

Sukhoi 100 Superjet tutorial LKMT-LIRF (model update 3)

Trip from Ostrava to Rome

Intro

This document is not based on real checklist (because I do not have it and maybe official checklist still does not exist – plane is too new and not in real usage, limits are from plane-maker application or tests).

[NS] ... not simulated

Changes

This version is based on UPDATE 3 version of model. Most important features are GPU and pressurization.

Model

<http://store01.prostores.com/servlet/x-planestore/StoreFront> (\$14.95)

Primary release (54 803 030 bytes)

Update 1 ... VOR, fixes (2 723 193 bytes, patch only)

Update 2 ... added Sochi Olympics livery, some fixes (57 295 065 bytes)

Update 3 ... bleed air fix (57 299 326 bytes)

Route plan

Ostrava Mosnov LKMT – Rome Fiumicino LIRF



You can plan your route on RouteFinder web page.

<http://rfinder.asalink.net/free>

Cruise level FL330

LKMT SID HLV MIKOV STO DENUX PUBEG UMBIL GRZ RADLY ARLON DOL ILB GIRDA BAXON LANLI
VAPIX GUBIN UMBED NIKMA GITOD STAR LIRF

LKMT RWY22 TO HLV:

direct runway heading to HLV

LIRF GITOD TO RWY16L:

GITOD to BOL then 169deg, ILS FLL 108.1 MHz with 161 deg at 2500ft DH 86ft for CATII

Length 556 nm

Alternate airport: Napoli LIRN

LIRF SID LATINA CIRCE PONZA STAR LIRN, route length 135 nm

Alternate airport must be near to target airport, capable to receive our aircraft and must be in distance to be not affected by possible wrong weather (snow storm etc) on target airport.

Navdata requirements

We are flying with real data so in XPL can be missed some waypoints.

Changes can be added to XPL\Resources\Default Data\earth_fix.dat (make backup of original file):

Before 99 on end of file:

All required waypoints are present in default XPL NAVDATA.

No changes needed for this trip.

Keys and Joystick Configuration

We need quick Autopilot Off – for landing phase:

Button FIRE on joystick AUTOPILOT / SERVOS_TOGGLE

We need easy control of SPEEDBRAKES in Approach phase:

Button on joystick FLIGHT_CONTROLS / SPEED_BRAKES_DOWN_ONE

Button on joystick FLIGHT_CONTROLS / SPEED_BRAKES_UP_ONE

You need map BLEED AIR LEFT ON and BLEED AIR RIGHT ON to joystick button (or keyboard) and apply. You can check status with BLEED data variable (Settings, DataInputOutput, Pressurization status).

Passengers and payload



Picture: OpenScenery vehicles are added for effect

Passenger weight for our purpose is 83 kg (183lbs) per male and 68 kg (150 lbs) per female.

Standard baggage is 44 lbs.

Max payload in XPL model is 41168 lbs.

For SSJ 100-95 is maximal count of passengers 98.

For 60 passengers with one baggage each is payload $60 \cdot (183 + 44) = 13620$ lbs

Fuel plan



Picture: OpenScenery vehicles are added for effect

Fuel consumption is about 3750 lbs (1700kg) of fuel per hour. (use 4400 lbs for low flights)

Our cruise speed will be 440 kts.

Used Jet A conversion 6.76 lb / US gallon.

Taxi and APU fuel: destination 250 lbs + target 250 lbs = 500 lbs

Trip fuel: 556 nm / 440 kt * 3750 lbph = 4739 lbs

Contingency fuel: 4739 lbs * 5% = 237 lbs

Alternate destination fuel: 135 nm / 440 nmph * 3750 lbph = 1150 lbs

Reserve fuel: 0.5 h * 3750 lbph = 1875 lbs

Additional fuel: 0 lbs (fuel tankering, airport related complication)

Summary fuel: **8501 lbs**

Note: real calculation is more complicated.

Value FINAL RESERVE is 1875 lbs (=Reserve fuel). If aircraft is on this level, pilot must immediately transmit MAYDAY emergency and with ATC cooperation must go to landing immediately on first acceptable airport with ATC priority (and of course following many questions and problems after landing).

