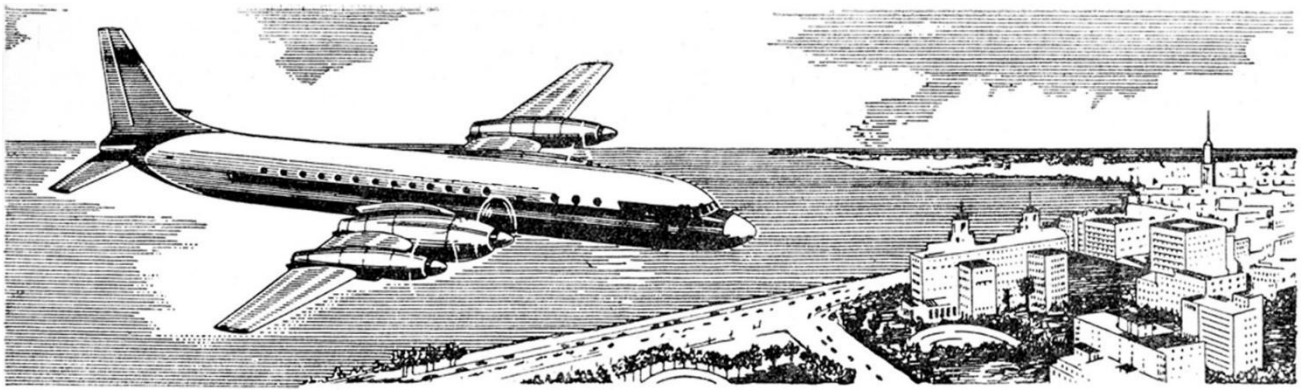
ILYUSHIN IL-18

Passenger and Cargo Aircraft

for Microsoft Flight Simulator 2024



TECHNICAL DESCRIPTION

PART 3 – PROCEDURES

by Nemeth Designs Aviation Bureau

PROCEDURES

I. PRE-TAXI AND TAXI OPERATIONS

Taxiing to the holding point is permitted on the two inner engines (No. 2 and No. 3), subject to approval from the controller. The outer engines should be started at the holding point or another designated area, provided there is communication between the crew and the ground technician, and fire-extinguishing equipment is available.

Before taxiing, the engines must be warmed up at ground idle (0^{o} on the UPRT [Thrust Lever Position Indicator]).

1. Check if the nose gear steering is engaged.
2. Ensure that:
    - The propeller pitch stop switches are in the "REMOVED FROM STOP" position (eight red warning lights should be illuminated);
    - The main engine start system switch is in the "OFF" position;
    - The four warning lights under the "Chip in oil" placard are not illuminated.
3. Release the parking brake and check the pressure in the main brakes using the gauges; increase the engine power setting until the aircraft begins to move. After movement starts, adjust the engine power setting accordingly proportional to steering speed and apply brakes as necessary.

Warnings

- Engine Settings: Set engine modes as needed. Speeds must be balanced (94,5-98.2%).
- Oil Temperature: During taxiing (at 0.2 nominal mode or below) with oil cooler shutters open, inlet oil temperature should not exceed 100 ^{0}C. Operation at 100 ^{0}C is limited to 15 minutes before takeoff.
- Idle Limits: Continuous engine operation at idle (start/taxi) must not exceed 30 minutes. Use outboard engines primarily when taxiing on unpaved ground.
- Throttle Movement: Move throttles smoothly.

Course System Alignment

When taxiing toward the lineup position with a known azimuth:

- Set the "MAIN-STBY" switch to "MAIN".
- Use the "COURSE SETTER" to input the magnetic (or true) azimuth of the taxiway/runway on the scale.

4. Control turns using the nose gear and brakes. Do not leave the nose wheel in a fully turned position when stopping. The turning radius must be at least half the wingspan (19 m).

Critical Flight Safety Warnings

- SPEED LIMIT: Turns at speeds exceeding 40 km/h are PROHIBITED.
- RADIUS LIMIT: Tightening turns beyond permissible radius can cause landing gear failure.
- PIVOT TURNS: Turning the aircraft around a stationary main landing gear bogie is PROHIBITED.
- HEATING: Set cockpit window heating to "Low" mode.

II. PRE-FLIGHT SYSTEM CHECKS

1. Check the automatic propeller feathering system (via torque meter) before the flight at the lineup position. Test two symmetrical engines simultaneously (outboard first, then inboard) proportionally to the steering speed and apply brakes as necessary.

    - set the operating mode of the outboard engines to no less than 0.7 of the nominal rating (61-63^{0}) according to the UPRT [engine power indicator]) and ensure that the green lamps "Autofeather readiness" are lit;
    - ensure that the propeller pitch stop removal switch is in the "Propeller removed from stop" position and the red warning lamps for oil pressure in the FSH and MSH channels are lit;
    - turn on the corresponding push-button switches for testing the automatic feathering equipment;
    - move the outboard engine control levers to the idle position (0^{0} according to the UPRT); the functionality of the automatic feathering system is monitored by the illumination of red warning lamps indicating the activation of autofeather sensors in the feathering buttons, green lamps of the feathering pumps, and by the extinguishing of the green lamps "Autofeather readiness"; the illumination of the feathering pump lamps indicates that the feathering pumps and feathering time controllers have begun operation, but the propeller blades move to the minimum angle and the engines continue to operate normally at idle;
    - interrupt the operation of the feathering pumps by pulling out the feathering buttons; at this point, the feathering pump lamps and the red lamps in the feathering buttons must go out;
    - turn off the push-button switches for testing the automatic feathering system; the operation of the automatic feathering system for the inboard engines is checked in the same sequence as for the outboard ones.

Note: Four green signal lamps for autofeather readiness remain lit throughout the flight when the engine operating mode exceeds 56 +/- 2^{0} according to the UPRT. If any of the "Autofeather readiness" lamps fail to illuminate, takeoff procedures should not proceed. If a green "Autofeather readiness" lamp extinguishes during flight, verify the standard operation of the engine using the onboard monitoring instrumentation.

2. The minimum incoming oil temperature before takeoff and at all stages of flight must be no lower than +50^{0}. (After the incoming oil has warmed up to +50^{0}, shift the engines to 0.6 nominal mode and back to warm up the cylinder groups of the propellers).
3. Before taxiing to the line-up (active) start, extend flaps to 15^{0}, remove the safety pin for the landing gear buttons from the socket, and open the emergency feathering cover.
4. During taxiing and turning the aircraft, ensure that:
    - All attitude indicators do not change bank and pitch readings; the turn needle deviates in the direction of the turn and the flags are retracted
    - The course system indicators show a change in heading during turns
    - The green signaling lamp for normal operation correction cutout is not lit on straight taxiing sections (it may light up briefly during aircraft turns)
5. Ensure that the rudders and ailerons are unlocked
6. When taxiing in winds over 15m/s, perform it with locked rudders and ailerons. Unlock rudders at the line-up start.
7. During taxiing before the holding point, set the radio altimeter set-height signaling switch to a value of 100m.

III. PREPARATION FOR TAKEOFF

1. Taxi onto the runway and align the aircraft along the takeoff centerline. To do this, taxi forward 3–5 m in the takeoff direction to ensure the aircraft and nose wheels are positioned correctly. Brake the aircraft wheels. Set the aircraft on the parking brake at the line-up position. Check the aircraft's readiness according to the pre-takeoff checklist. Set the propeller pitch lock switches to the "Propeller on stop" position. The oil pressure warning lights for the high-pitch and low-pitch channels must go out.

Takeoff is prohibited if:

- Propellers are in the "Propeller off stop" position.
- The pressure drop warning light in the pitch lock channel or the pressure increase light in the low-pitch channel is lit.
- Any emergency warning panel is illuminated.

1. **Verify gyro readiness** using the ACHS-1 stopwatch. After turning on the heading system gyro units, attitude indicators, and vertical gyros, ensure the following warm-up times have passed based on cabin temperature:
   - 3 min: +20C^0 and above.
   - 5 min: +19 C^0 to -30 C^0.
   - 6 min: -31C^0 to -60 C^0.

3. **Final Pre-Takeoff Checks**

   Before takeoff, ensure once again that:

   - The aircraft silhouette on all attitude indicators is horizontal and aligns with the horizon line. When turning the pitch knob on the indicator, the pitch scale should move; after checking functionality, set the pitch scale to zero.
   - Power failure indicators are off

Final Checks:

- Ensure that takeoff headings are set on the heading indicators.

Heating and Trim Settings

1. Before takeoff, turn on the pitot (TP-156M) heating. Activation should occur:
   a. At positive outside air temperatures — 1 minute before takeoff.
   b. At zero and negative temperatures — 3 minutes before takeoff.
2. If takeoff is delayed by more than 2 minutes, turn off the pitot (TP-156M) heating and turn it back on as indicated above.
3. Before takeoff in icing or snowfall conditions, after removing the covers from the pitot receivers, turn on their heating for 2 minutes to warm up; if takeoff is delayed, repeat this activation after 10 minutes.
4. Set the elevator trimmer "toward you" (for pitch up/nose up) by 1—1.5°.
5. Takeoff Command: After receiving clearance from the ATC for takeoff, the aircraft commander gives the command to the crew to begin the takeoff.

