Miltech Simulations U-2

Takeoff and Climb

From the runway to the top of the 160 KIAS climb.

Note
Sim values. Performance values are measured in the sim. They may not accurately represent (nor do they intend to accurately represent) the performance of the real aircraft.

BEFORE TAKEOFF

Stopped on the runway or at the holding point.

1 GEAR PINS AND POGO FLAGS - VERIFY REMOVED With chase-car support enabled, stop on the runway and wait for the front-gear and both pogo technicians to finish and return to the pickup. Confirm the red pogo flags are gone. The crew also removes the emergency-start safety pin. With chase-car support disabled, runway pin removal is automatic.

2 CANOPY SEAL - ON Canopy closed; the cabin only pressurizes with the seal ON → Cabin, Oxygen and Hypoxia

3 OXYGEN - OXY SYS 1 AND 2 ON Oxygen panel, left console; OXY lamp out

4 INS - NAV (N ON THE PFD)

5 CONTINUOUS IGNITION - ON CONTN IGN, lights panel, left side wall

6 SPOILER SWITCH - EMER Lift spoilers run from the accumulator, refilled by the ISS pump → Speedbrakes and Lift Spoilers

7 LANDING SPOILERS - LANDING

8 FLAPS AND GUST CONTROL - FAIRED PFD flap symbol 0

9 CABIN HEAT - AUTO CONTROL SET Inner knob, 55-85 F (70 default) → Cabin, Oxygen and Hypoxia

10 PITCH TRIM - +1.0 NOSE UP PFD trim readout

11 PITCH TRIM MODE - AUTO Right side wall

12 FUEL TOTAL - CHECK SYS/PERF TOTAL, the fuel counter (also in the window of the standby fuel flow gauge), against the planned load. → Fuel System

13 FUEL SUMP - CHECK ABOUT 70 GAL SYS/PERF SUMP

14 WINDSHIELD ANTI-FOG - VERIFY ON

15 MISSION EQUIPMENT - AS REQUIRED

16 ICAW PAGE - CHECK MFD STAT > ICAW

17 LANDING LIGHT - AS REQUIRED LDG LT; it only lights with the gear down

18 IFF - ON, MSTR NORM, MODE 3 CODE AND C CHECKED IFF switch, right console (comes up in standby); UFCD IFF page → Up-Front Control Display (UFCD)

19 PITOT HEAT - AS REQUIRED ON in cloud or precipitation near or below freezing. Standing still with it on for more than about a minute overheats the temperature probe: APCU FAULT until it cools.

20 ENGINE AND FLIGHT INSTRUMENTS - CHECK

Note
Note: In EMER each lift-spoiler deployment uses one accumulator charge (about three when full); the ISS pump refills one in about 4 s. Below 2,500 psi the SPOILERS lamp and SPOILER PRESS LOW show.

Note
Note: Chase car on: once stopped on the runway, hold still and wait for "runway's clear" and "ground crew clear".

TAKEOFF

Lined up on the runway centreline.

NORMAL TAKEOFF

1 THROTTLE - 85 % N2, BRAKES HELD

2 ENGINE INSTRUMENTS AND LIGHTS - CHECK N2, EGT, FF on SYS/PERF or the standby gauges; no MASTER CAUTION

3 BRAKES - RELEASE

4 THROTTLE - FULL Full throttle travel is available in SEC. Expect up to 10 % less thrust.

5 YOKE - PITCH NEUTRAL

6 DIRECTION - TAILWHEEL STEERING AND RUDDER Steering fades out between about 20 and 25 kt, the rudder takes over

7 WINGS - LEVEL WITH AILERON

8 POGOS - LET THEM FALL They drop by airspeed alone - first at 60-76 KIAS, the second usually a few knots later, 88 KIAS at most → Introduction

9 WINGS - LEVEL AFTER THE POGOS DROP

10 PITCH ATTITUDE - SLIGHT TWO-POINT

11 LIFTOFF - 80-110 KIAS By weight

12 AOA TONES - EXPECT THEM 3 S AFTER LIFTOFF Muted on the ground → Angle of Attack (AOA)

13 CLIMB ATTITUDE - SMOOTH

Note
Note: With the safety pins removed, the pogos release automatically during the takeoff roll. If a pinned pogo remains attached in flight, repeated wing rocking can break it free.

CROSSWIND (AS REQUIRED)

14 CROSSWIND - AS REQUIRED Aileron into the wind and rudder for the centreline, full rudder if needed; stop any yaw at once. Out of rudder: dip the downwind wing slightly. After liftoff hold the ground track with rudder and a slight bank into the wind.

NIGHT (AS REQUIRED)

15 NIGHT - AS REQUIRED Same as by day. NAV LIGHTS, ANTI-COLL LTS and LDG LT on; PANEL, INSTRUMENTS and UFCD/SFD light knobs set. Hold the centreline on the runway lights, then fly the PFD attitude into the climb.

AFTER TAKEOFF

Airborne and climbing.

