Virtavia

Yakovlev Yak-52

for MSFS

USER MANUAL

Introduction

The Yakovlev 52 Russian military trainer is capable of awesome aerobatics with its sturdy construction and 360 hp, 9 cylinder radial engine. With a roll rate in excess of 120 degrees per second and its impressive vertical performance the aircraft effortlessly completes advanced aerobatic manoeuvres. The aircraft is equally at home completing gentle turns and dives with the canopy open for a more leisurely flight. The Yak is used in Eastern European countries for basic through to advanced military flying training. The aircraft were built under licence from Yakovlev by the Romanian aircraft manufacturer, Aerostar. Over 1800 have been produced to date starting from 1979.

Support

Should you experience difficulties or require extra information about the Virtavia Yak-52, please e-mail our technical support at
tech.support@virtavia.com

Copyright Information

Exterior Model

<u>About this model</u>

This model is a conversion to MSFS of the FSX version released in 2009, now with improvements and additions for MSFS users.

This new MSFS version differs from the FSX version as follows :

'3D' modelled gauges
Cockpit glass rain fx
Better cockpit glass distressing
New engine sounds
Switch/lever/knob sounds added
Various graphics improvements in the cockpit
Improved bump mapping

The exterior model has all the usual animations such as cowl flaps, oil cooler flap, ailerons, elevators, landing gear and landing flaps.

Quick Start

Starting from cold – Assuming the aircraft was left in the fully shut down state and all switches and levers are in their usual OFF position, then follow the quick start procedure below or alternatively follow the provided .PDF checklist (in the Yak-52's Documentation folder).

Take-Off - a large radial engine with a very light airframe means that getting airborne in the Yak-52 is not a 'go to full throttle and pull back the stick' affair. Practice will be required.

The little Yak's take-off run is unsurprisingly quite short. The amount of payload has little effect on take-off with this aircraft, getting airborne is quite easy. However it is necessary to apply a few degrees of nose-up pitch and set flaps to 1 notch (15 degrees). The provided Runway.flt file ensurs that one notch of flaps is pre-set when you start MSFS on a runway. Release the parking brake (mounted on the control column) and advance the throttle gently to no more than 50% initially. Sudden input or going to full thottle will cause the aircraft to pull hard to the right, due to the gyro forces from the propeller. So be very careful with a) throttle input and b) rudder/nosewheel input, too much of either can cause you to depart the runway ! Once 50 km/h is shown, gradually increase throttle to 75%. Rotate at 120 km/h, stay at 75% throttle, concentrate on staying straight, then apply back stick pressure to get off the ground. Avoid the temptation to go to full throttle before getting airborne, the aircraft will lift off at 75% just fine. Once positive climb is achieved, raise the gear and flaps and dial out the nose-down pitch trim which was put in earlier, failure to do this will cause unwanted pitch-up. Only once the aircraft is airborne and pitch trim is stable is it safe to apply 100% throttle and begin to climb out. The Yak is a challenge to get off the ground but satisfying once it is mastered. Some right wing down trim is already built-in using a value in the Runway.flt file which helps to keep the wings level, although hands-free flight is rarely achievable on such a lively aircraft.

Autopilot

The Yak-52 does not have an autopilot

Approach & Landing –

Landing the Yak-52 is much easier than taking off.

Approach : The aircraft has no speedbrakes so merely throttling back will allow the considerable frontal drag to slow the aircraft down. Reduce speed until 150 km/h is reached and you can enter the pattern.

Final : Slow to 120 km/h and lower the undercarriage. At 90 km/h extend the flaps fully. Maintain a steady rate of descent of around 300 ft/min is achieved and speed is 80 km/h.

Landing : When the runway threshold is visible, hold speed at 80 kts. Once over the runway at 10-20 ft, cut throttles and pull the control yoke back to bleed off speed to 75 km/h and touch down at 65-70 km/h. Attempt to alight on all the mainwheels only.

Lighting

The Yak-52 only has wingtip lights, which include an optional strobe. There is no provision for internal lighting so night flying is prohibited.