IV. TAKEOFF

Takeoff with Brakes

During takeoff, the crew must closely monitor the aircraft's behavior and instrument readings, controlling the operation of the engines; if signs of a power plant failure appear, immediately feather the faulty engine.

Takeoff is performed in the following sequence:

1. Holding the aircraft on the brakes, smoothly, over 5–8 seconds, move the control levers for the two outer engines to the takeoff mode. The flight engineer must report to the aircraft commander that the outer engines have reached takeoff mode.
2. Smoothly, over 5–8 seconds, move the control levers for the internal engines to takeoff mode. The flight engineer must report to the aircraft commander that the internal engines have reached takeoff mode.

Warning: Takeoff mode is permitted only for aircraft takeoff up to the pattern altitude and for a go-around.

3. Smoothly release the brakes.
4. After moving the engines to takeoff mode, the flight engineer holds the thrust levers in the extreme forward position until the decision speed V_1 is reached, being ready to remove takeoff mode upon the command of the aircraft commander. Upon reaching the decision speed, the flight engineer locks the thrust levers.
5. The takeoff run of the aircraft is to be performed with the nose gear pressed down until the nose gear lift speed V_R. Maintain the takeoff direction in the first half of the run by manually controlling the nose gear, and as the speed increases—by the rudder. During the takeoff run, the navigator calls out the decision speed V_1, the nose gear lift speed V_R, the liftoff speed V_{LO}, and the climb speed to the pattern altitude according to the airfield chart, but not less than 250 km/h (V_2 + 15 km/h for takeoffs from airfields with noise restrictions, and V_2 + 30 km/h for takeoffs from airfields without noise restrictions). Other conversations during the takeoff period are prohibited, except for reports of malfunctions that may threaten takeoff safety.
6. Upon reaching the nose gear lift speed, the pilot should turn off the nose gear steering and, with a vigorous but not abrupt movement of the control column, raise the nose gear at a rate that brings the aircraft to a takeoff pitch angle of 4–5° by the time the aircraft lifts off the runway. At the same time, by the moment of liftoff, the aircraft's speed increases by approximately 10–15 km/h compared to the speed at the start of the nose gear lift.
7. After liftoff, continue accelerating the aircraft while climbing until the safe takeoff speed V_2 is reached. Safe speed must be reached near the ground (up to a height of 10 m).
8. During the process of accelerating the aircraft to a safe speed at a height of at least 5 m, retract the landing gear.
9. Accelerate the aircraft to a speed of V_2 + 30 km/h (but not less than 270 km/h) and continue climbing with the flaps in the same position to a height of at least 120 m. At a height of 120 m, retract and lock the flaps at a speed of at least 290–300 km/h and continue climbing while accelerating to a speed of 390 km/h.

Considerations

1. Retracting flaps and reducing takeoff power during turns is prohibited.
2. If it is necessary to perform a turn during flap retraction, the retraction must be suspended and continued only after the turn is complete.

   Ensure the flap retraction lock is secured. The handle must remain in this position throughout the flight until flaps are deployed for landing.

3. At an altitude of 400 m, provided there is no bank and within 4–6 seconds:
    - Switch internal, then external engines to nominal power mode.
    - Engage the altitude system.
    - Set oil radiator shutter switches to "Auto" (if they were manual for takeoff).
    - Close the emergency feathering cover.
4. For takeoffs from airfields with noise restrictions or when a steep climb is required to ensure a safe V_2 speed:
    - Transition to climb mode and accelerate to V2 + 15 km/h (minimum 250 km/h).
    - Maintain constant speed and flap position until reaching 400 m or the designated pattern altitude.
    - The first turn with flaps at 15^0 is permitted at speeds no less than 280 km/h.
2. Accelerate the aircraft. At V_2 + 30 km/h (minimum 290-300 km/h), retract and lock the flaps.

3. Before entering clouds, the commander must verify the attitude indicators. Perform a slight rocking of the aircraft (bank up to 5^0). All three indicators must react without delay and show identical bank/pitch angles.

5. When crossing the transition altitude and leaving the airfield area, set altimeters to 760 mm Hg.
6. Engage the autopilot at an altitude of at least 400 m.
    - Before engagement: Ensure the AT-2 switch is "On" and "Turn," "Descent-Climb," and "Bank" knobs are neutral.
    - Turn on "Lateral," "Longitudinal" AP switches.
    - Trim the aircraft in steady level flight.
    - Once lateral and longitudinal centering is complete (indicated by "Prep" on a yellow background), press "On AP". The indicators should change to "On" on a green background.
    - Press "On altimeter" if altitude stabilization is needed.

WARNING: In the event of an engine failure during takeoff, it is forbidden to increase the remaining engines to takeoff power until the aircraft has lifted off, as this severely disrupts the aircraft's balance. Increasing to takeoff power on the working engines is to be done only after liftoff and positive separation from the ground.

Takeoff in crosswind

- The maximum allowable crosswind component (at a 90^0 angle to the runway) for takeoff is 18 m/sec.
- The takeoff roll must be performed while maintaining control of the aircraft's nose gear up to speed V_R.
- After liftoff, counteract drift by adjusting the aircraft's heading by the drift angle.

Takeoff in tailwind

1. Takeoff is permitted with a headwind of up to 25 m/sec.

   When airport winds exceed 15 m/sec, taxiing to the start must be done with locked controls. Unlock the controls only at the line-up position.

   Check control surface deflection before takeoff.
2. Takeoff with a headwind should be performed according to the recommendations:

   Liftoff speed must be increased:

- By 10 km/h for winds of 10–15 m/sec.
- By 20 km/h for winds of 15–25 m/sec.

The rotation speed (V_R) is increased accordingly.

3. Takeoff is permitted with a tailwind of up to 5 m/sec.

   The liftoff speed during a tailwind takeoff must be increased by 10 km/h.

V. CLIMB

1. The climb is performed at nominal engine power at indicated airspeeds specified in Table 1, depending on the altitude temperature conditions and aircraft modification.

Note: The use of takeoff mode at an altitude higher than the circuit altitude is not permitted, except in cases where it is necessary to ensure flight safety. In such instances, the continuous engine operation time in takeoff mode must not exceed 15 minutes.

Table 1

RATE OF CLIMB							
ALTITUDE (m)	SPEED (IAS km/h)	Takeoff weight 56t			Takeoff weight 61.2t		
		Time (min)	Distance (km)	Fuel used (kg)	Time (min)	Distance (km)	Fuel used (kg)
0	390	0	0	0	0	0	0
1000	390	2	13	125	2,5	15	140
2000	390	4	28	250	5	32	290
3000	390	7	45	380	7,5	52	450
4000	390	9	62	500	10,5	72	590
5000	380	12	83	630	13,5	98	730
6000	370	14	105	755	17	125	890
6300	365	15	112	800	18	135	940
6600	365	16	120	840	19,5	146	1000
6900	360	17	128	880	21	158	1050
7200	360	18	140	925	22,5	172	1115
7500	355	19	150	980	24	186	1180
7800	350	21	160	1040	26	203	1260
8100	350	23	178	1100	28	220	1340
8600	345	27	210	1220	33	265	1530
9100	345	32	250	1380	-	-	-

Warning. It is forbidden to decrease speed during climb below V_{IAS} 345 km/h or to exceed a speed of V_{IAS} 510 km/h.

Flight Weight and Altitude

Flight weight, which determines the maximum allowable flight altitudes, is given in Table 2.

Table 2

MAXIMUM PERMISSIBLE FLIGHT ALTITUDES	
Weight (kg)	Maximum altitude (m)
63000	7800
58500	8600
55500	9100
52500	9600
50000 or less	10100

2. Check the operability of the **de-icing systems** for the tail unit, wing, and propellers

3. During a climb without bank, when piloting by the artificial horizon, the aircraft's heading should not change.

VI. CRUISE

1. At the assigned flight level, set the engine power setting required for level flight, but no higher than 0.85 of nominal (not higher than 72º on the UPRT [Propeller Pitch Indicator]) and no lower than 56º, to avoid triggering the automatic feathering system.

Note: Use of takeoff and nominal power settings at flight level is not permitted, except in cases where the use of these settings is necessitated by flight safety requirements (avoiding a thunderstorm front, flight in icing conditions, high outside air temperatures, engine failure, or flight in heavy precipitation). In these cases, continuous engine operation at takeoff power must not exceed 15 minutes; operation at nominal power is unrestricted. In exceptional cases of engine failure while flying over high mountain ranges, it is permitted to continue the flight with the remaining engines at takeoff power without time limits until it is possible to reduce the engine power setting to nominal or below. When using takeoff or nominal power settings at flight level, the date, reason for using takeoff power, altitude, and duration of operation at these settings must be recorded in the aircraft logbook and the equipment performance report.

2. Data on cruise level flight settings within the range from minimum speed to maximum speed are given in Table 3 and on the cruise charts. When flying with a headwind (tailwind), increase (decrease) the indicated airspeed by 10 km/h for every 70 km/h of the headwind (tailwind) component.