Value MINIMUM FUEL is 3025 lbs (=Reserve+Alternate fuel). If aircraft is on this level, pilot must immediately transmit PANPAN emergency.

Note: values (1700kg per hour) are from real. I am not sure but it looks as model has lower fuel consumption.

Plane location

Ostrava Mosnov, Central Apron, position 2A (for example)

Aircraft, WeightAndFuel, FuelWeight. Payload = 13620 lbs (13677 ix XPL)

Aircraft, WeightAndFuel, FuelWeight. Fuel Total = 8501 lbs (8616 in XPL)

Cockpit safety inspection

Parking brake ON, indicator BRAKE illuminates.

Check records in maintenance book [NS].

Check cockpit emergency equipment [NS].

Check circuit breakers [NS].

Check landing lever down.

Power up

Battery switch ON.

Check voltage on voltmeter, 24V minimal, ampermeter indicates negative value (discharging).

Turn NAV lights on.

Avionics switch ON, you must hear sound of avionics cooling, displays go alive

Supplement switch ON

Check fuel onboard (3447+2585+2585) on center panel, must be the same value as refuel request to ground service.

Ask technician to connect external power cable to aircraft plug [NS]

Switch on GPU, green GPU indicator is illuminated. Aircraft is now powered from external power source.

Ground Power Unit – external vehicle with electric power generator or cable from terminal or other airport building.

Open doors.

External inspection

Check wheels, brakes, lights, engines,... You can use external view if you want, or skip this point.

Preflight settings

Receive ATIS (if available in your simulation). [NS]

Example of LKMT real ATIS message:

```
GOOD MORNING MOSNOV ATIS INFORMATION OSCAR 0531  
ILS DME APPROACH RUNWAY IN USE 22 TRANSITION LEVEL 50 TWY F BTN EXIT 1  
AND EXIT L CLOSED. TWY B CLOSED.  
METAR MOSNOV ISSUED AT 05,30 WIND CALM VISIBILITY CAVOK TEMPERATURE 1  
DEWPOINT MINUS 1 QNH 1025 HECTOPASCALS NOSIG YOU HAVE RECEIVED ATIS  
INFORMATION OSCAR
```

We need to know at least current QNH. This value is also on Weather Menu as Baro Pres At Sea Level, for example 1025 mbar. Remember this value.

Request flight permission from TOWER.[NS]

Turn on transponder to standby mode and set assigned SQUAWK code (1443 for example).

Set altimeter to QNH from ATIS/clearance, use control BAROMETRIC PRESSURE on center panel, current value is visible on pilot main display bellow altitude information.

Simple check is available – elevation of airport LKMT is 844ft / 257m. It means that if use correct QNH setting you must get this altitude on altimeter.

Add flightplan to FMC, after each record press NEXT button:

Tip: you can open existing flight plan from saved file located in “XPL/Output/FMS plans”.

AIRPORT LKMT

NDB HLV

FIX MIKOV

VOR STO

FIX DENUX

FIX PUBEG

FIX UMBIL

VOR GRZ
FIX RADLY
FIX ARLON
VOR DOL
VOR ILB
FIX GIRDA
FIX BAXON
FIX LANLI
FIX VAPIX
FIX GUBIN
FIX UMBED
FIX NIKMA
FIX GITOD
VOR BOL
AIRPORT LIRF

You can save FlightPlan with SAVE button on FMC for future use.

Note: planned route ends on GITOD, then follows STAR (Standard Arrival) route. For this document we will assume, that correct route is direct way to BOL waypoint and then approach and landing with ILS.

Set autopilot heading to rwy heading (here for example 223), mode HDG (green).

Switch on autopilot mode ALT (to green) and set transition altitude (5000ft) .

Switch on autopilot mode VS and set vertical speed to +2000 .

Set speed to 250 (official limit) but do not set mode (!).

Check source of navigation to GPS (positions are NAV1, NAV2, GPS).

Set CABIN ALT to 8000 ft (left side).