Please refer to the cockpit section of this manual for information regarding light switch location.

Cockpit

The Yak's cockpit is open and comfortable. The instruments are all metric type except for the altimeter. The arrangement may unfamiliar to Western eyes but this will become second nature after a few flights.

Upper Panel Area :

1. **Accelerometer**. Shows units in 'g'. Max/min needles and reset button are presently not functional (possible sim bug ?).

2. **Warning Annunciators**. The amber 'stalling speed' lamp is useful when landing as it lights at the ideal touchdown speed.

3. **Standby Compass**.

4. **Navigation Lights Switch**.

5. **Airspeed Indicator**. In Kilometers Per Hour (100 km/h = 54 kts).

6. **Attitude Indicator**. The rotary knob on the left adjusts the horizon bar, the push-pull knob on the right is the instrument cage function.

7. **Combined Vertical Speed and Turn/Slip instrument**.

Lower Panel Area :

1. **Engine RPM Indicator**. The needle will read 100% at all but the lowest throttle and prop pitch settings.

2. **Altimeter**. Standard early post-war analogue type with baro setting knob. Calibrated in feet.

3. **Radio Magnetic Indicator**. The numerical disc indicates aircraft heading. The larger yellow needle indicates the direction of the currently tuned NAV1 station relative to the aircraft heading. The smaller ADF needle is currently non-operational (possible sim bug ?).

4. **Engine Multi-Gauge**. Left to right, Fuel Pressure, Oil Temperature, Oil Pressure.

5. **Combined Ammeter / Voltmeter**. The larger needle indicates Main Bus Amps, the smaller one the battery Volts.

6. **Fuel Quantity Indicator**. Each block represents an increment of 5 liters.

7. **Manifold Pressure Gauge**. Calibrated in Kilograms per Centimeter Squared.

8. **Chronometer**. Functions as a simple clock in this model.

9. **Carburetor Air Temperature Gauge**. Currently non-functional (possible sim bug ?).

10. **Cylinder Head Temperature Gauge**.