3. Table 3 provides cruise speeds, hourly fuel consumption, and engine power settings for four groups of horizontal flight speeds:

    - Minimum speed setting: Corresponds to the minimum hourly fuel consumption and the maximum flight duration.
    - Minimum specific fuel consumption setting: Corresponds to the maximum flight range for a given fuel supply.

Table 3

CRUISE FLIGHT MODES													
Weight (t)	Altitude (km)	Longest flight endurance mode			Longest range mode			0.85 nominal mode			Nominal mode for special conditions		
		VIAS	VTAS	Fuel(kg)	VIAS	VTAS	Fuel(kg)	VIAS	VTAS	Fuel (kg)	VIAS	VTAS	Fuel (kg)
60	8,6	360	554	1900	391	596	2020	333	510	1830	395	600	2060
	8.1	360	539	1900	401	595	2070	370	550	1950	419	620	2190
	7,8	360	530	1900	406	594	2100	389	568	2020	431	630	2260
	7,5	360	521	1910	412	593	2130	405	581	2080	445	639	2330
	7,2	360	512	1910	417	591	2150	417	590	2150	457	646	2410
	6,9	360	504	1930	423	589	2180	429	597	2220	468	650	2480
	6,6	360	496	1950	428	587	2220	439	602	2280	478	653	2560
	6,3	360	488	1970	433	586	2250	448	605	2340	486	654	2620
	6,0	360	481	1990	438	585	2290	457	606	2400	494	655	2680
55	9,1	360	570	1800	376	592	1870	335	530	1730	388	612	1940
	8,6	360	554	1800	385	590	1910	374	569	1850	415	633	2080
	8,1	360	539	1800	395	588	1950	402	595	1920	438	648	2210
	7,8	360	530	1800	400	586	1970	414	605	2040	450	655	2290
	7,5	360	521	1800	405	585	2000	427	613	2100	462	660	2360
	7,2	360	512	1810	410	583	2030	438	620	2170	471	665	2440
	6,9	360	504	1830	415	580	2070	448	624	2230	482	668	2510
	6,6	360	496	1860	419	577	2100	457	626	2300	491	670	2580
	6,3	360	488	1880	424	574	2140	466	627	2360	499	673	2660
	6,0	360	481	1910	429	571	2180	472	628	2420	505	675	2720

At flight speed at 0.85 nominal engine power (no more than 72^0 on the UPRT [Fuel Flow Control Indicator]) the duration of engine operation at this setting is not limited.

At flight speed at nominal engine power (84^0 +/- 2^0on the UPRT) is permitted for use in special flight circumstances at the discretion of the aircraft commander (icing, extreme hot weather)

4. All data in Table 3 corresponds to flight conditions at standard outside air temperature and normal engine adjustment. If the temperature deviates from standard:

   - In modes 1 and 2: maintain the target airspeed from Table 3 by adjusting the engine power setting, but do not exceed 74^0 UPRT.
   - In modes 3 and 4: maintain the engine power setting specified in Table 3, provided the indicated airspeed remains within 360–510 km/h.
   - During level flight at 0.85 nominal power or lower, the exhaust gas temperature (EGT) behind the turbine must not exceed:
   - Up to 8,000 m: 450^0
   - 8,000 m and above: 470^0

     For every +/- 1 C^0 deviation from standard ambient air temperature, the allowable EGT changes by +/- 1 C^0 respectively. If an engine's temperature exceeds these limits after reaching altitude, reduce the power setting until the temperature stabilizes within the allowed range.

In level flight with autopilot engaged, its operation must be continuously monitored via flight instruments and the deflection of control surfaces.

5. Recommended flight levels.

   For flight distances up to 500 km total length, the flight levels according to **Table 4** are recommended

TOTAL DISTANCE	100-199	200-299	300-399	400-499
Recommended flight level	130/140	200/210	230/240	250/260

   For flight above 500 km distance the following flight levels are recommended, see **Table 4a**.

FLIGHT MASS (t)	41	43	45	47	49	51	53	55	57	59	61	63
INA	330				310	300	290	280	270	260	250	240
INA + 10ºC	330	310		290		280	270	260	250	240	230	220
INA + 20ºC	310		300	280	270	260	250	240	220	210	200	190

VII DESCEND

1. Before commencing the descent, the navigator calculates the descent start time, in accordance with the controller's instructions regarding the airfield approach altitude, and reports this time to the aircraft commander.

The engine operating mode during descent must be adjusted below 72º to according to the UPRT (Fuel Lever Position Indicator).

Descent is recommended to be carried out in accordance with the data in Table 5.

Table 5

DESCEND PARAMETERS					
Descend from altitude (m)	Vertical speed (m/s)	Indicated air speed (km/h)	Time required (min)	Distance (km)	Fuel required (kg)
10100	10	370	20	169	570
9600	10	370	19	159	550
9100	10	370	18	149	525
8600	10	451	17,5	139	503
8100	10	487	16,5	130	480
7800	10	497	15,5	123	465
7500	10	503	15	117	450
7200	10	509	14,5	112	439
6900	10	510	14	106	425
6600	10	510	13,5	100	412
6300	10	510	13	96	400
6000	10	510	11,5	90	385
5000	10	510	10	72	345
4000	10	510	8	54	305
3000	10	500	6,5	37	265
2000	10	500	4,5	21	225
Transition	10	≥450	4	6	180
Pattern	10	≥450	4	0	155

2. In all cases, perform the descent from the flight level—including maneuvering in the aerodrome area at altitudes above the circuit height—without exceeding an indicated airspeed of 510 km/h and a Mach number of M=0.65 at altitudes above 7000 m." To maintain safe descending airspeed, it is permitted to use the flaps from 5-10^0 below V_{IAS} 450 km/h if necessary.

When maneuvering, take into account the following data:

a) The amount of altitude loss when recovering the aircraft to level flight:

b) The distance required to reduce aircraft speed by 100 km/h in level flight, with the throttle levers moved to the Flight Idle position, is approximately 5 km at altitudes from 3,000 m down to the traffic pattern altitude.

3. When descending at a constant vertical speed of 10 m/s, the pressure change in the passenger cabin should correspond to a descent rate of 2 – 3 m/s on the cabin vertical speed indicator (variometer). Exceeding these limits is a sign of a malfunction in the automatic cabin pressure regulator.
4. During descent, it is permitted to set the inboard engines to the 0° position on the UPRT (thrust lever angle indicator) down to an altitude of no less than 1,000 m, provided that the previously specified speeds are not exceeded.

WARNING: During descend from an altitude of 1000m and during landing approach until flare/hold-off altitude (no more than 1m above the runway), moving the throttle levers from "Flight Idle" position (16^0 UPRT) to the "Ground Idle" position (0^0 UPRT) is prohibited

5. When descending with the thrust levers set to 0^0 according to the UPRT (Thrust Lever Position Indicator), the KFL-37 (red lamps on the manual feathering levers) lamps of the inner engines may light up. In this case, it is necessary to move the inner engines' thrust levers to a higher setting until the lamps go out, but no lower than the flight idle gate (no lower than the flight idle setting of 16^0 on the UPRT).

   If the KFL-37 lamps go out (the power plants are healthy), you may continue the descent at the established engine operating mode. If the KFL-37 lamp for one of the inner engines does not go out, it is necessary to feather the propeller of that engine and descend on three engines.

6. Descent is performed according to the descent and approach pattern established for the given airfield. Before descending, it is necessary to turn on the radio altimeter (RV). Set the signaled altitude selector to the traffic pattern altitude value.

If the traffic pattern altitude is higher than the maximum altitude that can be set on the selector, set it to the maximum possible altitude value.

7. Upon receiving clearance to descend for landing, the barometric altimeter scales setting from a setting of 760 mm Hg (1013 mbar) to a reading corresponding to the atmospheric pressure at the landing airfield. This should be done in level flight at the transition level. Before setting the airfield pressure on the altimeters provided by the approach controller, the aircraft commander compares the landing airfield pressure with the pressure specified in previous weather information available to the crew. The aircraft commander is the first to set the landing airfield pressure on the altimeters, followed by the co-pilot and navigator under his supervision. The flight engineer compares the set landing airfield pressure and the altitude values on the altimeters and reports to the aircraft commander.

8. At the traffic pattern altitude, set the radio altimeter signaled altitude selector:

   - To the DH (Decision Height), if it is no more than 60 m;

- To a height of 60 m, if the DH is more than 60 m. After entering the glide slope, it is necessary to turn off the air conditioning system.