This relative altitude will be keep (by pressurization) if aircraft will climb above selected value.

Before start

Check if all required documents are on board [NS].

Close doors.

Turn on NO SMOKING and BELTS signs for cabin.

Check if autopilot is in standby mode.

Check if throttle is off (joystick lever in IDLE position).

Turn beacon light on. This light is indicating, that aircraft is dangerous, with running engines.

Turn off GPU, indicator extinguished.

Ask technician to remove external power cable from aircraft [NS].

Start APU, move switch on head panel to APU position and hold, green APU indicator illuminates.

APU is needed for starting engines - compressed air is required.

On many airports is use of APU strictly limited (reason is noise and exhaust exhalation), this is reason why aircraft was powered with airport based GPU (and not with integrated APU).

Note: APU in model does not consume fuel.

Pushback

Request PUSHBACK if required (for 2A LKMT stand is not required) [NS]

You can use STMA Hangar Door Controls plugins and Push back 20m menu command. As far as I know this plugin is free downloadable for non-STMA customers (I got it with very good commercial STMA planes).

Engine start

Request engine startup permission.[NS]

Check fuel cells valve in ALL position.

Check that generators are off (down).

Switch on both inverters (up), yellow indicators extinguished.

Both engine fuel pumps switch down.

Switch on igniters (up).

Check IDLE switches in up position (related to engine fuel pumps).

Check red engine fuel buttons on central panel in down position.

Press LEFT engine start button and wait, engine will be started, monitor values.

Press RIGHT engine start button and wait, engine will be started, monitor values.

After start

Switch both generators on (up), electrical and bleed energy goes from engines, yellow indicators extinguished.

Stop APU, green indicator extinguished.

Check positive load on ampermeter.

Switch on hydraulic pump HYD ON and check both pressure indicators are in green range.

Switch on pitot heating (down), yellow warning PITOT HEAT extinguished.

Switch on ice detection.

Switch antiice, aoa, inlet, bleed, windshield as required, important is to know current weather, forecast, precipitations and temperature.

Taxiing

Request TAXI. [NS]

ALT ARM, **VERT SPD**, **HDG SEL** (but AP is in standby mode!)

Note: we will take off from runway 22 so we need taxi to holding point of RWY 22.

Turn taxi lights on, lights are located on front gear.

Tip: you can set position of taxi lights with Lights/LandingLightUp and LandingLightDown.

Release parking brake, yellow indicator BRAKE extinguished, add power, aircraft will be move.

Test brakes.

Typical max taxi speed is 25 kts on taxiways, 10 kts on aprons.

Stop on holding point HP of runway (yellow line before runway entry).

Before takeoff



Check that all warning indicators are extinguished.

Request takeoff. [NS]

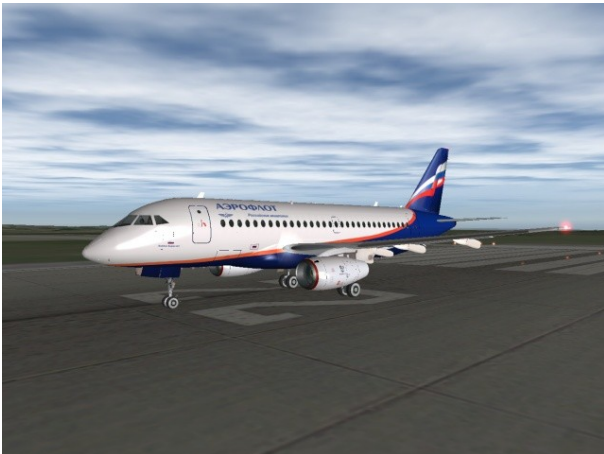
Turn strobe and landing lights on.

Turn taxi lights off.

Turn transponder to TA/RA position.

Enter runway.

Line up.



Autobrake set to RTO (see Rejected takeoff section for reason).

Down FLAPS to 10, check indicator.