Left Side Panel :
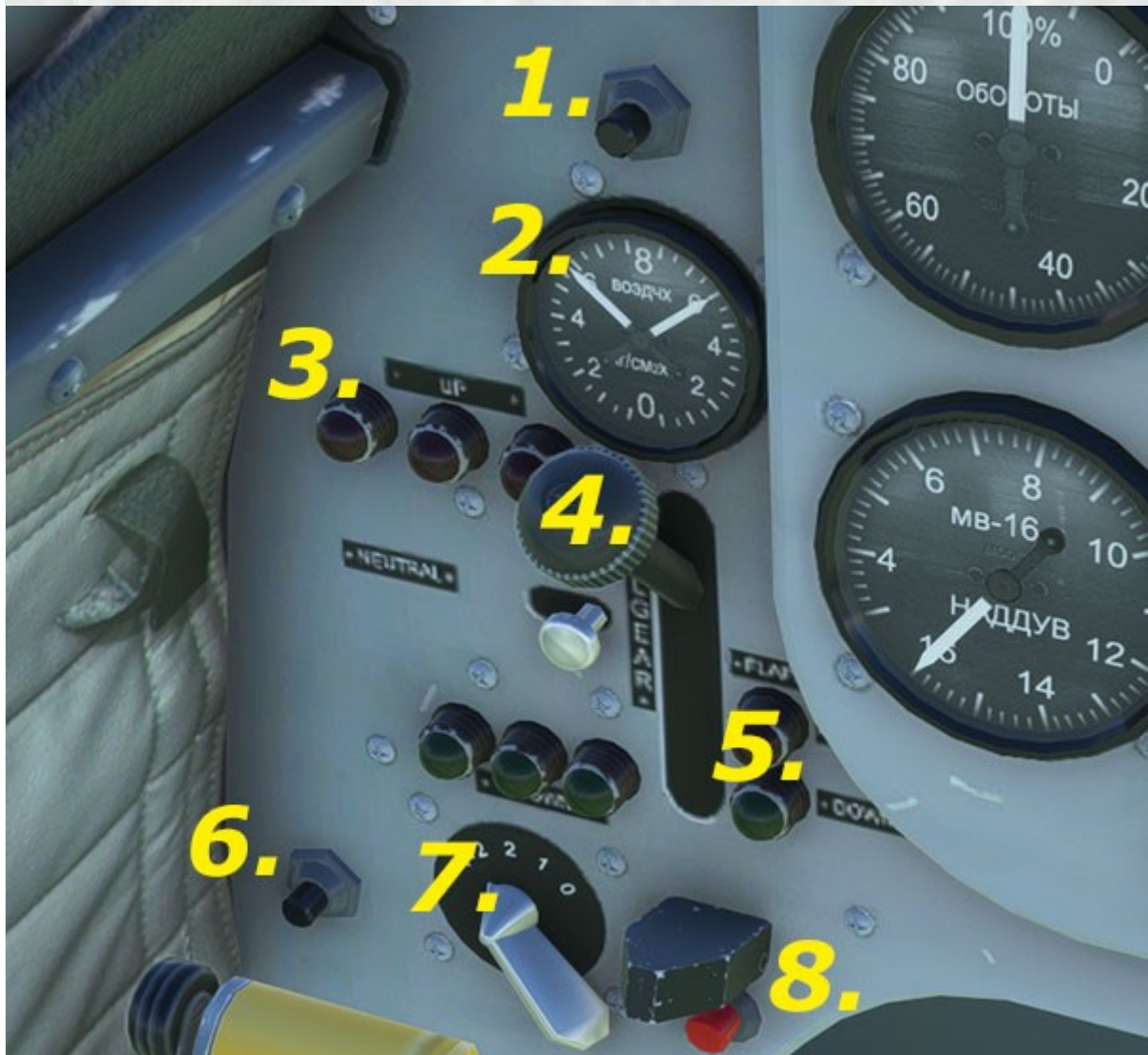
1. **Radios Visibility Switch**. Toggles the pop-up NAVCOM unit.

2. **Brakes Air Pressure Gauge**.

3. **Undercarriage Status Lamps**. The red 'UP' lamps illumiinate when the gear is transitioning. The green 'DN' lamps are only on when the gear is down and locked.

4. **Landing Gear Lever**.

5. **Flaps Warning Lamps**. The red upper lamp comes on only if the landing gear lever is down but no flaps have been set. The red lamp will extinguish and the green will illuminate when flaps have been set, but only if the gear is down, it is otherwise off.

6. **Pilot Figure Visibility Switch**. Use this switch to toggle the pilot figure on or off. There is a separate switch for the rear passenger on the left isde console (see Left Console section below).

7. **Magneto Switch**. Standard 3-position switch.

8. **Engine Starter Button**.

