest casing) and repeat the part 0.

6.10.5 Execute landing, following common technique (see part 0).

The page is reserved

PART 7. AIRCRAFT PERFORMANCE

CONTENT

Introduction

The nomograms provided in the nomogram part are needed to calculate the the aircraft perofrmance at all the basic flight phases: take-off, climb, level flight, descent and landing.

7.1 Introduction

The nomograms provided in this part account for the effect of:

- ✓ Operating speed limits;
- ✓ the actual mass of the aircraft;
- ✓ runway parameters (size, type and condition);
- ✓ meteorological conditions (pressure, temperature, wind direction and velocity).

It is advisable to perform the nomogram calculation in the course of preparation for EVERY flight.

It is permissible to perform the calculation once at the beginning of the flight day, provided that take-off and landing are to be executed at the same aerodrome (landing site), if a number of flights with similar (within 10%) mass of aircraft, meteorological conditions, condition and type of runway is planned.

CAUTION 1. Flight is FORBIDDEN when the calculated distances exceed the actual length of the runway with stopway (aborted take-off).

2. Flight is FORBIDDEN in case of impossiblity to provide the fuel for a flight of desired range and duration.

In these cases, the options are:

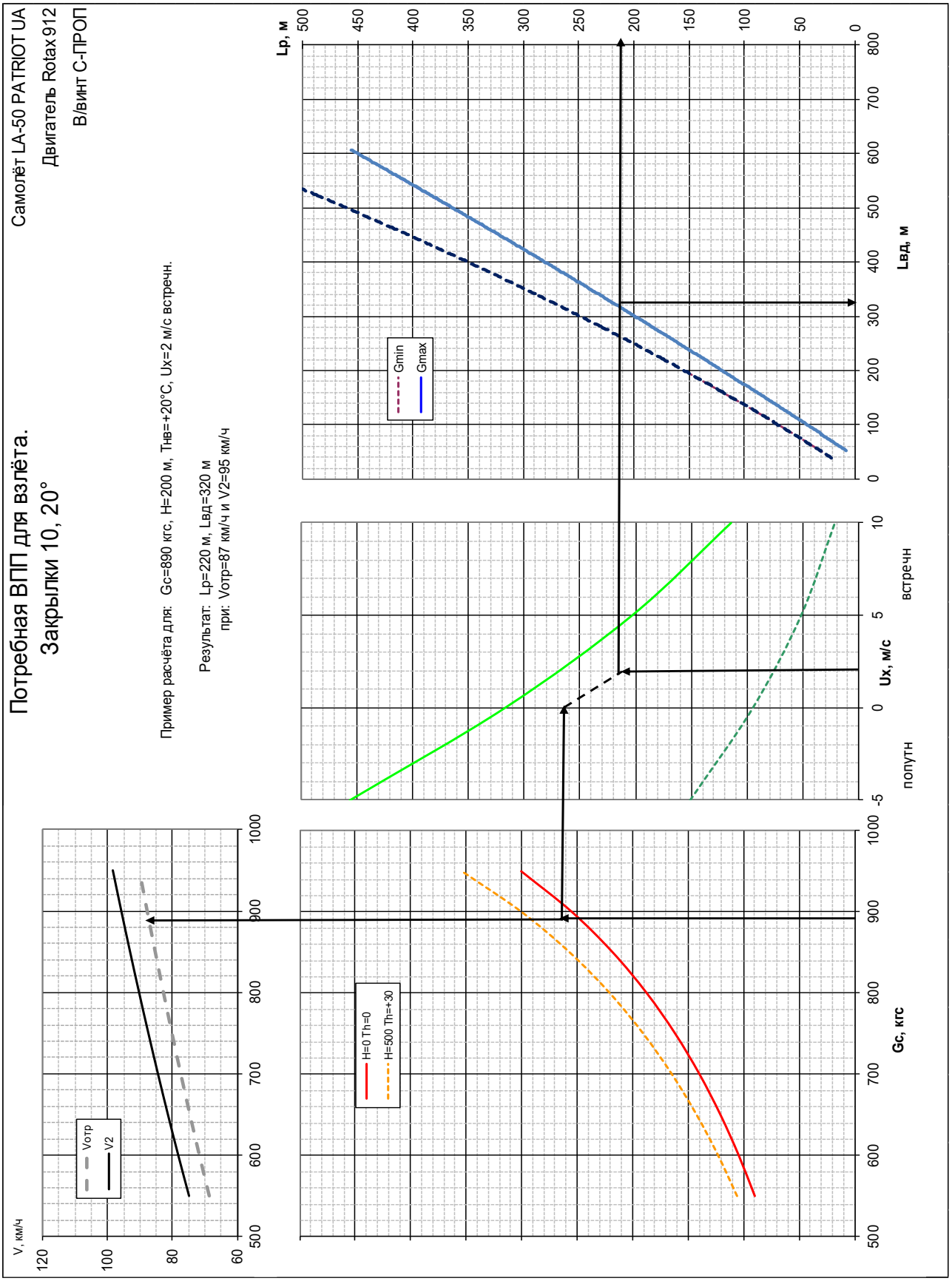
1) reduce the mass of the aircraft by reducing the number of crew, passengers or luggage;
2) reschedule the flight route (if possible);
3) await more favorable meteorological conditions that will ensure the specified range, duration and requisite runway.