9. For optimal descend operation, see Table 6 and Table 6a below.

Table 6

FUEL EFFICIENT DESCEND AT 72º>UPRT>16º MACH 0.55 OR IAS 460 KM/H				
H		DESCEND FROM AN ALTITUDE TO 400M		
FL	METER	MINUTES	KILOMETERS	FUEL (KG)
330	10050	21,7	202	573
310	9450	20,6	191	546
290	8850	19,5	180	520
270	8250	18,4	169	494
250	7600	17,3	157	467
230	7000	16,2	146	441
210	6400	15,1	135	414
190	5800	14,0	123	388
170	5200	12,9	112	362
150	4550	11,5	98	328
130	3950	10,1	85	294
110	3350	8,7	72	261
90	2750	7,3	59	227
70	2150	5,9	47	194
50	1500	4,5	35	160

Table 6a

TIME EFFICIENT DESCEND AT 72º>UPRT>16º MACH 0.60 OR IAS 480 KM/H				
H		DESCEND FROM AN ALTITUDE TO 400M		
FL	METER	MINUTES	KILOMETERS	FUEL (KG)
330	10050	18,3	176	511
310	9450	17,4	167	488
290	8850	16,5	157	465
270	8250	15,6	147	442
250	7600	14,7	137	419
230	7000	13,9	126	396
210	6400	12,9	116	373
190	5800	12,0	107	351
170	5200	11,1	97	329
150	4550	10,0	85	300
130	3950	8,9	75	272
110	3350	7,8	65	244
90	2750	6,7	55	216
70	2150	5,6	45	189
50	1500	4,5	35	160

VIII. APPROACH AND LANDING

1. Upon reaching the rectangular pattern altitude, gradually reduce speed to 350 km/h. After passing the Outer Marker and before starting the third turn, extend the landing gear.

   Note: To save fuel, it is permitted to extend the landing gear between the third and fourth turns before extending the flaps to 15º, and when approaching via the shortest path—at a distance of no less than 18 km. In this case, the completion of the check according to the Checklist, section "Before the third turn," is the flight engineer's report on the completion of the landing gear extension.

2. Execute the third turn at a speed of no more than 320 km/h and extend the flaps to 15º.

   Note: At airfields where a landing pattern with a bank angle of 25º is implemented, extend the flaps to 15º after extending the landing gear before the third turn, at a speed of no more than 320 km/h. Execute the third turn with a bank angle of 25º at a speed of 300-320 km/h in manual control mode or from the "Turn" knob. If the "Turn" knob does not provide a bank angle of 25º, disconnect the autopilot using the KBO button and execute the turn in manual control mode.

3. After the fourth turn, before entering the glide slope at a speed of no more than 300 km/h, further extend the flaps to 30º and open the cover of the emergency feathering switch. After extending the flaps to 30º, smoothly reduce flight speed to the recommended descent speed according to Table 5, depending on the flight weight. Maintain the specified speeds during glide slope flight until the start of the flare. When flying in turbulence and other conditions that worsen aircraft controllability, the descent speed should be increased by 10-15 km/h. Pass the Inner Marker at the altitude established for the given airfield.

4. During descent, it should be kept in mind that within the speed range up to 360 km/h at actual ambient air temperatures, propeller thrust close to zero is achieved at the following throttle lever positions according to the fuel lever position indicator (UPRT) (Table 7):

Table 7

UPRT SETTINGS ACCORDING TO OAT	
Outside air temperature (ºC)	Throttle position according to UPRT gauge (degree)
+50 to +35	20
+34 to -5	16
+6 to -20	20
-21 to -30	23
-31 to -50	26
-41 to -50	29
-51 to -60	32

After the fourth turn until the start of flare, it is forbidden to set the thrust levers (throttle) to angles smaller than those specified above, as this causes negative thrust.

WARNINGS:

1. In individual cases during the landing approach, especially in conditions of low outside air temperatures and with low fuel flow adjustment on the engines, the KFL-37 warning light may illuminate. This indicates the occurrence of 1200 kg of negative thrust on a normally operating engine (engines).
2. If, when the KFL=37 light (lights) illuminates, no significant rolling or yawing moments occur and the instrument readings for that engine remain normal, then the illumination indicates not an engine failure, but the occurrence of 1200 kg of negative thrust. In this case, it is necessary to increase the engine (engines) power setting until the KFL-37 light goes out (such negative thrust is not required for the aircraft for flight along the glide path) and continue to perform a normal landing approach.
3. Before starting the flare, set the thrust levers of all engines to the position corresponding to zero thrust
4. Begin the flare at a height of 10–8 m.
5. Perform the landing with a slightly raised nose gear. The touchdown speed should be approximately 30 km/h less than the glide path descent speed (Table 5).
6. After touchdown, move the throttle levers to the Ground Idle position.
7. Lower the nose landing gear and engage its steering. During the rollout, after the propellers are taken off the flight fine-pitch stop, the KFL-37 lamp should illuminate.
8. Once the propellers are off the stop, the use of wheel brakes is permitted.
9. At the end of the rollout, when aircraft speed is reduced, retract the flaps, shut down the outboard engines, and lock the landing gear retraction button safety pin.
10. When landing - especially with low landing weights - at airfields with limited runway length (less than 2000 m), restricted approaches, or outside air temperatures at airfield level between 0 ºC and 30 ºC, it is permitted to set the throttle levers of the two inboard engines to the "Ground Idle" position (0^{o} on the UPRT [propeller pitch indicator]) only during the flare at a height of no more than 1 m above the runway to shorten the landing distance. Counteract the aircraft's tendency to drop its nose by smoothly pulling the yoke back to ensure touchdown occurs with a slightly raised nose landing gear. Do not allow the throttle

levers to be moved above 30º on the UPRT after landing and the removal of propellers from the stop when the KFL-37 warning lights are on (negative thrust of 1200 kg or more).

11. After landing, turn off the flight recorder, the pitot probe heaters, and the cockpit window heaters.

IX. LANDING WITH OVER MAXIMUM ALLOWABLE LANDING WEIGHT, CROSSWIND, HEADWIND, TAILWIND

1. In exceptional cases, individual landings of an aircraft with a weight greater than the maximum landing weight (up to the maximum takeoff weight) are permitted, provided there is a soft touchdown and increased pilot attention.

Warning: In all cases of landing an aircraft with a weight above the maximum landing weight or with a fuel residue of more than 10 tons, an inspection is carried out in accordance with the maintenance regulations, and the crew is obliged to record such landings in the certificate of operation of the material part.

2. Descent during the landing approach with a weight exceeding the maximum allowable landing weight, from the entry into the glide path to the runway threshold, should be performed at a constant speed according to the chart shown in Table 5, depending on the landing weight of the aircraft. When flying in turbulence and in other conditions that degrade the aircraft's controllability, the descent speed should be 10–15 km/h higher than when landing under normal conditions.

Landing in a crosswind

1. During the landing approach with a crosswind, drift should be compensated for only by the crab angle (crab method). Immediately before touchdown, deflect the rudder pedals toward the drift, aligning the aircraft with the runway axis.

2. The pre-landing descent and touchdown speed must be 10 km/h higher than when landing under normal conditions.

3. Immediately after touchdown, smoothly lower the nose landing gear and enable its steering.

4. Take the propellers off the stop and begin wheel braking, using the nose gear steering to maintain direction throughout the entire landing roll.

5. The maximum allowable crosswind speed (at a 90° angle to the runway) is no more than 15 m/s.

Landing with headwind and tailwind

1. Landing is permitted with a headwind of up to 25 m/s.

X. GO-AROUND

1. With a headwind at the airfield of more than 15 m/s, after completing the rollout, lock the controls and taxi to the parking area with locked controls.
2. The final approach descent speed when landing with a headwind should be increased:

   with wind 10-15 m/s — by 10 km/h

   with wind 15-25 m/s — by 20 km/h.
3. Landing with a tailwind of up to 5 m/s is permitted.
4. When landing with a tailwind, do not relax pressure on the rudder pedals at the end of the rollout to avoid rudder shimmy.
5. When approaching for landing along a rectangular pattern, a significant amount of drift from the beginning of the third turn until reaching the straight-in should be taken into account.

6. Perform the landing in accordance with the recommendations.
7. The minimum go-around altitude with all engines operating, landing gear extended, and flaps deflected at 30º, at all landing weights, is 10 m.

   At high outside air temperatures (above + 30 Cº), the minimum safe go-around altitude is 25m.
8. Having made the decision to go around, the aircraft commander is obliged to:
   - immediately set the engines to takeoff power and warn the crew about the go-around.
   - bring the aircraft out of the descent, maintaining a constant speed until the aircraft transitions to a climb and maintaining the calculated landing heading; if necessary (for example, with an increased vertical descent rate), to reduce sink, it is permissible immediately after applying power to smoothly reduce the speed to a speed that is 10 km/h less than the recommended glide slope descent speed.

Note. It should be kept in mind that to reduce the speed, the control column should be pulled "back" only to half of the desired reduction, since after releasing the control wheel, the speed additionally decreases by the same amount;

- Maintain the reduced speed only until the aircraft transitions to a climb;
- After the aircraft transitions to a climb and the engines reach takeoff power, retract the landing gear and gradually increase speed; at a speed of at least V_2 (safe takeoff speed with flaps extended to 15°), retract the flaps to 15° in increments.