Right Side Panel :
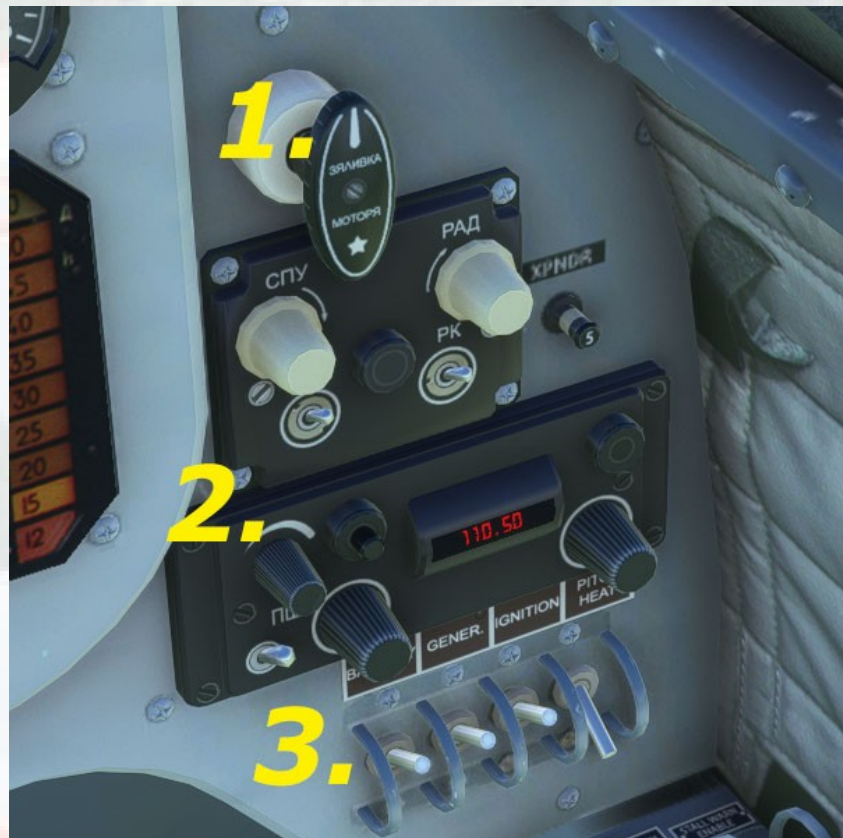
1. **Engine Fuel Primer Handle**.

2. **NAV Radio**. The rotary knobs tune the radio, the silver toggle switch changes the display mode to Standby so the frequency can be adjusted, then set back to Active. The small black pushbutton is the SWAP function, which sets the Standby frequency to the Active.

3. **Electrical System Switches**. Left to right - Master Battery, Generator on/off, Master Ignition, Pitot Heat.