Nomogram data are calculated for the forward C.G. limit (worst case).

The general principle of using nomograms is simple: at the entrance of each "rug" [rectangle] (in the bottom or left part) mark along the axes the initial parameter values and proceeding visually or moving a pencil along the nomogram lines to the reference lines (*a vertical line for the wind of 0 m/s*), proceed to the line of the next "rug" [rectangle]..

7.2 Take-off

7.2.1 Takeoff distance, run length, characteristic speeds



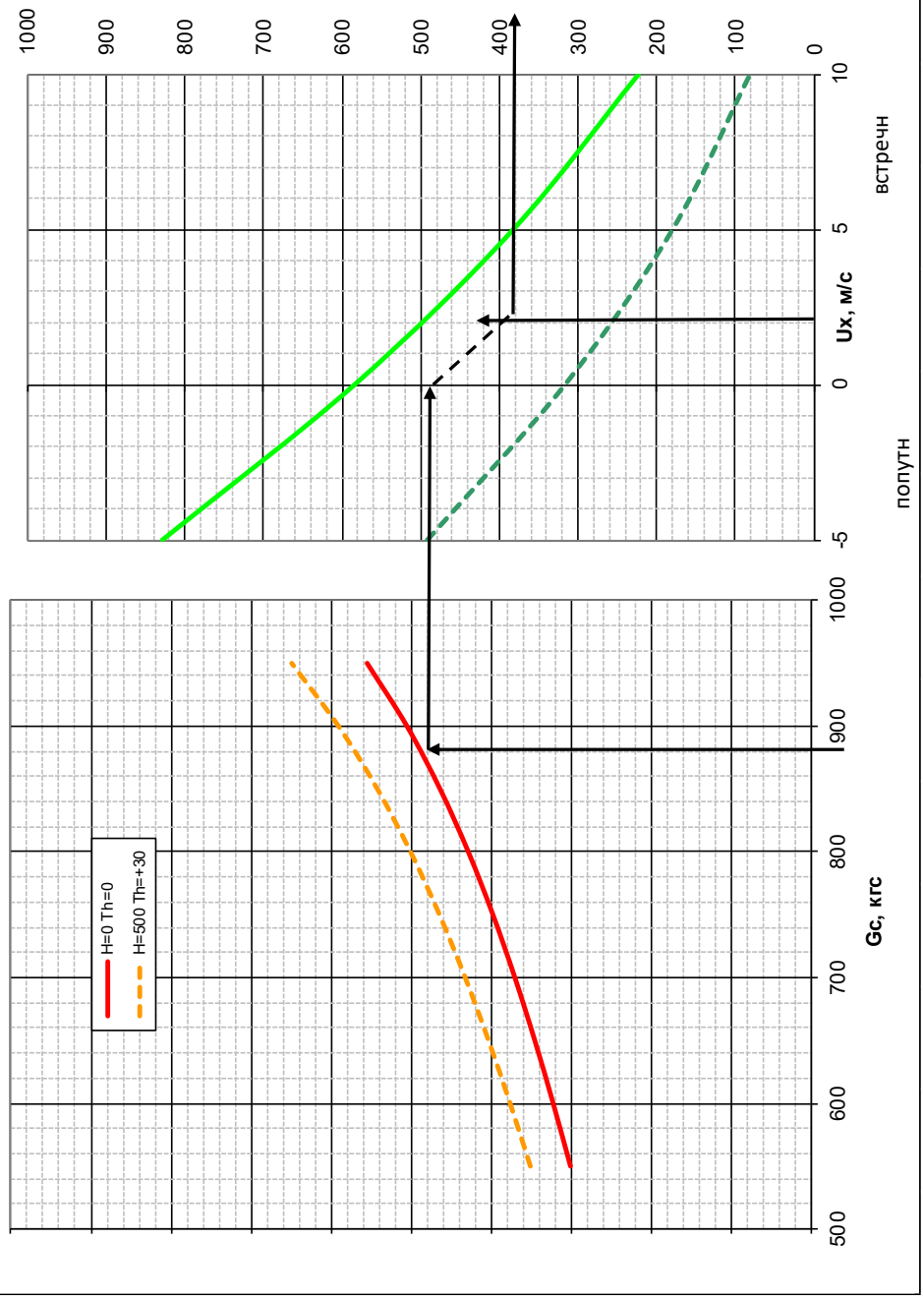
7.2.2 Aborted flight

Самолёт LA-50 PATRIOT UA
Двигатель Rotax 912
В/винт С-ПРОП

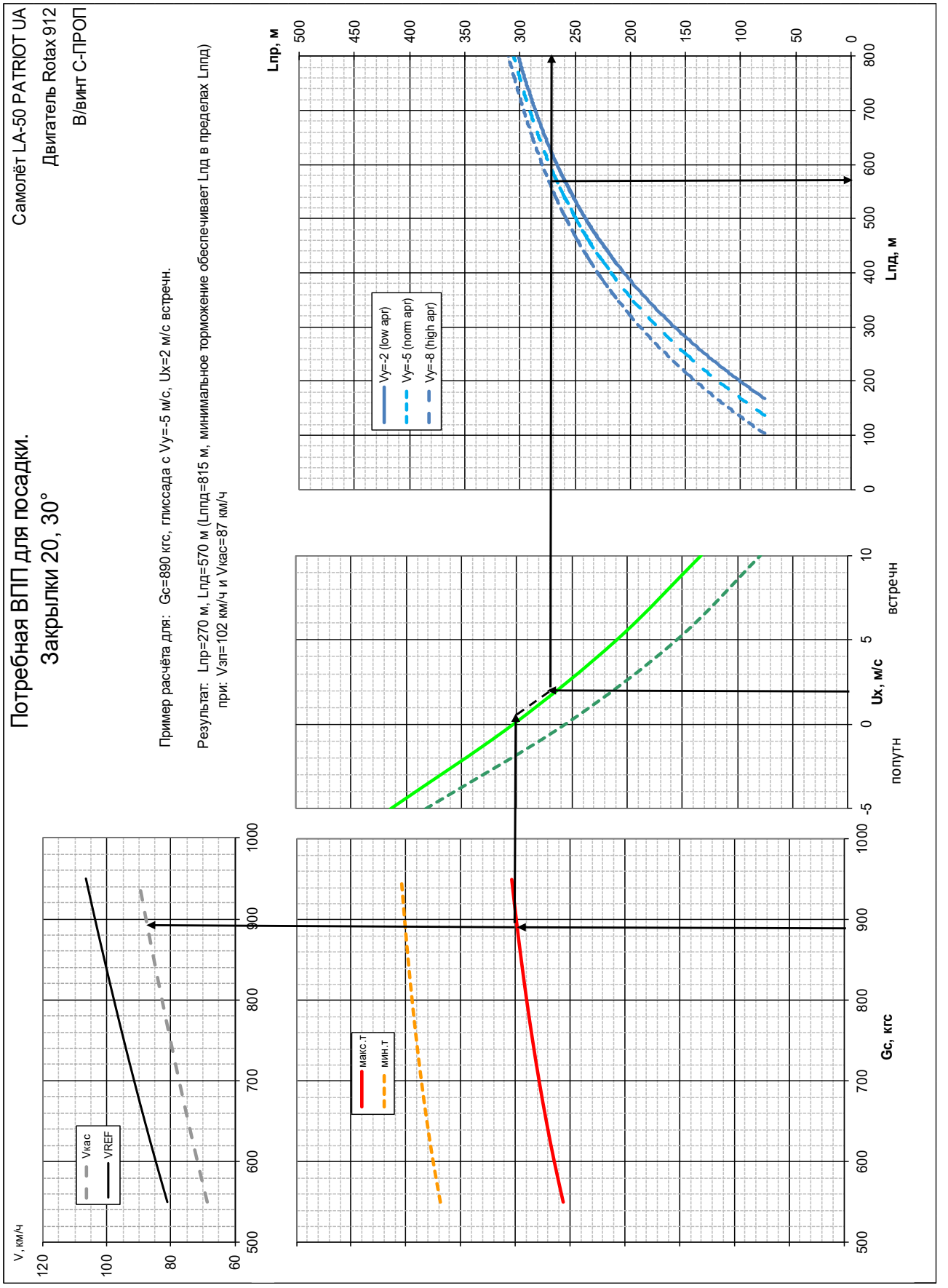
Потребная ВПП для прерванного взлёта.
Закрылки 10, 20°