CLIMB-OUT

1 CLIMB SPEED - 160 KIAS Optional PFD L1 A/S bug → Primary Flight Display (PFD)

2 PITCH - SMOOTHLY TO THE CLIMB ATTITUDE

3 THROTTLE - FULL

4 AIRSPEED - BELOW 180 KIAS AIRSPEED lamp and AIRSPEED HIGH from 180 KIAS (230 with gust UP); red line and AIRCRAFT OVERSPEED at 181 (241 gust UP, below 43,000 ft) → Standby Flight Display (SFD)

5 G LOAD - NO PUSHOVER BELOW 1 G Unloaded, the AMAD oil pump uncovers (AMAD, AMAD OIL PRESS LOW)

6 POWER REDUCTION - LOWER THE NOSE GENTLY TO HOLD SPEED

Note
Note: Full power low down can drain the sump faster than it refills. FUEL SUMP LOW or CHECK SUMP QTY in the climb: lower the nose a little, or INBD SUMP TANK ON until the sump is back near 70 gal (FUEL XFER ON, and XFER PRESS LOW while the sump is below 69 gal). → Fuel System

TURBULENT AIR (AS REQUIRED)

7 GUST CONTROL - UP Flaps 6.25 deg up (PFD flap symbol -7) and ailerons 7.5 deg up by themselves in 3-4 s, the nose comes up, flap lever out of use; red line 241 KIAS below 43,000 ft. → Engine Start and Cockpit Controls

8 CLIMB SPEED - HOLD

9 HEAVY TURBULENCE - 120-130 KIAS

10 GUST CONTROL - FAIRED IN SMOOTH AIR

11 AIRSPEED FOR FAIRED - 150 KIAS OR LESS FAIRED above 180 KIAS brings AIRSPEED HIGH and the red line

12 PITCH - EXPECT A TRIM CHANGE WHEN SWITCHING

13 FLAPS - VERIFY 0 ON THE PFD FAIRED takes them back to 0 by itself; if not, GUST CONTROL back to UP

INITIAL CLIMB CHECK

Gear up and settled in the 160 KIAS climb.

1 GEAR - UP, INDICATORS CHECK MAIN and TAIL gear indicators up, gear handle light out

2 ENGINE AND FLIGHT INSTRUMENTS - CHECK No alerts on the MFD alert line

3 LANDING LIGHT - OFF Already dark once the gear left the down position

4 GUST CONTROL - AS REQUIRED

5 MISSION EQUIPMENT - AS REQUIRED MK IV MODE 1-5. SYERS-2A: opens at once, C light about 20 s (Realistic 3 min). OBC: after a good self-test, it photographs from 5,000 ft. ASARS-2: goes to OPER once airborne → Mark IV Camera Panel

18,000 FT CLIMB CHECK

Climbing through 18,000 ft.

1 SPOILER SWITCH - ARM Main hydraulics; the ISS pump stops

2 LANDING SPOILERS - LANDING

3 OXYGEN - CHECK QUANTITY AND PRESSURE LOX quantity gauge (LITERS, beside the gear handle) or SYS/PERF LOX 1 / LOX 2; pressure about 80 psi on the EFB Ground tab; no NO. 1 / NO. 2 OXY → Cabin, Oxygen and Hypoxia

4 CABIN ALTITUDE - ABOUT 7,500 FT SYS/PERF ALTITUDE CABIN 7.5

5 ALTIMETERS - 29.92 ON PFD AND SFD PFD R2 BARO, then R1; SFD: push its baro knob (STD) → Primary Flight Display (PFD)

6 FUEL - CHECK SYS/PERF TOTAL and SUMP

7 MISSION EQUIPMENT - AS REQUIRED

Note
Note: The stall strips are automatic (out from 24 deg flap, in below 20 deg), or on the handle with the EFB option Cockpit handle on Stall strip. STALL STRIP OUT above 18,000 ft with the gear up means they are still out.

52,000 FT CLIMB CHECK

Reaching about 52,000 ft, where the 160 KIAS climb meets Mach .715.

1 CLIMB MACH - .715 PFD Mach readout; hold it with AFCS MACH (CRUISE CLIMB); red line Mach .75

2 NAV AND ANTI-COLLISION LIGHTS - OFF

3 OXYGEN - CHECK QUANTITY AND PRESSURE

4 CABIN ALTITUDE - ABOUT 25,000 FT SYS/PERF ALTITUDE CABIN about 25

5 SUMP BUG - 65 GAL SYS/PERF L4 EDIT, L6 (65), L3 EXIT; CHECK SUMP QTY then means the inboard tanks are empty → Fuel System

Caution
Caution: On SYS/PERF, L6 pressed outside EDIT opens the LOAD 500 prompt - answer NO (L6).

6 FUEL - CHECK

7 PITOT HEAT - OFF

8 GUST CONTROL - FAIRED

9 MISSION EQUIPMENT - AS REQUIRED

Related pages: Flying the U-2S · U2 101 - The Basics · Cruise

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