Takeoff

Move power levers forward to have N1 set to 90%, monitor engine gauges. Correct value is related to weight, weather (temperature, wind), runway condition (dry, wet) and runway length. Hand stays on throttle lever until V1 for quick reject takeoff if needed.

At 80 kts call "Eighty". Before this point you can/must abort takeoff if any failure occurs.

At V1 = 140 kt (?) call "Vee one". This is takeoff decision speed. Before this point you can abort takeoff if very important failure occurs, after this point you must continue with takeoff. This value is related to runway because here must be remaining runway length to safe stop of aircraft.

At Vr = 150 kt (?) rotate, call "Rotate".

At V2 = 155 kt (?) aircraft must be in air. Safe stop is not possible.

Pitch up with 10-20 degrees.

Note: V-speed are fictional but acceptable, I don't know correct values for this aircraft. Values are also related to weight of aircraft and runway length (V1).

Rejected takeoff

If something goes wrong (engine failure, important warning) and aircraft speed is lower than V1, pilot move throttle lever to IDLE position and (if autobrake is set to RTO) aircraft starts automatically braking with maximal intensity. If V1 speed was computed properly then aircraft will stop before end of runway.

After takeoff

Landing gear up, call “Gear up”.

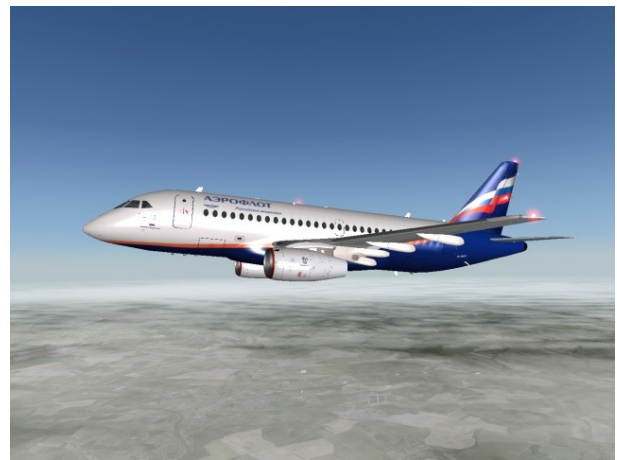
Move flaps up (bellow 220 kts).

Autopilot on – aircraft follows runway heading (HDG) and climbing (VS).

Set AP mode SPD (preset speed is 250 kts, this is typical limit below FL100) to turn on autothrottle, move joystick throttle lever to IDLE position.

Set AP mode APP to navigate by FMS flightplan, HDG mode extinguished.

Check AUTOBRAKE returns to OFF position.



Bleed air to ALL, located on left panel, positions are OFF, FF, ALL, RF, APU.

Some operators (other types) disallows pressurization (PACK) usage before takeoff because PACK decreases performance. So I add this point after takeoff.

At transition altitude:

Set altimeter to QNE 1013 mbar.

Set AP altitude to 33000 (cruise level), turn on VS and set to +2000.

LOC ENG, ALT ARM, VERT SPD, ATHR ENG, APP ENG

At FL100:

Turn landing lights off.

Set speed to MACH and increase AP speed to .78 kts.

Turn off NO SMOKING and BELTS signs

Cruise FL330



AP STATUS: **LOC ENG**, **ATHR ENG**, **APP ENG**

Monitor fuel status, FMC, gauges.

Maximal speed 464 kts (M0.81), normal speed 447 kts (M0.78)

Before descent (before LANLI waypoint)

Where descent? (Current FL minus Target FL) / 3, result in nautical miles

How descent? (Ground speed / 2) * 10, result in fpm

Receive ATIS [NS]

Contact destination airport. [NS]

Descent

On LANLI waypoint:

Typical descent speed is 280 kts, switch to KTS and set AP speed to 280.

Set AP altitude to flight level from ATIS (cca 6000), turn on VS and set to -1800.

Before FL100:

Turn landing light on.

Turn on NO SMOKING and BELTS signs for cabin.

Decrease AP speed to 250 kts.

Turn BLEED AIR OFF

Use speedbrakes if required.

At transition level:

Set altimeter to QNH from ATIS.