Пример расчёта для: Gc=890 кгс, H=200 м, Тнв=+20°C, Ux=2 м/с встречн.

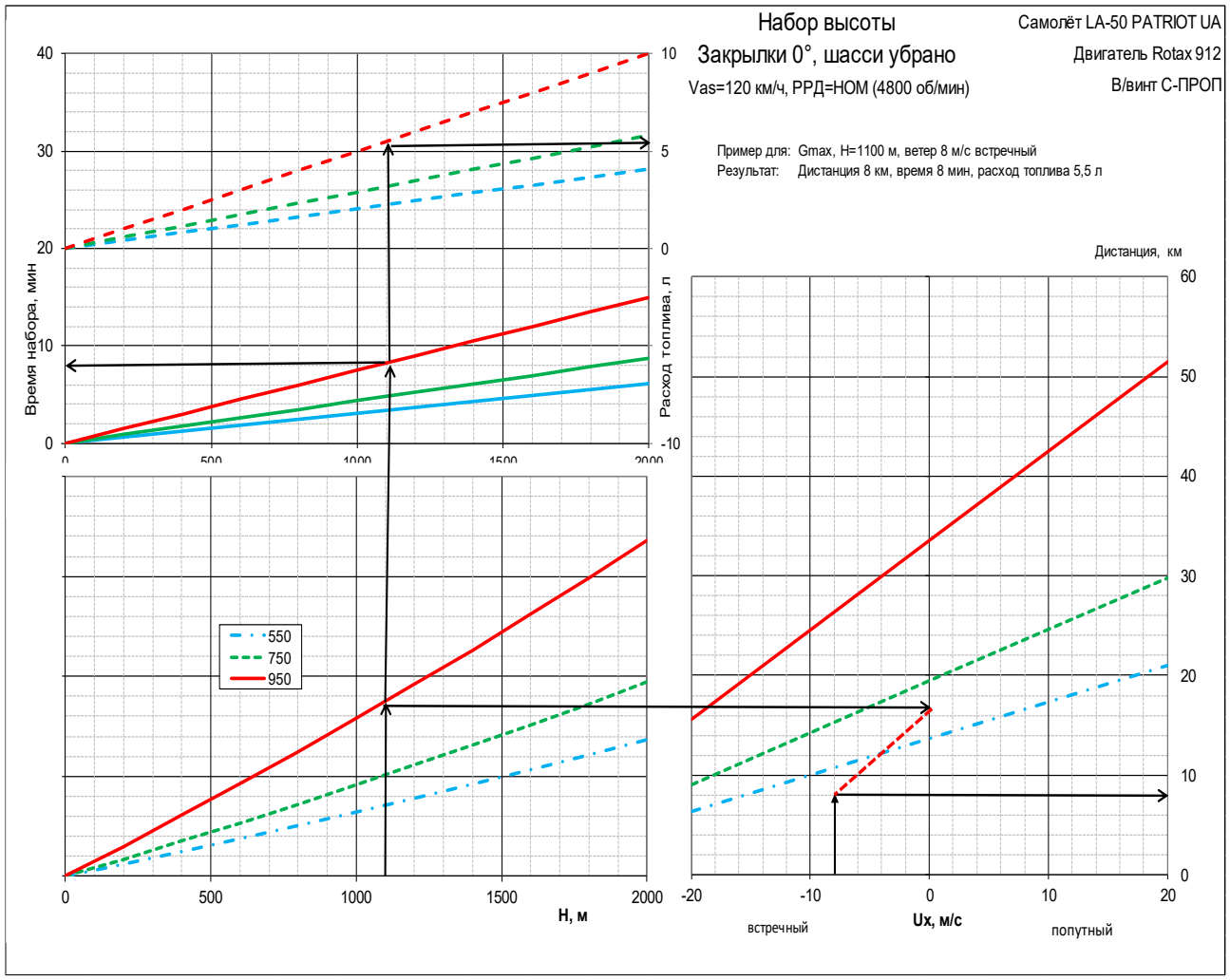
Результат: Lдпв=430 м



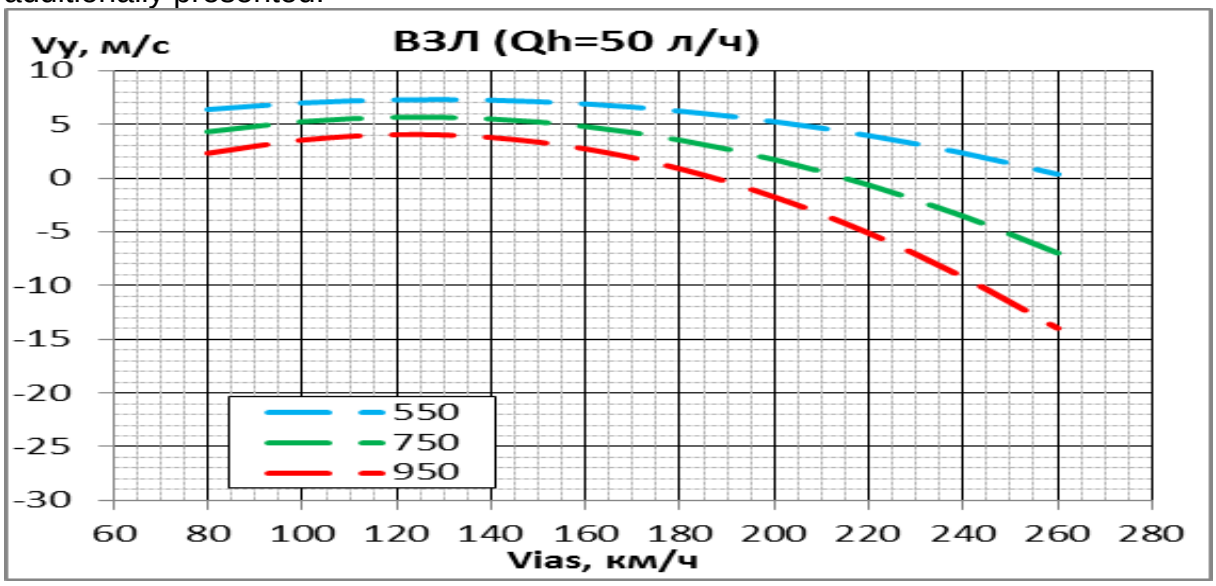
7.3 Landing


Потребная ВПП для посадки.
Закрылки 20, 30°
Самолёт LA-50 PATRIOT UA
Двигатель Rotax 912
В/винт С-ПРОП
Пример расчёта для: Gc=890 кгс, глиссада с Vy=-5 м/с, Ux=2 м/с встречн.
Результат: Lпр=270 м, Lпд=570 м (Lппд=815 м, минимальное торможение обеспечивает Lпд в пределах Lппд)
при: Vзп=102 км/ч и Vкас=87 км/ч
Lпр, м
Lпд, м
Vy=-2 (low apr)
Vy=-5 (norm apr)
Vy=-8 (high apr)
Ux, м/с
встречн
попутн
V, км/ч
Vкас
VREF
Gc, кгс
макс.Т
мин.Т