XI. TAXIING TO THE PARKING STAND AND ENGINE SHUTDOWN

1. Before taxiing to the parking stand, ensure the brakes are operating normally and that there is pressure in the hydraulic accumulators (225-148 kg/cm^2).
2. If taxiing to the parking spot is difficult, stop the aircraft 50 m before the parking stand and shut down the engines. Tow the aircraft to the parking spot using a tractor.
3. After taxiing to the parking spot and stopping the aircraft:
   - Close the emergency feathering cover;
   - Engage the parking brake;
   - Lock the aircraft controls;
   - Turn off power to unused electrical consumers;
   - Set the "AGD-1 Power" switch to the "Main" position, having first flipped back the safety cap;
   - Disconnect the AC generators of all four engines and the DC generators of the first, third, and fourth engines if taxiing to parking was performed on four engines; or the DC generators of the third engine if taxiing was performed on two engines;
   - Stop the two outboard engines (if taxiing was performed on all engines) by setting the stop switches to the "Stop" position, and close their fire cocks;
   - Stop the third engine;
   - Set the voltmeter rotary switch "Voltage of left/right sources" to the "Central Distribution Bushing" position and check the battery voltage; if the voltage is not lower than 24 V, disconnect the DC generators of the second engine and, after ensuring the batteries are connected to the onboard network, stop the second engine with the "Stop" switch and close its fire cock.

Note: If, when disconnecting the generators of the last running engine, there is no voltage in the onboard network, it is necessary to connect the generators to the network, ensure the network voltage is 28–29 V, and then stop the second engine using the fire cock;

- After the propellers stop, de-energize all systems except for the lighting system, and also disconnect the storage batteries and all consumer power switches and circuit breakers (AZS);
- Set the "Aerodrome — Off — Onboard" switch to the "Off" position.

Note. If, during aircraft taxiing, engine operating modes above 32º on the UPRT (Throttle Position Indicator) were used, then before shutting down these engines, it is necessary to cool them for 2–3 minutes in the "Ground Idle" mode.

XII. NIGHT FLIGHTS

1. Taxiing shall be performed with taxiing lights, ANO (Navigation Lights), and the beacon switched on. It is permitted to switch on landing lights during taxiing, but the duration of their continuous operation must not exceed 5 minutes. If necessary for prolonged illumination with landing lights, alternately turn on the wing and fuselage lights. Before taxiing, ensure the brightness of the failure annunciator panel is adjusted.

2. Takeoff is performed the same as during the day, but generally with landing lights on. At an altitude of 50–60 m, turn off and retract the lights.

3. Flight along a rectangular pattern is performed the same as during the day. Bank angles during turns should be 15–20°.

4. Landing approaches are performed the same as during the day. Extend landing lights after the fourth turn and turn them on during the final approach at an altitude of 90–100 m.

5. When approaching for landing in conditions of limited visibility, such as fog or precipitation, the lights are used at the discretion of the aircraft commander.

6. Landing lights are typically activated once visual contact with the runway or ground is established.

7. If the use of landing lights creates a glare or an interfering light screen that obstructs vision, they should be switched off.

8. The landing procedure follows the same general steps as those performed during daylight hours.

9. For night operations, using oxygen for a short duration before takeoff can be helpful for maintaining alertness and well-being.

10. Before a night takeoff, it is important to verify the functionality of the primary and standby attitude indicators while at the lineup position. Ensure all backup instruments are receiving power and are operating within normal parameters.

During the initial climb and throughout all turns, monitoring the attitude indicators is essential. If any discrepancies or sharp changes in pitch readings are observed during a turn, it may indicate a technical issue. In such instances, transitioning to the standby attitude indicator and other backup instruments is the standard procedure for maintaining situational awareness.

XIII. PERFORMANCE CHARTS

1. Permissible takeoff weights - Table 8

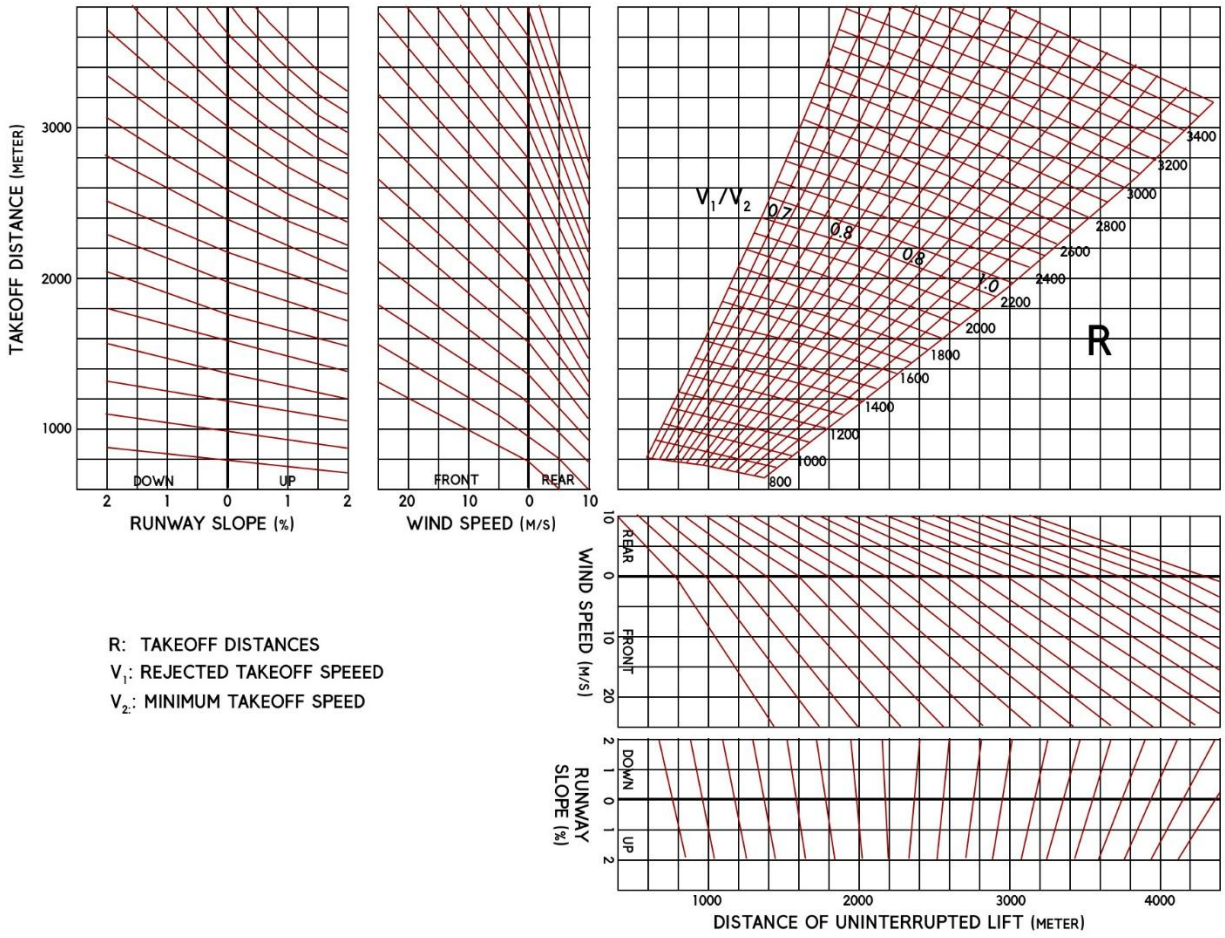
OAT (C°)	PERMISSIBLE TAKEOFF WEIGHT (T) FLAPS AT 15°; LANDING GEAR RETRACTED; H<1000 M																				
	SITE ELEVATION (M)																				
	0	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
20																					64,4
21																				64,3	64,0
22																			64,1	63,9	63,7
23																		64,1	63,8	63,6	63,3
24																	63,9	63,7	63,4	63,2	63,0
25											64,9	64,7	64,5	64,3	64,1	63,9	63,6	63,4	63,1	62,9	62,6
26										64,9	64,6	64,4	64,2	63,9	63,7	63,5	63,3	63,0	62.8	62.5	62.3
27									64.7	64.5	64.2	64.0	63,8	63,6	63,4	63,2	63,0	62,7	62,5	62,2	62,0
28								64,6	64,4	64,2	63,9	63,7	63,5	63,2	63,0	62,8	62,6	62,3	62,1	61,8	61,6
29							64,4	64,2	64,0	63,8	63,5	63,3	63,1	62,9	62,7	62,5	62,3	62,0	61,8	61,5	61,3
30						64,2	64,0	63,8	63,6	63,4	63,2	63,0	62.8	62.5	62.3	62.1	61.9	61.7	61.4	61.2	61.0
31					64,2	63,8	63,6	63,4	63,2	63,0	62,8	62,6	62,4	62,1	61,9	61,7	61,5	61,3	61,0	60,8	60,6
32		64,2	64,0	64,0	63,8	63,4	63,2	63,0	62,8	62,6	62,4	62,2	62,0	61,7	61,5	61,3	61,1	60,9	60,6	60,4	60,2
33	64,0	63,8	63,6	63,5	63,3	63,1	62,9	62,7	62,5	62,3	62,1	61,9	61,6	61,4	61,2	61,0	60.8	60.5	60.3	60.0	59,8
34	63,6	63,4	63,2	63,1	62,9	62,7	62,5	62,3	62,1	61,9	61,7	61,5	61,3	61,0	60,8	60,6	60,4	60,1	59,9	59,6	59,4
35	63,2	63,0	62,8	62,7	62,5	62,3	62,1	61,9	61,7	61,5	61,3	61,1	60,8	60,6	60,4	60,2	60,0	59,7	59,5	59,2	59,0
36	62,8	62,6	62,4	62,3	62,1	61,9	61,7	61,5	61,3	61,1	60,9	60,7	60,5	60,2	60,0	59,8	59,6	59,3	59,1	58,8	
37	62,4	62,2	62,0	61,9	61,7	61,5	61,3	61,1	60,9	60,7	60,5	60,3	60,0	59,8	59,5	59,3	59,2	58,9	58,7		
38	62,0	61,8	61,6	61,4	61,2	61,0	60,8	60,6	60,4	60,2	60,0	59,8	59,6	59,3	59,1	58,9	58,9	58,5			
39	61,6	61,4	61,2	61,0	60,8	60,6	60,4	60,2	60,0	59,8	59,6	59,4	59,1	58,9	58,6	58,5	58,5				
40	61,2	61,0	60.8	60.6	60.4	60.2	60.0	59,8	59,6	59,4	59,2	59,0	58,7	58,5	58,2	58,0					
41	60,7	60,5	60,3	60,2	60,0	59,8															
42	60,1	60,0	59,8	59,7	59,5	59,4															
43	59,6	59,5	59,3	59,2	59,0	58,9															
44	59,1	58,9	58,8	58,7	58,6	58,5															
45	58,6																				