Left Side Console :
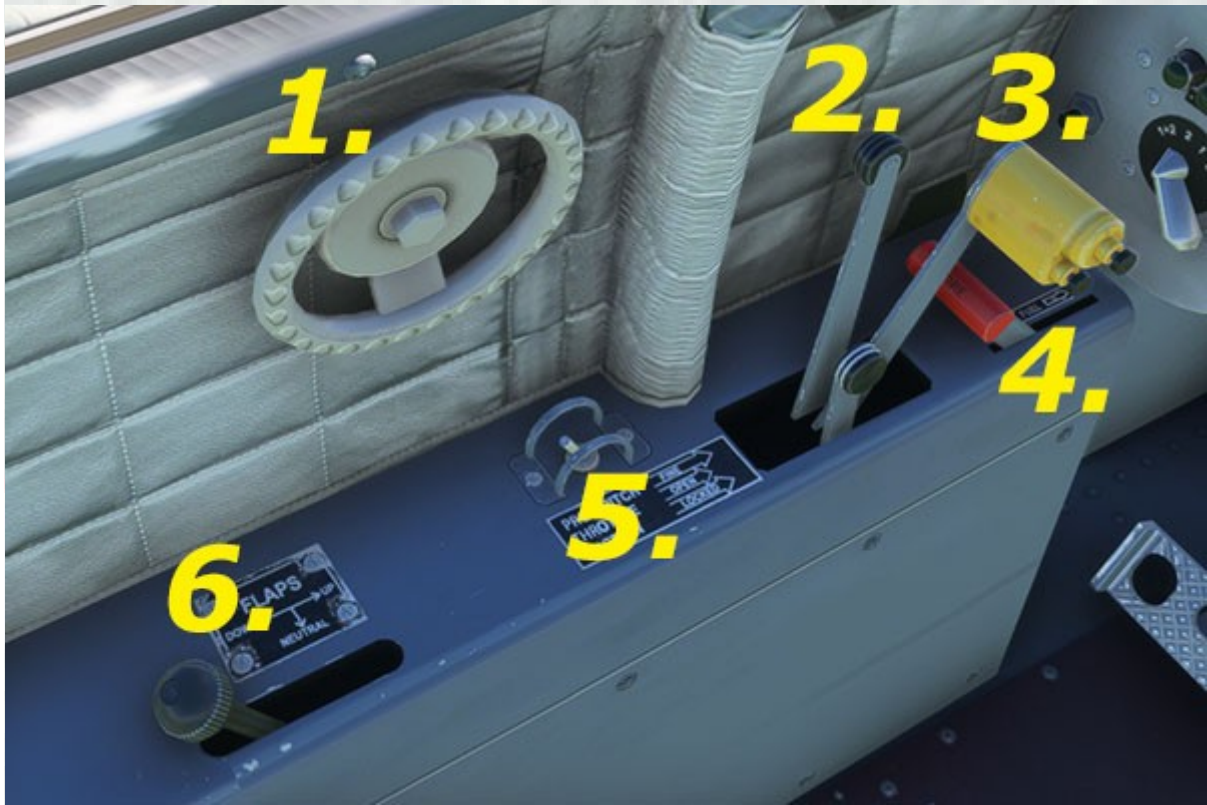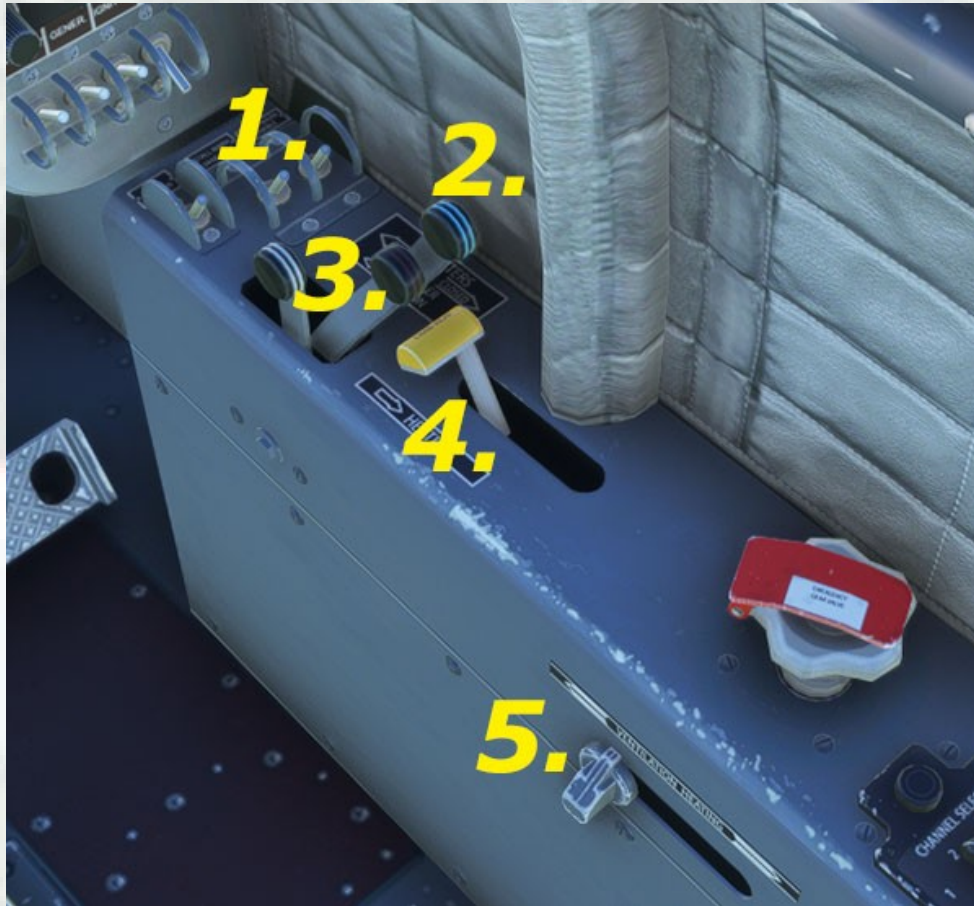

1. **Pitch Trim Wheel**.

2. **Propeller Pitch Lever**.

3. **Throttle Lever**.

4. **Engine Fuel Shutoff Lever**.