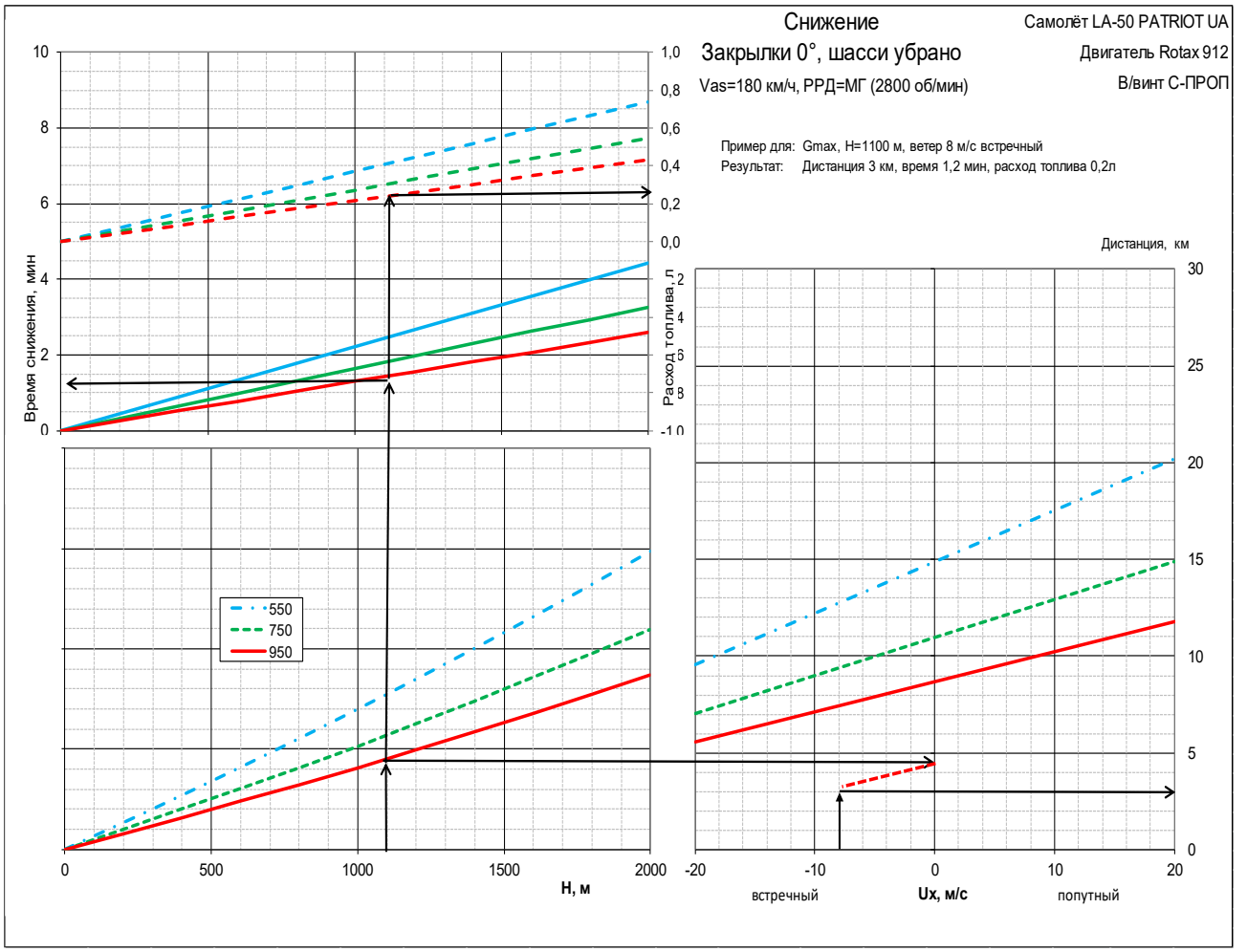
7.4 Climb



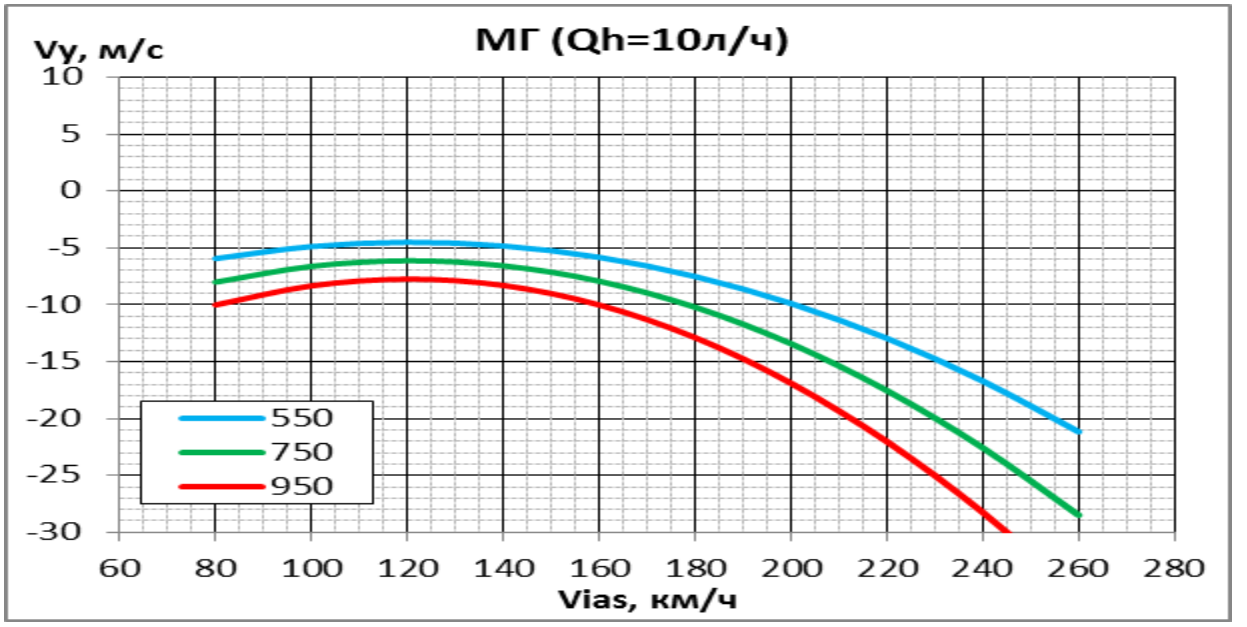
The dependence of vertical velocity on IAS at maximum continuous power setting is additionally presented.