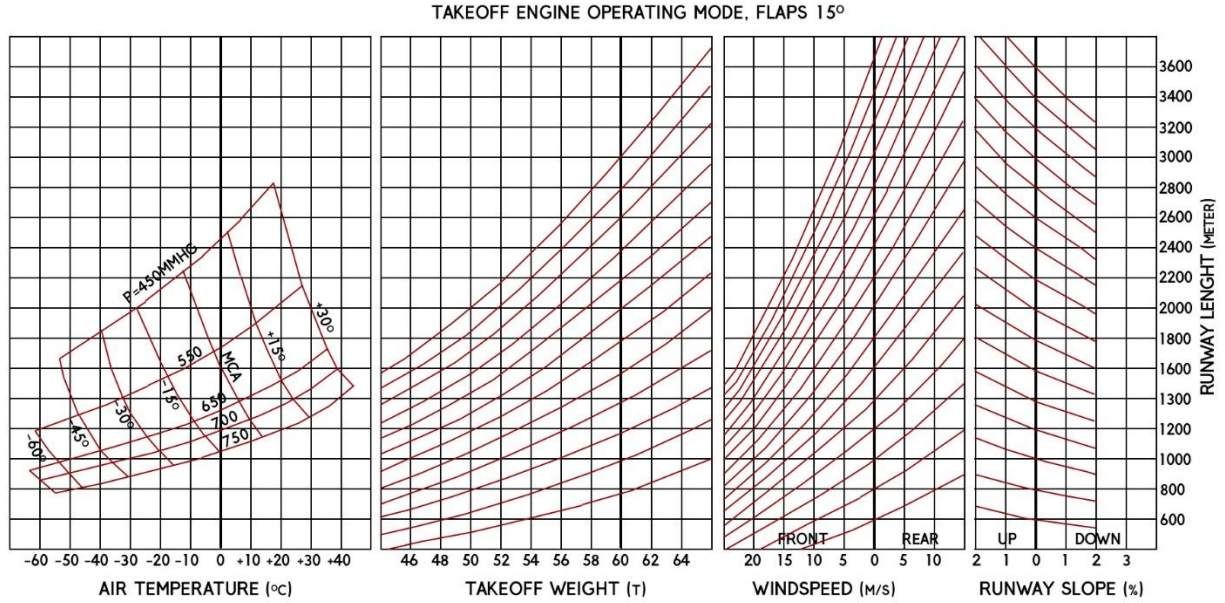
ELEVATION 1000<H<2000 M: SUBTRACT 1,5T
ELEVATION 2000<H<2500 M: SUBTRACT 1,9T

2. Cruise operating modes – Table 8

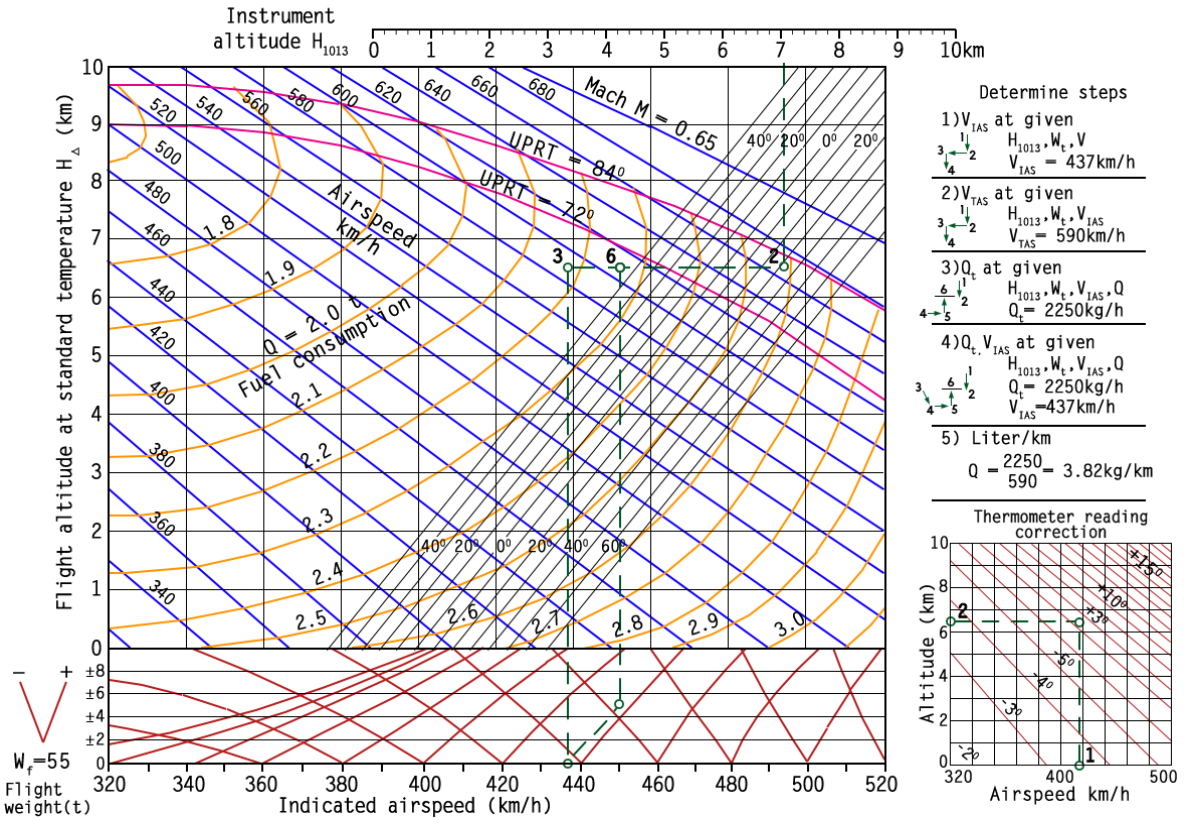
		OPERATING MODE											
		Maximum speed range				Cruise flight 72 UPRT				Cruise flight 84 UPRT			
Flight mass (t)	Flight alt. (km)	IAS (km/h)	TAS (km/h)	Relative range (km/kg)	Fuel flow (kg/h)	IAS (km/h)	TAS (km/h)	Relative range (km/kg)	Fuel flow (kg/h)	IAS (km/h)	TAS (km/h)	Relative range (km/kg)	Fuel flow (kg/h)
62,5	7,8	410	605	0,284	2132	394	577	0,283	2040	437	638	0,280	2278
	7,2	423	600	0,277	2163	425	602	0,277	2171	461	651	0,269	2418
	6,6	430	592	0,269	2198	450	616	0,268	2300	481	658	0,257	2561
	6,0	440	582	0,261	2233	470	623	0,256	2433	501	664	0,245	2705
60	8,4	396	605	0,299	2025	373	566	0,295	1918	421	636	0,295	2153
	7,8	407	600	0,293	2050	410	600	0,292	2052	444	648	0,284	2281
	7,2	419	594	0,284	2090	435	616	0,283	2176	466	658	0,272	2421
	6,6	426	586	0,276	2123	457	626	0,272	2304	485	663	0,259	2558
	6,0	434	577	0,265	2175	476	632	0,259	2437	506	669	0,247	2707
57,5	8,4	394	600	0,308	1945	394	597	0,309	1933	430	649	0,301	2157
	7,8	403	595	0,302	1970	421	617	0,300	2060	450	657	0,288	2283
	7,2	414	587	0,292	2007	444	628	0,288	2180	470	663	0,274	2423
	6,6	422	580	0,283	2050	463	633	0,274	2307	489	668	0,261	2560
	6,0	430	572	0,270	2120	479	636	0,261	2438	508	671	0,248	2708
55	9,0	382	599	0,326	1832	380	596	0,326	1830	414	646	0,318	2032
	8,4	390	594	0,319	1862	407	616	0,317	1942	437	658	0,305	2160
	7,8	400	590	0,311	1897	430	628	0,304	2063	455	663	0,290	2286
	7,2	410	581	0,300	1937	449	635	0,291	2183	474	668	0,276	2424
	6,6	417	572	0,289	1980	467	639	0,277	2310	492	672	0,262	2561
	6,0	427	567	0,274	2067	485	642	0,256	2440	509	674	0,251	2685
52,5	9,0	378	593	0,339	1750	395	617	0,336	1836	422	657	0,323	2035
	8,4	386	589	0,331	1782	417	629	0,323	1947	442	665	0,308	2162
	7,8	396	584	0,320	1827	436	637	0,308	2067	458	668	0,292	2288
	7,2	404	575	0,307	1870	454	642	0,294	2184	476	671	0,276	2431
	6,6	413	567	0,294	1927	471	644	0,279	2311	494	675	0,263	2562
	6,0	423	563	0,278	2025	486	645	0,264	2442	510	676	0,249	2711
50	10,0	359	597	0,363	1645	344	589	0,361	1633	388	643	0,352	1826
	9,0	373	587	0,351	1670	405	633	0,344	1840	416	664	0,326	2037
	8,4	382	582	0,340	1710	423	639	0,328	1949	446	671	0,311	2160
	7,8	392	577	0,328	1760	431	644	0,311	2070	462	673	0,294	2290
	7,2	398	567	0,315	1800	459	648	0,296	2186	478	674	0,277	2432
	6,6	406	560	0,299	1872	473	648	0,296	2313	498	678	0,265	2563
	6,0	421	560	0,281	1990	490	649	0,266	2443	510	678	0,250	2712
60	3	460	529	0,264	2005	476	547	0,26	2105	507	582	0,252	2310
	4	460	555	0,278	2000	461	556	0,278	2000	489	588	0,267	2200
	5	453	575	0,292	1970	447	565	0,295	1915	470	595	0,282	2110
	6	451	590	0,305	1935	418	557	0,309	1800	455	605	0,302	2005
56	3	457	525	0,272	1930	485	556	0,265	2100	513	588	0,255	2305
	4	451	545	0,288	1890	470	567	0,283	2005	498	600	0,271	2215
	5	442	563	0,306	1840	456	577	0,301	1915	476	603	0,285	2115
	6	433	578	0,32	1805	434	578	0,319	1810	462	616	0,308	2000
52	3	452	520	0,278	1870	490	562	0,268	2100	516	591	0,255	2315
	4	453	537	0,299	1795	477	575	0,287	2005	503	604	0,274	2205
	5	443	551	0,317	1740	463	586	0,306	1915	482	610	0,289	2110
	6	430	565	0,335	1685	443	592	0,327	1810	468	623	0,31	2010
	7	415	588	0,346	1700	408	576	0,349	1650	433	613	0,334	1835
48	3	446	514	0,285	1805	494	567	0,27	2100	520	596	0,258	2310
	4	435	527	0,307	1715	484	582	0,290	2005	506	608	0,276	2200
	5	425	540	0,329	1641	469	594	0,310	1915	487	616	0,292	2110
	6	413	553	0,352	1570	452	602	0,332	1815	474	631	0,314	2010
	7	401	571	0,366	1560	417	593	0,358	1660	443	625	0,339	1845
	8	389	582	0,383	1520	407	577	0,384	1505	412	614	0,367	1675
44	3	441	507	0,296	1715	498	572	0,272	2105	523	599	0,26	2305
	4	438	520	0,316	1645	487	586	0,292	2010	510	613	0,278	2205
	5	424	529	0,342	1545	473	599	0,313	1915	491	621	0,294	2110
	6	408	538	0,368	1460	455	609	0,336	1815	479	636	0,317	2005
	7	389	552	0,39	1415	429	605	0,364	1660	451	634	0,344	1845
	8	377	570	0,46	1240	400	597	0,396	1510	420	627	0,374	1675
40	3	435	501	0,298	1680	501	575	0,275	2090	525	602	0,261	2305
	4	430	512	0,326	1570	491	591	0,295	2005	514	617	0,28	2205
	5	412	517	0,352	1470	478	605	0,316	1915	495	626	0,297	2110
	6	394	524	0,382	1370	462	616	0,34	1810	482	641	0,319	2010
	7	366	527	0,412	1280	430	615	0,37	1660	455	641	0,348	1840
	8	362	547	0,436	1255	409	609	0,404	1510	429	638	0,379	1685