5. **Passenger Visibility Switch**. Toggles the rear crew figure on/off.

6. **Flaps Lever**.

Right Side Console :

1. **Electrical System Switches**. Left to right - oil dilution, stall warn vane heat, stall warn enable (no function in simulator).

2. **Oil Cooler Flap Control Lever**.

3. **Cowl Flaps Control Lever**.

4. **Carburetor Heat Control**.

5. **Cabin Ventilation Control**. (No function in simulator).

Pop-Up Radios :

Yak-52 Specifications

Specifications (nominal, clean configuration)

- Engine: Vedeneyev M-14P 9-cylinder air-cooled radial
- Power: 360 h.p. at 3,000 feet
- Maximum speed: 285 km/h, 152 knots ASL
- Cruise speed: 190 km/h, 100 knots at 3,300 feet
- Service ceiling: 13,000 feet
- Range: 550 km, 340 miles
- Wingspan: 9.30 m, 30 ft 6 in.
- Length: 7.75 m, 25 ft 5 in.
- Height: 12.70 m, 8 ft 10 in.
- Wing area: 15 m^2, 161.5 square feet.
- Fuel Capacity: 122 L (32 US Gal., 27 Imp. Gal.)
- Empty Weight: 1,015 kg, 2,238 pounds
- Maximum Weight: 1,305 kg, 2,877 pounds
- Armament: None
- Maximum bombload: None

Speed Limitations

- Full Flaps: 170 km/h, 92 knots
- Landing Gear Extended: 190 km/h, 100 knots
- Never Exceed Speed: 360 km/h, 190 knots
- Stall Speed, Flaps Down: 85 km/h, 46 knots

Yak-52 Procedures

Engine Start

1. Check Parking Brake ON.
2. Turn Battery switch ON.
3. Turn Nav lights ON.
4. Set Throttle Lever to IDLE.
5. Kohlsman - SET.
6. Engine Shutters – OPEN (leave closed in v. cold conditions).
7. Prop Pitch Lever – MAX.
8. Fuel Shutoff Lever – FORWARD.
9. Press Primer Lever 2 times.
10. Turn Magneto Switch to position 2
11. Start Engine – press Starter Button.
12. Generator Switch - ON
13. Pitot Heat Switch – ON, if conditions warrant.
14. Carb Heat Lever – ON, if conditions warrant.
15. Landing Flaps operation CHECK.
16. Altimeter set to ZERO.
17. Fuel Quantity Status CHECK.

Taking Off

1. Set Parking Brake OFF.
2. Strobe Lights – ON (if fitted).
3. Increase throttle to 30% RPM.
4. Test Brakes.
5. Check/Set Flaps at first position.
6. Increase throttle to 50%.
7. Appply 100% power smoothly.
8. At 70 kts, apply back stick and lift off.

After Take- Off

1. Landing Gear RAISE.
2. Pitch Trim ADJUST LEVEL.
3. Landing Flaps RAISE.
4. Engine Power Adjust as required.
5. Engine Shutters OPEN (if closed at take-off).

Approach and Landing

1. Retard throttle to idle.
2. Extend Landing Gear at 190 km/h, 100 kts.
3. Extend Landing Flaps fully at 170 km/h, 92 kts.
4. Apply power to maintain speed to runway threshold.
5. Limit descent rate to 300 fpm.
6. Apply back stick to lose speed at 10 ft.
7. Make 2-point Touchdown at 65-70 km/h, 35-40 kts.

After Landing

1. Retract Landing Flaps.
2. Pitot Heat - OFF.
3. Carb Heat - OFF.
4. Taxy to parking area.
5. Set Parking Brake ON.

Shutdown

1. Throttle - IDLE.
2. Prop Pitch – MIN (lever fully back).
3. Fuel Shutoff Lever – OFF (fully forward).
4. Set Nav Lights to OFF.
5. Magneto Switch – set to Zero.
6. Engine Shutters - CLOSED
7. Generator Switch - OFF
8. Master Battery Switch – OFF.
9. Exit aircraft.