7.5 Descent



The dependence of vertical velocity on the IAS at idle setting is additionally presented.



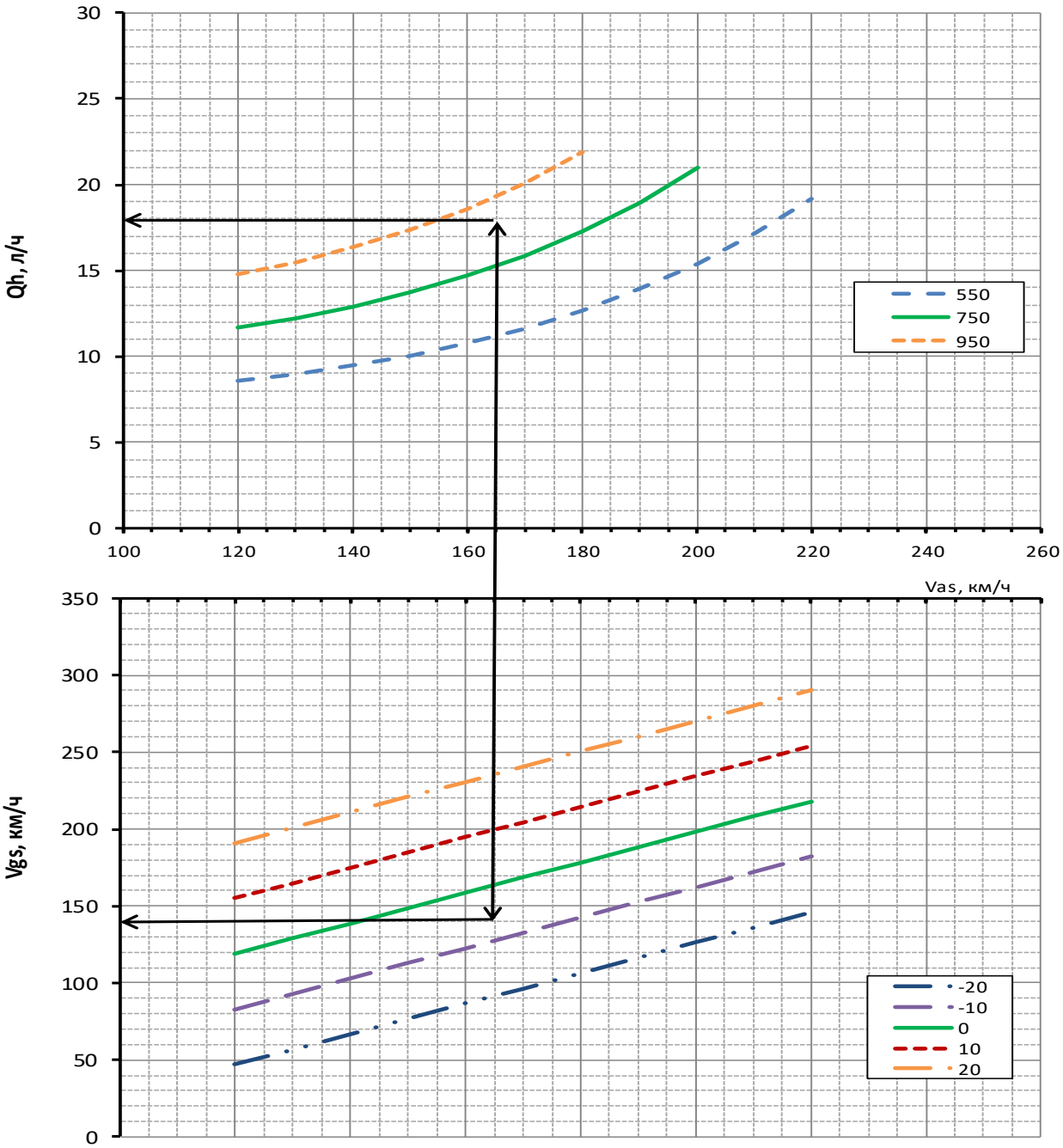
7.6 Flight range and duration

Дальность, расход топлива
Закрылки 0°, шасси убрано

Самолёт LA-50 PATRIOT UA
Двигатель Rotax 912
В/винт С-ПРОП

Выпущенное шасси увеличивает расход топлива или уменьшает скорость на 15 %
Поправка путевой скорости + 10 км/ч па каждый 1 км высоты
Аэронавигационный запас топлива 10% от заправки

Пример для: Gc=890 кгс, высота 1200 м, Приборная скорость 165 км/ч, Ветер 6 м/с встречный
Результат: Расход топлива 18 л/ч
Путевая скорость 152 км/ч (140 км/ч для высоты 0 + поправка на высоту 12 км/ч)
При заправке 90 л обеспечивается дальность 684 км (=152*(90-9)/18)



Inscriptions on the nomograms:

7.2 Take-off

Самолёт - Aircraft
Двигатель – Engine
В/винт – Propeller
Потребная ВПП для взлёта – Requisite runway for take-off
Закрылки 10, 20 – Flaps 10,20
Пример расчета - Example of calculation
Результат – Result
При попутн. - with tail wind
встреч. – head wind
кгс - kgf

7.2.2 Aborted flight

Потребная ВПП для прерв. полета – Requisite runway for aborted flight
Закрылки 10, 20 – Flaps 10,20
Пример расчета - Example of calculation
Результат – Result
попутн. - tail wind
встреч. – head wind

7.3 Landing

Потребная ВПП для посадки – Requisite runway for landing
Закрылки 20, 30 – Flaps 20, 30
Пример расчета - Example of calculation
попутн. - tail wind
встреч. – head wind

7.4 Climb

Набор высоты – Climb
Закрылки 0 – Flaps 0

РРД = НОМ - Engine continuous power setting