3 Calculating takeoff distance – Table 9

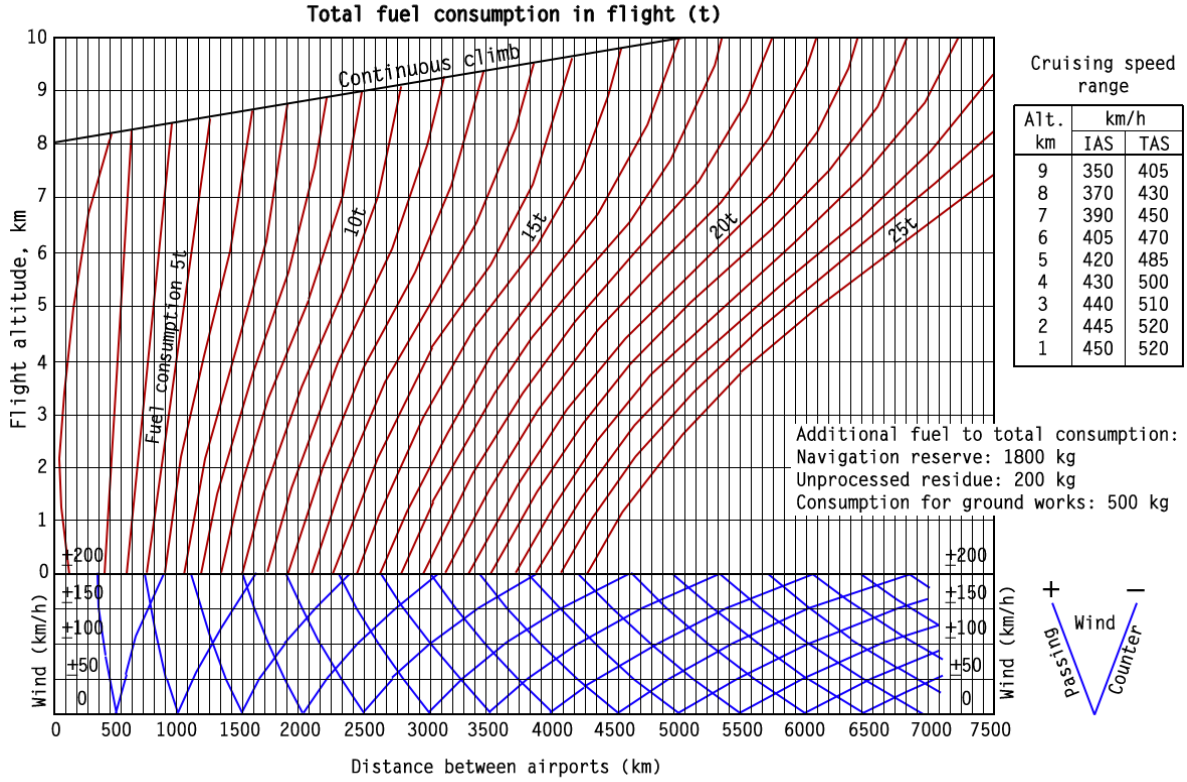




Cruise fuel consumption (t)



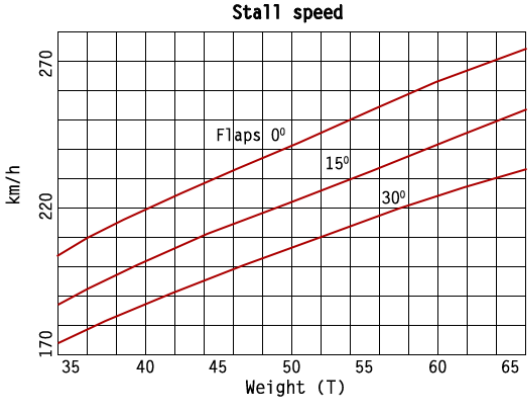
Total fuel consumption in flight (t)