For value check ATIS or Weather menu if ATIS not available.

Approach

Before BOL waypoint:

Continue with descent to 4000, turn on VS and set to -1800.

On BOL waypoint:

Set AP HDG to 169 deg and switch to mode HDG (APP mode goes out)
Click AP button SPD to turn autothrottle off and set throttle manually as required.
Set NAV to 108.100 MHz and 161 degrees (ILS frequency for RWY16L).
Set decision height (left panel) to 86 ft (90, CAT-II for C).
Set navigation source to NAV1

On RADAR ALIVE:

Check if your (barometric) altitude are correct and if radar altitude is acceptable for your position.

When 15 nm before airport:

Set AP mode APP on.

On active LOC:

LOC ENG, APP ENG

Check speed bellow 220 kts and flaps down to 10 degrees.

On active GS:

LOC ENG, G/S ENG, APP ENG

Check speed bellow 180 and flaps down to 40 degrees

Gear down, check three green.

Before landing



Picture: cockpit, AP follows localizer and glideslope, gear down, flaps down



Picture: full configuration before landing

Stall speed is 100 KIAS with full flaps down.

Set Autobrake to 1

Position 1 is low, position 3 is high brake efficiency. For long runways are used position 1, for contaminated runways 2. Last position, number 3, is used mostly for emergency. This is recommended by operator (airline).

Check AutoReverse on.

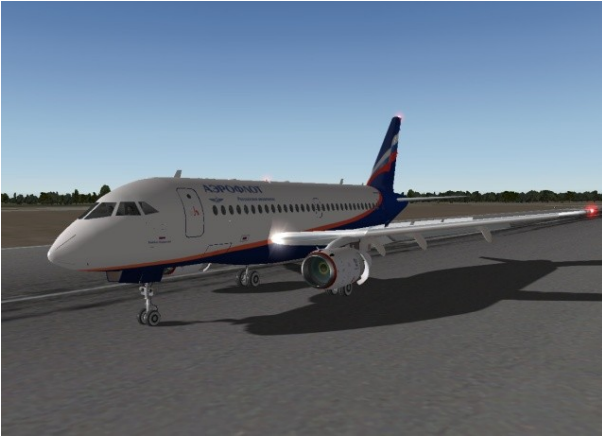
Many airports do not allow (noise) using reverse thrust without emergency reason. Some airports have this limit for night landing only. Reverse thrust spares of brakes.

At Decision Height (you need check radio altimeter or wait for aural information “sto”):

Autopilot OFF

Land manually.

After landing



Picture: After touchdown – full flaps, speed brakes, reverse.

AutoReverse is engaged automatically (if enabled).

AutoBrake is engaged automatically.

Speed brakes are engaged automatically. Speed brakes add almost 60% braking performance.

When speed is 60 kts switch off Reverse Thrust (key PERIOD).

When speed is low and you want disable AutoBrake press and release brake pedal (or V key).

Leaving runway

Leave runway as quick as possible.

Transponder switch off.

Landing and strobe lights turn off.

Taxi light turn on.

Check flaps up.

Speed brakes off.

Contact tower with information where you leave runway and get back instructions how to taxi and where is final stand.

Taxiing

Taxi to stand.

Typical max taxi speed 25 kts on taxiways, 10 kts on aprons.

Shutdown

Activate parking brake.

Taxi light off

Ask to connect external GPU cable [NS]

Turn GPU on.

Pitot Heating, Ice Detect and if used Anti Ice switches off.

Both engines must run for one minute in IDLE mode before shutting down.

Both engine generators switch off, yellow indicators illuminate.

Switch off both fuel pumps, engines will be stopped.

Turn beacon light off.

Turn hydraulics off.

Turn off NO SMOKING and BELTS signs for cabin.

Open doors.

Inverters off.

SUPP off.

AVIONICS switch off.

NAV lights off.

Write remaining fuel quantity.

When landed at destination, you must have at least alternate + reserve fuel or you will have problem with air safety authorities.

BATTERY off.

Leaving the plane

Leave plane and close door.

The End