Шасси убрано – LG retracted
Пример для расчета - Example for calculation
Ветер встречный 8 м/с - Head wind 8 m/s
Результат: Дистанция 8 км – Result: Distance 8 km
Время: 8 мин., - Time 8 min.,
Расход топлива 5,5 л – Fuel consumption 5.5L
Дистанция км – Distance km
Время набора мин. – Climb time
ВЗЛ л/ч – Take-off l/h
Км/ч – km/h

7.5 Descent

Снижение - Descent
Закрылки 0 – Flaps 0
Шасси убрано – LG retracted
Пример: ветер 8 м/с, встречный – Example: head wing 8 m/s
Результат: Дистанция 3 км – Result: Distance 3 km
время 1,2 мин – time 1.2 min
расход топлива 0,2 – Fuel consumption 0.2
Дистанция км. – Distance km

7.6 Flight range and duration

Дальность, расход топлива – Distance, fuel consumption
Выпущенное шасси увеличивает расход топлива или уменьшает скорость на 15% - Extended LG increases the fuel consumption and reduces speed by 15%
Поправка путевой скорости +10 км на каждый км. высоты – Ground speed correction +10 km per each km. of altitude
Аэронавигационный запас топлива 10% от заправки – En-route fuel reserve 10% of fill-up amount
Пример GC 890 кгс – Example GC 890 kgf
Высота 1200 м приборная - Instrument altitude 1200 m
Скорость 165 км/ч – Speed 165 km/h
Ветер 6 м/с встречный – Head wind 6 m/s
Расход топлива 18 л/ч – Fuel consumption 18 l/h
Путевая скорость 152 км/ч – Ground speed 152 km/h
(140 км/ч для высоты 0 + поправка на высоту 12 км/ч)
(140 km/h for altitude 0 + altitude correction 12 km/h)
При заправке 90 л обеспечивает дальность 684 км (=152*(90-9/18)
The fill-up amount of 90L ensures the range of 684 km (=152*(90-9/18)