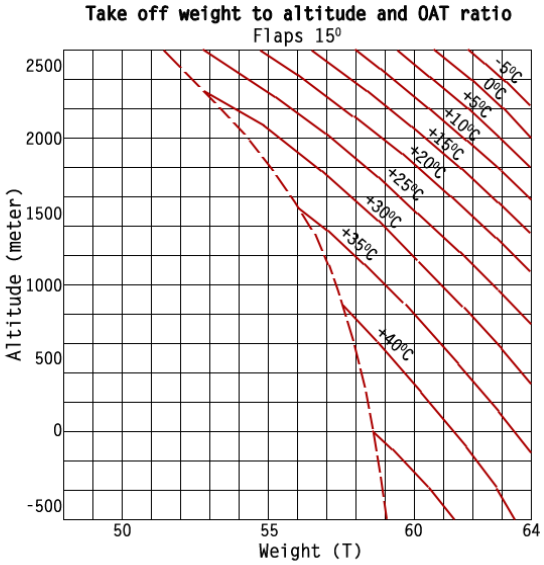


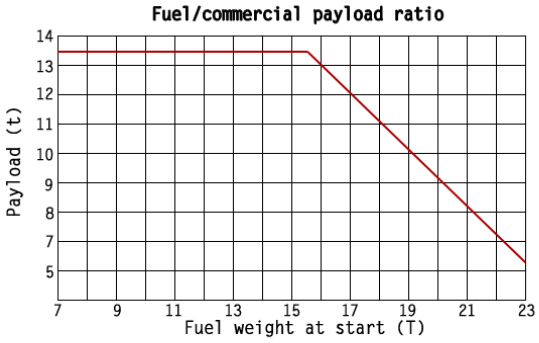
Cruising speed range

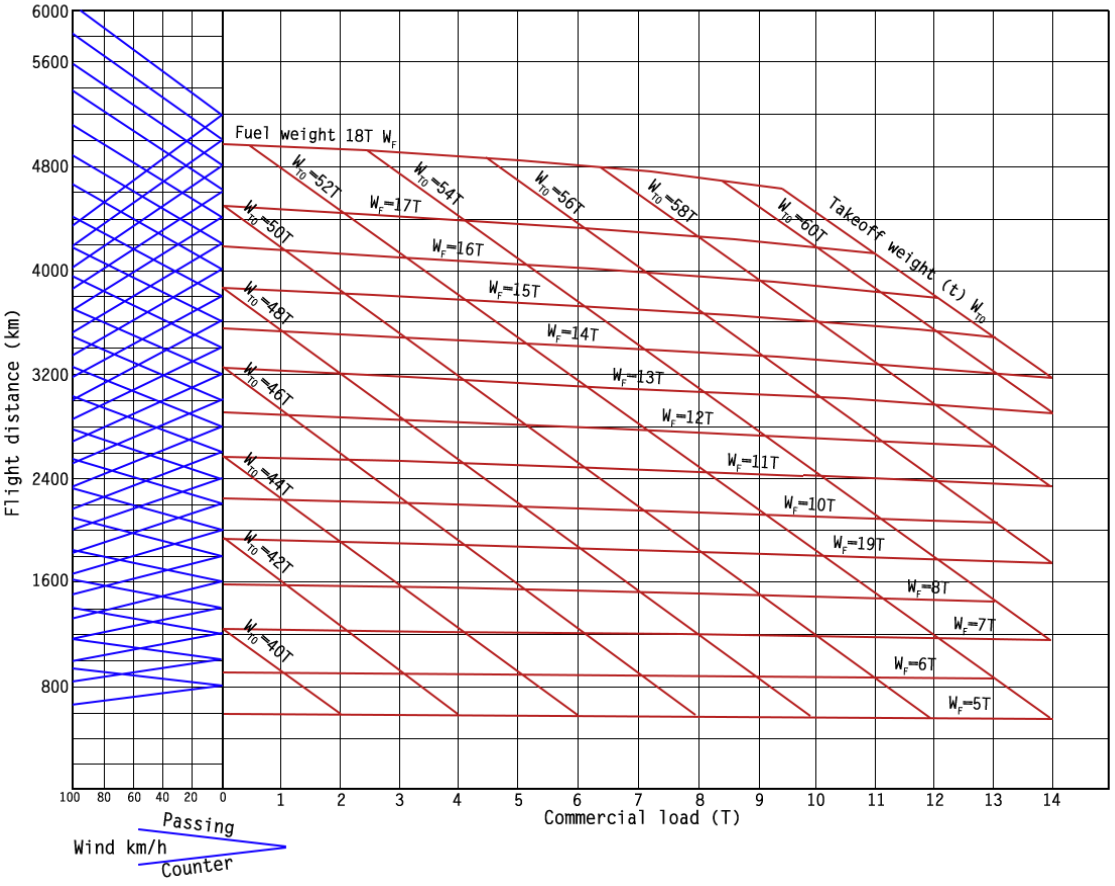
Alt. km	km/h IAS	km/h TAS
9	350	405
8	370	430
7	390	450
6	405	470
5	420	485
4	430	500
3	440	510
2	445	520
1	450	520

Additional fuel to total consumption:
Navigation reserve: 1800 kg
Unprocessed residue: 200 kg
Consumption for ground works: 500 kg


Stall speed
km/h
270
220
170
Flaps 0⁰
15⁰
30⁰
35
40
45
50
55
60
65
Weight (T)


Take off weight to altitude and OAT ratio
Flaps 15⁰
Altitude (meter)
2500
2000
1500
1000
500
0
-500
-5⁰C
0⁰C
+5⁰C
+10⁰C
+15⁰C
+20⁰C
+25⁰C
+30⁰C
+35⁰C
+40⁰C
50
55
60
64
Weight (T)


Fuel/commercial payload ratio
Payload (t)
14
13
12
11
10
9
8
7
5
7
9
11
13
15
17
19
21
23
Fuel weight at start (T)


Flight distance (km)
6000
5600
4800
4000
3200
2400
1600
800
Fuel weight 18T W_F
W_TO=52T
W_TO=54T
W_TO=56T
W_TO=58T
W_TO=60T
Takeoff weight (t) W_TO
W_TO=50T
W_TO=48T
W_TO=46T
W_TO=44T
W_TO=42T
W_TO=40T
W_F=17T
W_F=16T
W_F=15T
W_F=14T
W_F=13T
W_F=12T
W_F=11T
W_F=10T
W_F=9T
W_F=8T
W_F=7T
W_F=6T
W_F=5T
100
80
60
40
20
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Commercial load (T)
Passing
Wind km/h
Counter

XIV. CONTENT OF THE TAKEOFF AND LANDING CONTROL CARDS

I. BEFORE TAKEOFF

(1) Before Engine Start

1. MSRP (Flight Data Recorder), Tape Recorder: ON
2. Doors, Hatches: CLOSED, CHECKED, ALARMS FUNCTIONAL
3. Fuel System — ON, flow meters set, fuel on board confirmed, per calculation
4. Attitude Indicators (AH), Central Gyro Verticals (CGV), Control Units (BKK) — ON, checked, aligned
5. Controls — Checked, free, green lights ON, locking circuit breaker OFF
6. Trimmers — Neutral, green lights ON
7. Identification system — ON, code SET
8. Landing System — ON, frequency ILS SET
9. ADF (ARK) — Tuned: 1st to outer marker, 2nd to inner marker, callsigns heard

(2) During Taxiing

1. Brakes — Checked, serviceable
2. Anti-icers — Inlet Guide Vanes OFF, propellers OFF
3. Engine air intake and propeller anti-icers are ON or OFF depending on weather conditions.
4. Turn-and-Slip Indicator — ON, checked
5. Flaps — Extended 15°

(3) At the Holding Point

1. Altimeters, Radio Altimeter (RV) — Relative height zero, pressure 760 mm Hg, RV ON
2. Auto-feathering by Torque (Intermediate Stop) — Checked
3. 3. Artificial horizons — checked, aligned

(4) At the Holding Point

1. Readiness for takeoff — red signals are off, PPD (Pitot heat) is on, ready.
2. Heading direction coordinated, ready.

II. BEFORE LANDING

(5) Before descent from cruise altitude

1. Charts — reviewed, confirmed.
2. Landing data calculation— fuel volume, Weight, center of gravity %, Landing distance, Approach speed.
3. Radio Altimeter (RV), bug — ON, set to DH.
4. Heading system — coordinated, GPK (Directional Gyro) mode SET, heading direction SET
5. Approach system — ON, ILS frequency SET, channel established
6. Hydraulic system pressure — Normal
7. Pitot heaters (PPD) — check ON.

(6) After switching to airfield pressure

1. Altimeters — Pressure SET (local Hg), left and right altimeter readings are identical
2. ADF (ARK) — Tuned: first to outer marker, second to inner marker, callsigns heard

(7) Before the third turn or at a distance of 18–20 km

1. Landing gear — Extended, green lights on; brake pressure zero; parking brake OFF
2. Nose wheel steering — OFF
3. Radio Altimeter (RV) selector — selected DH Check

(8) Before Intercepting the Glideslope

1. Flaps extended — 30°.
2. Landing lights — Extended

Consideration for the usage of the autopilot during flight operations

1. The AP-6E autopilot may be used after takeoff at altitudes of no less than 400 m.
2. Engaging the AP-6E during climb, level flight, or descent is permitted only in steady flight modes, and in cloudy conditions—only when the natural horizon is visible.
3. If it is necessary to change the flight mode (speed or altitude), and also every 1.5–2 hours of flight, the autopilot should be switched off, the aircraft balanced using the trimmers, and then the autopilot switched back on.
4. Accelerations and decelerations must be performed with the autopilot switched off.
5. Adjusting elevator, rudder, or aileron trimmers while the autopilot is engaged is prohibited.
6. During the landing approach, combined aircraft control is permitted: automatic for the lateral channel, and director mode for the longitudinal channel—down to an altitude of at least 60 m

END OF DOCUMENT

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